RISKGOV EUROPEAN PROJECT

COMPARATIVE ANALYSIS OF RISK GOVERNANCE FOR RADIOLOGICAL AND CHEMICAL DISCHARGES OF INDUSTRIAL INSTALLATIONS

FINAL REPORT

ANNEX 2 – FULL CASE STUDIES

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INTRODUCTION

The objective of the RISKGOV Project is to analyse and identify quality criteria for the governance of industrial activities giving rise to risks to people and the environment from radioactive and chemical discharges during normal operations. For this purpose, RISKGOV aims at: 1) analysing and comparing the elements contributing to the quality of governance systems associated with environmental discharges from nuclear and chemical installations; 2) providing a series of criteria to assess the quality of the governance of risk activities.

In total, 8 case studies were conducted, covering radioactive and chemical releases related to local and international contexts and referring to innovative risk governance processes in France, Sweden and the United Kingdom:

- The role of local liaison committees with regard to the management of discharges of installations:
  - France: Local liaison committee of the Gravelines Nuclear Power Plant
  - Sweden: Local liaison committees of the Barsebäck Nuclear Power Plant and the Rohm and Hass Chemical installation

- The dialogue process during the preparation of reauthorisation of radioactive discharges:
  - France: COGEMA-La Hague facility
  - United-Kingdom: Devonport Royal Dockyard

- The dialogue process in a regional context:
  - France: Management of air quality around the industrial site of Etang de Berre

- The dialogue process in an international context:
  - Implementation of the OSPAR Convention for chemical and radioactive releases
  - The abandonment of the Brent Spar offshore platform

The analysis was performed by a multidisciplinary research team and based notably on interviews with key stakeholders directly involved in these innovative risk governance processes. The following dimensions were addressed: a) The guiding principles of the decision-making process; b) The role of expertise; c) The stakeholders involvement process; d) The factors integrated into the decision-framing and decision-taking processes; e) The implementation of decisions and their review. The complete analysis framework is presented in Appendix 1.

This Annex to the final RISKGOV report presents the full case studies. The summary of the case studies is presented in the Annex 1.

CASE STUDIES CONCERNING THE ROLE OF LOCAL LIAISON COMMITTEES WITH REGARD TO THE MANAGEMENT OF DISCHARGES OF INSTALLATIONS

A. CONTROL OF RADIOACTIVE DISCHARGES AROUND THE GRAVELINES NUCLEAR POWER PLANT BY THE LOCAL COMMISSION OF INFORMATION IN FRANCE

1. INTRODUCTION

The area located around the Dunkirk harbour is historically highly industrialised. Within 400 km^2, 18 chemical plants, 13 iron and steel metallurgy plants and 13 farm-produce plants are concentrated[1]. The Nuclear Power Plant (NPP) is located in the city of Gravelines, which is situated on the coast, close to the Dunkirk harbour.

The six 900 MW reactors of this NPP produce between 9% and 10% of France's nuclear energy production. The plant can generate enough electricity to supply the entire Nord-Pas-de-Calais region, where demand is very high due to important industrial consumers. Coolant for the secondary system is provided by seawater from the western outer harbour of Dunkirk that is one kilometre far from the plant. A sea fish farm upstream from the power station uses some of the warm water to produce an annual output of 6 million bass and 1.5 million bream.

The key risk governance process concerning the NPP and involving different categories of stakeholders is the Local Commission for Information (CLI). This document aims at describing the functioning of the CLI of the Gravelines NPP.

2. BACKGROUND AND CONTEXT

2.1. Local historical context

At the beginning of the 1970ies, the decision to build a thermic power plant in the area of Dunkirk was taken. This power station was a necessity to provide electricity to the many industries (oil refineries, chemical plants, steel metallurgy plant…) established in this area. The proximity of the Dunkirk harbour also made it easy to provide fossil fuel for the electricity generation. The site of Gravelines was selected. But with the oil crisis, the plans were reviewed and it was decided to build a NPP. Within a spread climate of contesting against nuclear energy, it led to an important opposition move.

Nevertheless, the building of a NPP in Gravelines started in 1974 and ended in 1980. The reactors started operating between 1980 and 1985. Considering the persisting conflicting climate, the mayor of Gravelines, Albert Danvers, initiated the creation of a Local Commission for Information (CLI) in order to show that nuclear industry had

[1] 400,000 people live in this area and 9 industries concerned by the SEVESO directive are located here.

nothing to hide and was not less safe than other kinds of industry. The CLI was officially created in 1987, December the 2nd by the General Council of the Department (Nord) in order to meet the needs expressed by the citizens for clear, accurate and complete information on the site. Its members were nominated by a Departmental decree.

At the same time, the need to create a structure allowing the different stakeholders to debate on the global management of polluting industries was emerging. In fact, in 1989, local elected people, taking into account the need to stimulate the regional economy, decided to favour the set up of new industrial activities and they wanted to make sure that local actors would be able to give their advice on those activities. Environmental impacts associated with those new activities would have to be closely followed and mastered.

This led to the creation of a Permanent Secretary for Industrial Pollution Prevention (SPPPI) composed by representatives of the Chamber of Trade and Industry, local NGOs, public authority and local elected people. Most of the people involved in the CLI are also involved in the SPPPI. The works carried out within the SPPPI cover a large panel of activities: epidemiological studies, air and water pollution survey, industrial rubbishes, risk management… The SPPPI appears for its participants as a remarkable tool to discuss freely and in a transparent way on the very complex problems raised by the presence of many SEVESO industries. This dialog allows the emergence of priorities, which take into account the local context contrary to the national regulations.

2.2. Political and legal context

The question of the access to information as well as the existence of a dialogue forum around the NPPs is a key feature since the development of the nuclear policy energy in France in the middle 1970ies. In response to a strong local contesting, the first structure aiming at providing such a dialogue forum was created around the Fessenheim NPP in 1977. The goals of this Local Commission of Survey are the diffusion of information and the survey of the NPP functioning.

Nevertheless, there was no framework neither obligation for the creation of such a structure around the NPPs. In this context, the French Prime Minister, Pierre Mauroy, wrote a circular describing the key characteristics of a Local Commission for Information (December 15th, 1981). This text applies to all power plants (not only nuclear ones), but the creation of a CLI is not an obligation: the decision is taken by the General Council together with local elected people[2].

Local elected people (at least half of the seats), Trade Union and environmental NGOs representatives and "recognized personalities" compose the CLI. Its role is both information of the population and survey of the impacts associated with the power plant. The commission can access to all the information, studies or regulatory

[2] The creation of a CLI is, nevertheless, strongly supported for nuclear power plants.

prescriptions that concern the power plant (except industrial and commercial secrets). Local communities that benefit from the activity of the power plant should financially support the commission.

The circular also outlines the needs for a national coordination of the existing CLI to improve information circulation, experience exchanges and dialog with the Government. In January 1999, the National Nuclear Safety Authority (ASN) created a national network of the CLI (named ANCLI), aiming at developing a national feed back between the different CLI. The ASN also strongly supports the creation of CLI and can contribute to their funding, notably regarding the development of specific actions such as expert studies.

Nevertheless, the circular does not define clear legal statutes for the CLI. This is of major concern today in most of the CLI as it is for example not possible for the CLI to hire someone (see chapter 4) without given a specific legal statute to the CLI.

3. PRESENTATION OF THE PARTICIPANTS AND RESOURCES OF THE RISK GOVERNANCE PROCESS

3.1. The dialog structure

The CLI, which has no legal statutes, is funded by local communities (mainly Gravelines, Dunkirk and the Department) and the Regional Directorate on Industry, Research and Environment (DRIRE). Its budget is about 35 k€. Thierry Dubuis (employed by the DRIRE, but neither in charge of inspecting the Gravelines NPP facilities nor industrial installations) assumes the animation and the secretary of the CLI, which has been chaired by Jean-Claude Delalonde (elected at the Departmental Assembly) since 1998.

3.1.1. Organisation

The CLI has more than one hundred of official members (local elected people, public authority representatives, local NGOs, Trade Union representatives, operator, medical authority representatives) named by a Decree of the Departmental Assembly, but only 20 people take part regularly to its activities.

In order to improve the quality of its work, the CLI created two sub-commissions in April 1996:

- A technical sub-commission in charge of the technical aspects of the plants functioning, i.e. incidents or discharges monitoring for example. This sub-commission played a major role in the creation of a radiological monitoring network around the power station independent of the others (which are managed by the operator and the authority).

- A "population safety" sub-commission whose activities deal with the protection of the population and the management of nuclear accident situation. It works, for example, on the preventive distribution of iodine pastilles.

3.1.2. Activities

2 or 3 plenary sessions are organized each year. General subjects and results of the works carried out by the two sub-commissions are presented. Journalists are invited to those meetings. The technical sub-commission meets 3 or 4 times a year to debate on new projects, incidents, discharges into the environment… Furthermore, visits of nuclear installations are organised according to the concern of the CLI. The population safety sub-commission meets 2 or 3 times a year, mainly to discuss on safety in case of a nuclear accident.

Those meetings and visits are a way for the various participants to get reliable information on various topics, such as the evolution of the regulations. EDF presents its annual feed back report and its prospects, strategy every year. The DRIRE presents the results of its inspections. Noticeable events occurring in other nuclear plants are also discussed.

The CLI publishes regularly (3 times per year) a news bulletin (OPALE) and send it to inhabitants living close the power plant (100,000 copies).

Other information sheets are available, notably:

- A letter to the local elected people written down by EDF, which provides basic data on nuclear energy…
- The power plant environmental monthly report.

The presence of journalists during the plenary sessions is also a way to provide information to the general public.

In addition, members of the CLI participate as observers to inspections carried out by the DRIRE. They take part to sampling campaigns and if need be, they can also ask for experts judgement. Several visits have been organised: Brenillis (to discuss on nuclear plants dismantling), Cherbourg (to visit the IRSN laboratory in charge of La Hague environmental survey)…

The Gravelines CLI is involved in the National Association of CLI (ANCLI) and Jean-Claude Delalonde participates to the national meeting of the CLI presidents, event that is strongly supported by the National Nuclear Safety Authority.

3.2. The actors interviewed

Within our study, we met 6 people reflecting the composition of the CLI.

Two local elected representatives were interviewed. Jean-Claude Delalonde was elected at the Departmental Assembly in 1998. Rather interested by the CLI, he expressed his wish to lead the commission and became its president. Bertrand Ringot was elected mayor of Gravelines in 2001 and, as a consequence, became a member of the commission.

Jo Dairin is the president of the Chamber of Trade and Industry of Dunkirk. He is vice-President of the CLI, in charge of the technical sub-commission.

Jean Sename, former journalist, is the president of the Assembly for the Defence of the Littoral Flandres Artois (ADELFA), which gathers 33 NGOs of the Nord-Pas-de-Calais district. The activities of those NGOs cover many items (environment, historical patrimony or consumer protection…). 2 representatives of ADELFA take part to the work carried out by the CLI.

Guy Catrix, EDF, is responsible for the safety quality of the nuclear power plant of Gravelines. He is involved in the activities of the CLI.

Thierry Dubuis (detached from the Regional Directorate on Industry, Research and Environment - DRIRE) is in charge of the secretary of the CLI. In the same time, he is responsible for the animation of the SPPPI. As mentioned above, Thierry Dubuis is not in charge of inspecting installations.

4. DESCRIPTION OF RISK GOVERNANCE PROCESS

The following paragraphs present the main issues at stake and actions performed in the CLI. This presentation includes the point of view of the interviewed stakeholders while the synthesis of interviews is presented in Annex.

4.1. Point of view of the stakeholders on the working of the CLI

4.1.1. Functioning of the CLI

A rather important evolution in the functioning of the CLI is the recent change of secretary. So far, this task was ensured by DRIRE representatives who were also responsible for the Gravelines NPP inspections, which leads somehow to a lack of transparency: the animator of a debate dealing mainly with the safety of the NPP facilities was also in charge of the regulatory inspections of those facilities. The new secretary, Thierry Dubuis, is employed by the DRIRE, but he plays no role in the facilities inspections (he is also responsible for the secretary of the SPPPI). Nowadays, the inspectorate of the DRIRE in charge of the Gravelines NPP participates to the work of the CLI in addition to Thierry Dubuis.

The 1981's Mauroy circular does not provide a legal statute for the CLI. According to the interviewed actors, it clearly leads to two problems:

- As explained by Jean-Claude Delalonde and Thierry Dubuis, the CLI cannot hire someone, even if it is a real concern to favour the implementation of the decisions taken during the meetings of the CLI and the durability of the structure. Furthermore, the secretary could be assumed by someone who is not attached, directly, to the public authority, which would improve the transparency of the CLI.
- The direct funding of the CLI is not possible without a legal statute. So far, the Urban Community of Dunkirk (CUD) or the DRIRE pay the various bills.

4.1.2. Quality of the dialogue

Jean Sename (ADELFA) thinks that the CLI "works rather well". It provides him the possibility:

- *To detail clearly the position of its NGO on various topics dealing with the NPP,*
- *To question the operator.*

The representatives of ADELFA receive the agenda before each meeting of the CLI. They have enough time to think it over and to find information on the subjects tackled, which allows them to ask judicious questions to the other stakeholders. Nevertheless, Jean Sename, who is in favour of a transparent dialog on nuclear energy, wonders why the Trade Union representatives do not participate to the CLI. He also regrets the lack of involvement of local representatives during the meetings.

Guy Catrix explains that the CLI makes it possible for EDF to illustrate its transparency policy. This is feasible because some members of the CLI know well the nuclear facilities of Gravelines (they have followed it for a long time), which allows engaging constructive discussions. As a consequence, Guy Catrix feels that the opening of the CLI to new participants could alter the quality of the debate and its transparency. Jean-Claude Delalonde and Jo Dairin estimate too that there is a climate of confidence between the actors within the CLI.

According to Thierry Dubuis, the debate held in the CLI highlights the absence of complicity between the public authority and the operator. This is particularly outlined during the presentation led by the DRIRE of the results (favourable or not) of the inspections of the NPP.

Both Thierry Dubuis and Jean-Claude Delalonde appreciate the division of the CLI into two sub-commissions whose works are presented together during the general assemblies. It contributes to the efficiency of the CLI because it allows focusing on specific topics, and it favours an in depth discussion as well as a follow-up of the technical issues.

The quality of the dialogue has also improved since the members of the CLI have the possibility to attend the DRIRE inspections and to visit the NPP.

4.1.3. Diffusion of information

The CLI publishes three issues per year of its information bulletin OPALE. Approximately 80 000 specimens are distributed around the Gravelines NPP (Districts of Bergues, Audruicq, Wormhout, Large-Synthe, Gravelines, Bourbourg and Dunkirk West). Unfortunately, due to economic reasons, extending the diffusion of OPALE seems currently difficult, although Jean-Claude Delalonde would be in favour of a larger diffusion due to the feedback he got from the population on this bulletin.

OPALE deals with subjects covered during the last general assembly of the CLI. It aims at presenting the points of view of the different stakeholders. But Jean Sename thinks that this bulletin mainly expresses the point of view of the operator: he regrets the lack of contradiction in the articles of the bulletin. Jo Dairin, who notices the absence of a pluralistic vision of the debates, confirms this. However, Jean Sename underlines that more and more efforts are made to integrate the various opinions.

The SPPPI, together with EDF, took part to the diffusion of information in the schools of the Region. There is currently a will to have common actions between the CLI and the SPPPI on this topic.

4.1.4. Difficulties encountered in the risk governance process

Although the debate between the stakeholders seems rather effective inside and outside the CLI, few difficulties have been expressed during the interviews.

Recently, a paper was published in the newspaper "La Voix du Nord". In this article, the author severely criticised the "bad results" of the NPP in terms of occupational exposures and nuclear safety, according to the annual results presented by the inspector of the DRIRE. Few days before the publication of the paper, the same results were presented to the CLI with a different appreciation from members of the CLI. This situation led to a strong reaction from the President and Vice-Presidents of the CLI as well as the Mayor of Gravelines, questionning the presentation of the DRIRE in the two different arenas. A letter was sent to the newspaper on behalf of the CLI. This event was also at the origin of another reaction from Jean Sename, regretting the lack of communication between the President and the vice-Presidents and the other members of the CLI. This letter on behalf of the CLI defends the operator results while the adoption of this position was not discussed with the other members of the CLI.

Furthermore, Jean Sename does not understand why the members of the CLI were not officially invited to the last crisis exercise organised by the public authority for the Gravelines NPP. He had to contact the public authority representative to attend to this exercise.

He also estimates that the communication between the CLIs in France could be improved. He thinks that it would be interesting for example to share with the other concerned CLIs the results of the technical sub-commission reflection on "What is envisaged to avoid the problems that would result from an oil slick?" (see § 4.2.1). The technical solution that results from this reflection initiated by ADELFA representatives could be implement by all the coastal sites.

4.2. Actions carried out

4.2.1. The risk of oil pollution

With the multiplication of accidents leading to oil slick during the latest year (The Erika, 1999, The Prestige, 2002) and the recent wreck of the Tricolor (December 2002), ten kilometres far from the northern French coasts and close to the Gravelines NPP, there had more and more questionings about what would be the impact(s) associated with an oil slick on the Gravelines NPP operation.

ADELFA representatives addressed the topic to the operator during a meeting of the technical sub-commission. The latter ones recognized that such an event could lead to a temporary stopping of the operation and possibly to serious dysfunctions in the electricity distribution over the complete Country. The operator's representatives committed to finding an effective answer to this worry. Several technical solutions were envisaged and exposed to the CLI members. Different discussions and exchanges between EDF experts and members of the CLI led EDF to progressively define a solution which should be definitively implemented in the coming months in Gravelines and, maybe, in the other French coastal NPPs. Both interviewed actors recognised the key role of ADELFA representatives in this specific debate.

Guy Catrix outlines that this topic is a clear example on how the debate organized within the CLI can influence the way the operator treats its technical priorities.

4.2.2. Detection of plutonium traces around the Gravelines NPP

In 1999, the Ionising Radiation Protection Agency (OPRI), in charge of the surveillance of environment around the nuclear installations, detected plutonium traces in the sediment close to the Gravelines' NPP. During a meeting of the CLI, the question of whether or not the plutonium had been discharged from the NPP was raised. In the interview, Jean Sename explained that the NPP's Director firmly denied this possibility. However, the members of the CLI asked for complementary measurements in order to find the origin of the plutonium and they also decided to take part to the sampling campaign.

The results of this action showed that the plutonium came from the reprocessing plants of La Hague and Sellafield. In spite of those results, Jean Sename believes it is possible that a small amount of the plutonium came from the NPP. Furthermore, he is concerned by the "plutonium accumulation".

In order to go further, Jo Dairin favoured the organisation of a visit to the IRSN laboratory in Cherbourg, with the financial support of EDF, to better understand the monitoring of the radioactive concentration in the environment.. This event illustrates that the CLI is not only an information vector, but has also a role to play in the survey of the NPP.

4.2.3. Rubber balls found on the seaside

In 2000, thousands of rubber balls were discovered on the beach, close to the NPP. There was a real concern of the local population on the possible radioactive contamination coming from this pollution on the beach. Therefore, the members of the CLI asked for information and explanations from EDF. They also requested to EDF a planning for actions in order to avoid such a situation in the future.

In this context, the operator had to provide the reasons of this event during a meeting of the CLI. Those balls are used to clean the condensers (not the activated part of the condensers). There was no radiological pollution. The incident was associated with a dysfunction of a mechanical system that led to the discharge of tens of thousands of rubber balls.

The operator representatives promised to the members of the CLI they would improve the mechanical system in order to avoid this visual disagreement.

This issue was followed by the CLI in order to get enough guarantees on the situation from EDF and then to be able to disseminate to a larger public the information on the situation and the actions adopted by EDF.

This example, as the previous one, illustrates the continuous vigilance exerted by the CLI on the operator.

4.3. Envisaged evolution of the CLI

4.3.1. Structure and legal statute

The questioning of the stakeholders about the "future" of the CLI mainly deals with its legal statute. Guy Catrix thinks that the creation of a legal statute for the CLI should clarify the roles of each stakeholder.

Thierry Dubuis sees several possible synergies between the CLI and the SPPPI: the secretary, the location, the diffusion of information. To him, it is necessary to explore those synergies in order to improve the quality and the efficiency of the works carried out by those structures (and, possibly, to save money).

Jean-Claude Delalonde is waiting for new laws providing a legal statute to the CLI. In that respect, he explains that the CLIs' National Association (ANCLI) is a place where it is possible to share his ideas and worries at a higher decisional level. He can argue

for the need to get new funding or a clear legal statute with both representative of the National Nuclear Safety Authority and the other Presidents of CLI.

Jean-Claude Delalonde thinks that the CLI and the SPPPI must remain independent. He particularly underlines the importance of the CLI to maintain vigilance on Gravelines NPP activities and to envisage the future of those facilities, which are getting older and older. He also expects that EDF will pursue its efforts, for example by proposing visits of its facilities or by providing a location for the future meetings of the CLI.
The financing of the CLIs

Jean-Claude Delalonde would like to build a durable structure. He wish the CLI got a legal statute so that it would be possible to have permanent employees working permanently for the CLI with a sizeable budget. There is, as a consequence, a need to find more money for the CLI from local communities, ASN… With a larger budget, the quality of the information provided to the public or, at least, the area of diffusion of the bulletin OPALE could be improved.

Furthermore, the main part of the money used to finance the CLI comes from the Departmental Assembly and the National Funds of the CLI. This money is managed by the DRIRE, which meets some administrative difficulties to deliver it to the Commission. The acquisition of a legal statute would clearly simplify this procedure.

5. PRELIMINARY ANALYSIS OF THE RISK GOVERNANCE PROCESS

5.1. On the statutes and the financial resources of the CLI

The focus on the definition of a legal statute as well as dedicated resources for the CLI reveals a real will from all its members to get a perennial structure in order to favour the access to and the dissemination of the information concerning the surveillance of the NPP. This will also give the opportunity to better identify the potential resources for the CLI.

There is a need for the members of the CLI to get an official and legal existence, acknowledged by all persons and institutions, and that can be used, referred or even “opposable” to people and institutions when necessary for improving the actions and efficiency of the CLI.

There is a will to find a solution at the national level, instead of the local level, for the statute of the CLI. It appears to be a condition to reinforce the credibility and visibility of the CLI. In that respect, the National Association of the CLIs plays a key role in negotiating the question with the Ministries and in allowing a networking of the CLIs.

Furthermore, this context also favours the definition of the “running conditions” of the CLI, notably the right and duties of each member and the circulation of the information inside and outside as well as the decision making process adopted for the official position of the CLI. Therefore, this is not an “informal” risk governance process.

5.2. Information and expertise

Members of the CLI are in position to seek for understanding the situation and the key issues with regard to the surveillance of the NPP, without a will to become themselves experts as the “traditional” ones (public and operator experts).

The role of these members is rather to analyse regularly the data and information and ask for additional measurements or explanations if necessary.

For achieving their tasks, they use the results of different expertises, collected through local and national networks as well as coming from public experts.

These local actors are in a vigilant position, taking care that questions are asked to the operator, either by the public authority or by themselves. They are in a position of questioning the management of the safety and radioactive discharges by the operator. They can request further explanations as well as criticize the choice of the operator with regard to prevention. At the same time, they are the intermediate with the local population in order to question the operator and to transfer the information to the local population.

For improving their understanding, confidence and capacity to question the choices of the operator, the participation of members of the CLI to the inspections of the DRIRE at the NPP is a key action.

Although the members of the CLI do not consider themselves as experts, they wish that their concerns were taken into account in the management of the NPP prevention, both by the operator and the public authority.

The questioning of the members of the CLI allows on one hand to put on the table and to anticipate the management of potential events (e.g. the risk of oil pollution), and on the other hand to have a prospective vision (e.g. the will to take into account the consequences of the ageing of the installation).

5.3. Acting in the context of an environmental protection concern

Most of the members of the CLI are also involved in different local and regional organisations or risk governance process dealing with the protection of the environment and/or the industrial development. Generally, they are not focussed on nuclear energy. They are involved in the SPPPI, in organisations dealing with the quality of living conditions in the region…

There is a will of the members of the CLI to be associated with the organisation of the vigilance in the region as far as environment and industry is concerned, but keeping at the same time a specific risk governance process for the NPP in order to avoid a larger forum not able to tackle specific questions for the surveillance of the NPP. For example, the question of the evolution of the prevention with regard to ageing installations seems to be specific to the nuclear facilities.

5.4. The position of the operator in the risk governance process

It is clearly acknowledged by the operator that the members of the CLI are key interlocutors as far as the management of safety and radiation protection is concerned. In this context, it is of prime importance for the operator to quickly and correctly informs them in order to demonstrate its transparency. Beyond the issue of transparency, the operator has to listen to the requests and questions expressed by the members of the CLI, as well as to take into account their proposals for the implementation of protection options.

Nevertheless, the members of the CLI do not accept a direct financial support from the operator for the functioning of the CLI. The financial support from the operator is rather devoted to additional actions for getting information, such as the payments of travels for visiting nuclear installations, as well as to facilitate their organisation.

5.5. A climate of confidence favourable to the efficiency of the CLI

The climate of confidence developed among the stakeholders involved in the CLI allows depth discussion and a common work (each member having his own role). This climate of confidence does not mean a single point of view on the topics and issues at stake. Each member has to keep his autonomy and point of view. Although strong and divergent positions on specific subjects may create temporarily a climate of conflicts, the conditions for the dialogue still exist and a common work is still possible according to the mutual respect which exists between the members of the CLI.

This climate of confidence, acknowledged by most of the members of the CLI, has progressively emerged between them, essentially during the latest years which followed the openness in terms of membership as well as in terms of organisation of the work.

ANNEX A1 SYNTHESIS OF THE INTERVIEWS

Jean Sename, President of ADELFA

The Assembly for the Defence of the Flandres Artois Littoral (ADELFA) gathers 33 NGOs of the Nord-Pas-de-Calais administrative region. The activities of those NGOs cover many items as environment, historical patrimony or consumer defence. The executive office is composed of seven members. One representative of each NGO attends the general assembly.

ADELFA takes part to the activities of the SPPPI and the CLI. It also coordinates a study on the incidence of pollution on human health at the regional level.

Two ADELFA representatives take part to the meetings organized by the CLI. Before one meeting, they receive the agenda. They have time to think it over and to find information on the subjects tackled, so that they can ask judicious questions to the other stakeholders. The contribution of ADELFA is not negligible: as a matter of fact the ADELFA recently highlights a technical problem relating to risk prevention in case of oil slick. The representatives of EDF recognized that this problem had to be studied in more details. Different technical options have been presented by EDF to the CLI. Jean Sename expects that the solution adopted by EDF for the Gravelines NPP will be implemented to the other French coastal nuclear power plants.

Jean Sename recognised the efforts carried out by EDF to improve the transparency of its activity during the latest years. He thinks the CLI "works rather well" but he regrets that local elected people seem poorly interested by the debate.

Jean Sename also regrets the poor information circulation within the CLI. Moreover, he does not understand why the CLI members were not invited to participate to the last crisis exercise that took place in Gravelines. He had to take contact with the public authority to attend this exercise.

In addition, Jean Sename feels that the information bulletin OPALE mainly expresses the point of view of the operator, although improvements have been made recently.

Jean Sename wonders why Trade Union representatives do not participate to the CLI. They may see the CLI members as opponents to nuclear energy.

The relationships between the CLIs are theoretically ensured by the ANCLI. Nevertheless, ADELFA has also informal exchanges with the different CLIs allowing new interrogations to be raised. Furthermore, Jean Sename does not hesitate to contact directly the public authority at the local or national level, to get information and documents.

Bertrand Ringot, Mayor of Gravelines

Bertrand Ringot was elected mayor of Gravelines in 2001. He explains that he building of the Gravelines NPP was closely followed by a massive arrival of workers in the city and its surroundings, and thus modified the life of the city. Gravelines counts lots of residences of EDF. Nuclear industry together with other industries contributed to the high level of employment in the district.

Bertrand Ringot underlines that people feel confident. The current information seems to be enough for the public concerning the nuclear power plant.

He does not participate himself to all the meetings of the CLI but he is represented by the elected people in charge of the environment and the person responsible in the city administration of environment and risk management.

Thierry Dubuis, DRIRE Nord-Pas de Calais. Responsible of the animation of the SPPPI Côte d'Opale-Flandres and the CLI

Thierry Dubuis explains that the 1981's Mauroy circular does not provide a legal statute for the CLI. One of the major problems is therefore the impossibility for the CLI to hire someone even if it is really desirable to implement the decisions and orientations taken during the meetings of the CLI. Thierry Dubuis wishes he could set up a self-governing structure covering both functions of the CLI and the SPPPI, with separate mandates if necessary. He would appreciate to lead common actions between the CLI and the SPPPI as far as common issues exist.

Thierry Dubuis thinks that the CLI raises new issues for the operator. For example, the debate that followed the shipwreck of the "Tricolor" revealed the risks for the NPP operating associated with oil slicks. Under the pressure of the CLI members (mainly Jean Sename), EDF launched a specific study to find technical solutions and were presented and discussed the results during the meetings of the CLI.

The members of the CLI are very interested in attending the inspections carried out by the DRIRE. It seems to improve the quality of the exchanges between the different stakeholders and the representatives of EDF. Moreover, it highlights the absence of "complicity" between the DRIRE and EDF.

Guy Catrix, Chief of the mission safety quality of nuclear power plant of Gravelines

According to Guy Catrix, the CLI is a place that makes it possible for EDF to illustrate its transparency policy. It is feasible because some members of the CLI know the NPP facilities and have followed them for a long time, which allows engaging constructive discussion on the safety and radiation protection.

The CLI can have a large influence on which technical issues will be treated proprietary by the operator. For example, the questionings of Jean Sename on the risks

associated with an oil slick encouraged EDF to react quickly and to find technical solutions. Members of theCLI, notably a representative of NGO, also had the opportunity to visit the NPP facilities.

Guy Catrix explains that the National Authority for Nuclear Safety is responsible for the control of the nuclear facilities, and therefore the CLI should not ask to an other expert its advice on the way the NPP works.

Guy Catrix thinks that the creation of a legal statute for the CLI must be clear on the roles of each stakeholder. He explains that the opening of the CLI to new participants could decrease the quality of the debates and so its transparency.

He notices that it is important to keep the current way of functioning of the CLI: the sub-commissions which offer more place for the debate and the general assembly which somehow provides a calendar of the actions that have to be carried out.

Jo Dairin, vice-President of the CLI, in charge of the technical sub-commission

Jo Dairin explains that the members of the CLI really take part to the survey of the NPP facilities. They participate, as observers, to the inspections carried out by the DRIRE inspectors and they organize a sampling campaign in 1999 when plutonium traces were discovered. This action was significant for the CLI as far as detailed information and explanations were requested in order to get guarantees on the origins of the plutonium and its possible consequences. On this respect, he favoured the organisation of a visit to the IRSN laboratory in Cherbourg to better understand the monitoring of the radioactive concentration in the environment.

Furthermore, an independent (from the operator and the public authority ones) analysis network (250 k€) was created within the CLI in order to extend the surveyed area.

The members of the CLI are rather vigilant and Jo Dairin recognizes that there is a real confidence between the stakeholders. But when an incident occurs, they do not hesitate to ask questions, to claim for detailed explanations and, why not, to ask for a complementary expertise.

Jo Dairin appreciates that the CLI broadens its ideas to a larger time and space vision, in order to better understand what is going on at Gravelines NPP and, more generally, in the nuclear industry. Thus, the members of the CLI visited COGEMA Cherbourg facilities in 2000 and Brennilis in 2002 to better understand the EDF dismantling policy.

Jean-Claude Delalonde, President of the CLI

Jean-Claude Delalonde estimates that there is a climate of confidence within the CLI. It does not mean that the members of the CLI support nuclear energy, but the CLI offers the possibility to debate freely together with the other stakeholders on many topics.

He thinks that the most interesting exchanges occur during the sub-commissions' meetings. The general assembly allows a feedback of the work carried out by those sub-commissions. It seems important for Jean-Claude Delalonde to preserve this way of functioning and to open the general assembly to the media.

Jean-Claude Delalonde does not support a "fusion" between the CLI and the SPPPI. He wants to keep an independent structure (the CLI) devoted to the NPP, and to maintain vigilance.

The main concern of Jean-Claude Delalonde about the CLI relates to the implementation of a perennial structure:

- On one hand, he works for giving a legal statute and consolidating the financial resources of the CLI. The CLI has no legal statute, and it is a main difficulty to its financing. He believes that the State, the Departmental Assembly and the local communities should pay for the working of the CLI. He supports this point of view at the ANCLI. Furthermore, he wishes to obtain a legal statute in order to be able to constitute a team being able to work permanently and to have the means and to provide the bases of information accessible to general public.
- On the other hand, he works for introducing a debate on the future of the NPP in the context of ageing of the installations. For this purpose, he thinks the CLI has to play a key role in preparing the future and making the local population aware of this issue. Among the questions to be addressed in this perspective, Jean-Claude Delalonde has in mind the evolution of the safety of ageing installations, the dismantling of the installation (in that respect, a visit to Brenilis was organised by EDF), the long term evolution of the economic activity of the area.

B. RISK COMMUNICATION AND DIALOGUE PROCEDURES WITH THE LOCAL POPULATIONS AROUND A NUCLEAR POWER PLANT IN SWEDEN

1. BACKGROUND AND CONTEXT

1.1. Historical context

Nuclear power was taken into use in Sweden in 1972. It was expanded into 12 reactors on four sites at the most. With the final phasing out of Barsebäck 1 the total number is now 11. Nuclear power provides 50% of Sweden's energy.

Barsebäck has been one of the most debated and controversial power plants in Sweden, partly because of its location some 20 kilometres from Copenhagen. It has been in use since 1975 when its first reactor Barsebäck 1 was activated, a second reactor Barsebäck 2, was taken in use in 1977.

In 1998 the Swedish Government chose Barsebäck to be the first nuclear power plant in Sweden to take one of its reactors out of action as a first step in the phasing out of nuclear energy in Sweden. On November the 30th 1999 Barsebäck 1 was terminally closed. Barsebäck's owner was fully compensated with energy from other sources, and Barsebäck was taken over by the larger Ringhals group, with its former owner Sydkraft owning a share, but the Government owned Vattenfall owning the majority.

The *Lokala Säkerhetsnämnden vid Barsebäck* (literary "The Local Board for Safety by Barsebäck"[3]), started as all similar LLCs, in 1981, as a direct result of the referendum of Swedish nuclear power in 1980[4]. All municipalities housing nuclear power was subsequently through the Act on nuclear power, SFS 1984:3, given the right to access of information regarding the safety and radiation protection issues from the operator in the form of a LLC. With the controversy over later accidents such as Chernobyl, a new focus on communication was placed on the plant and the authorities.

In 1992 and 1993 there was a lot of negative media and public attention directed at Barsebäck, due to two reported flaws in the security system. The first one of these grew to large proportions partly due to a informative mistake by the plant in the media. After this Barsebäck's information department was strengthened, and a new policy was adopted for a more active role.

The authorities, *Statens Strålskyddsinstitut (SSI)*, the Swedish Radiation Protection Authority and *Statens Kärnkraftinspektion (SKI)*, Swedish Nuclear Power Inspectorate, also have a regulated responsibility to disseminate information to the general public.

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[3] The concept of a *Lokalt Säkerhetsråd* is unique to Sweden. The term "Local Liaison Committee" will in the following be used the concept, on the advice from the Secretary of the *Lokala säkerhetsrådet vid Barsebäck*, Staffan Ödewall, even if this is not fully equivalent.

[4] The result of the referendum being a full expansion on the already planned 12 reactors to be finished but with a long-term goal of phasing out the energy source and replace it by 2010.

This responsibility is explicitly stated in the laws regulating the instructions for the agencies.

1.2. Political and legal contexts

The regulatory framework is divided into two different aspects of the risks of nuclear power, that of *safety* and that of *radiation protection*. These two different aspects sort under different laws and regulations and under the two different authorities, *the Swedish Radiation Protection Authority (SSI)* and *the Swedish Nuclear Power Inspectorate (SKI)* both carrying a regulatory and supervisory responsibility for their field, respectively. Besides the regulatory and inspective tasks, these authorities also have a regulated responsibility to inform the public and to initiate and conduct research and development concerning nuclear power safety and radiation protection. In the instructions for the SKI in law SFS 1988:523 it is stated that the SKI shall "actively contribute to give the public insight into and information concerning the work done in the fields of nuclear safety and nuclear waste in the nation"[5]. They also have an obligation to provide technical information to other authorities in case of a nuclear technical accident whether in Sweden or abroad. Similarly the SSI has an explicit demand in their instructions in law SFS 1988:295 to "disseminate information concerning radiation protection and radiation and its qualities and fields of application"[6], and an additional obligation to provide advice to other authorities in case of a nuclear technical accident or decontamination after radioactive releases.

The main law regulating nuclear power operation is *SFS 1984:3*. It is the task of the Swedish Nuclear Power Inspectorate to check the compliance with law 1984:3. A licence is required in order to construct, own or operate a nuclear power plant as stated in law 1984:3. None of the licences granted for the existing nuclear power plants are time-limited, even if that possibility is permitted in current legislations in the matter. It is the licence-holder, that is the operator, *who has the full responsibility for the safety of the plant*; for the necessary measures being taken for maintaining the security, for a safe handling and final depositing of the nuclear waste, and for a safe phasing out and dismantling of installations no longer in use. This law gives the LLC, right to transparency from the licence-holder regarding safety and radiation protective measures taken or planned, to such an extent as to obtain information in order to inform the public. This right includes access to documents and facts as well as physical access to the premises if needed to further clarify information given.

The legal requirements for radiation protection are laid down in the Swedish Radiation Protection Act *SFS 1988:220*. The expressed objective of the radiation protection law is to protect humans, animals and the environment against the harmful effects of radiation. The Swedish Radiation Protection Agency checks the compliance with this law and the regulations or conditions issued with the support the same law.

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[5] SFS 1988:523, §2, 5. My translation from Swedish.

[6] SFS 1988:295, §2, 6.

Both these authorities have the right to issue regulations in their fields. Both authorities have a Director General appointed by the government and a Board composed as to represent a balance between different competences and perspectives, that is: experts and elected representatives from the political parties, and chaired by the Director General.

The SSI board has had parliament politicians, representatives from NGOs, representatives from other authorities, and representatives from unions. There are also advisory committees. SKI has three advisory committees; the Reactor Safety Committee, the Safeguard Committee, and the Research Committee. The members of these are appointed by the Board, except for the chairperson who will be appointed by the Government. The SSI has a Research Committee that is appointed by the Government.

The current policy for radioactive releases from nuclear power sites is regulated by the SSI FS 2000:12.This regulation was a major revision of the previous release regulations and was taken into effect in January 2002. The SSI FS 2000:12 grew out of internal discussions of SSI and in the Board, but also through the *remiss* procedures[7] (where anti-nuclear NGOs were also consulted), a reference group (including an anti-nuclear representative besides industry, authorities etc). It is the second regulation that SSI issues that includes the BAT principle besides the ALARA, which has been around for some time. The BAT principle is also a basic instrument for reducing discharges to the North East Atlantic the OSPAR convention[8]. The BAT principle is implemented in the Environmental Code SFS 1998:808.

The SSI regulation states *four rules of consideration* and for the protection of the health of humans and for the environment in paragraphs 3 through 6. These are in short[9]:

- Firstly: Human health and the environment shall be protected from harmful effects of ionizing radiation during the operation of a nuclear facility as well as in the future.
- Secondly: The limitation of releases of radioactive substances from nuclear facilities shall be based on the optimization of the radiation protection and shall be achieved by using the best available technique. The optimization of radiation protection shall include all facilities located within the same delimited area[10].

[7] All regulations must be referred to interested parties for written statements and comments in order to guarantee that different perspectives are taken into account. For more important laws the number of consulted interests can be very extensive including a wide range of authorities, NGOs, unions, interest groups, industries, local authorities etc. All comments are registered, documented, archived and often included in the written decision documents. All authorities are required to participate in this procedure on relevant issues and pertinent interest groups invited to do so. Statements not asked for are also documented and included.

[8] Barsebäck has no releases into the waters of the OSPAR Convention, but the SSI has continually included the reports on Barsebäck discharges since these are close to the Convention waters.

[9] Translation from unofficial translated version from the Swedish Radiation Protection Authority.

[10] In this regulation the “Optimization of radiation protection” is defined as “keeping radiation doses to humans as low as reasonably achievable, economic and social factors taken into account”. Best available technique is defined as: “the most effective measure available to limit release of radioactive substances

- Thirdly: The effective dose to an individual in the critical group of one year of releases of radioactive substances to air and water from all facilities located within the same geographically delimited area shall not exceed 0.1 millisievert (mSv).[11]
- Fourthly: The reference values shall be established for each nuclear power reactor with respect to annual released activity of individual radioactive substances or groups of radioactive substances. The reference values shall be worked out by the licensees and submitted to the Swedish Radiation Protection Authority for examination. The basis for the proposed reference values shall be attached to the notification.

Target values shall be established for each nuclear power reactor with respect to the release of individual radioactive substances or groups of radioactive substances and shall show the level to which the releases can be reduced over a specific period.

The introduction of reference values and target values are regarded as a direct implementation of the BAT principle. In the case of Barsebäck these values were established in 1 January 2002. New ones will be established from 2004.

Measuring and control of releases and the vicinity, must be conducted at every nuclear power installations according to the same regulation SSI FS 2000:12. This control of the environment must be quality assessed and documented according to the principles in the ISO 9000 series. The measuring laboratories used for this task shall on the demand of the Swedish Radiation Protective Authority participate in comparative measuring, so called intercalibrations. For every nuclear power reactor there must be action plans for the reduction of radioactive releases due to an eventual damage to the nuclear fuels. Check of the surrounding environment must be conducted in the vicinity of the nuclear power installation in accordance with programmes developed by the Swedish Radiation Protection Authority. For a summary of the measuring of releases to be reported to the Swedish Radiation Protection Authority se SFS FS 2000:12, annex 1. For environmental monitoring, see the same regulation, annex 2.

In the Swedish Nuclear Power Safety Inspectorate FS 1998:1, radiological accidents shall be prevented through the construction of the actual plant through several barriers, which is the physical enclosing of the radioactive substances, and a defence in depth. Both of these safety measures shall be adjusted to the specific plant in question. The defence in depth is consists of:

- *Implementing the prevention of operational disturbances and breakdown* in the design, construction, operation, surveillance, and maintenance of the installation.

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and the harmful effects of the releases on human health and the environment, which does not entail unreasonable costs".

[11] The dose limit for members of the public is 1 mSV per year from all contributing artificial radiation sources. But since many different sources may contribute to the total exposure for an individual the dose constraint for a particular site is set to 0.1mSV/year.

- *Multiple devices and preliminaries* (prepared actions/measures) preventing the barriers from breakdown, and in case of such a breakdown to reduce the consequences thereof.
- *Prevention of radioactive releases* in case of operational disturbances and breakdowns and if this is not possible, *to control and reduce these releases through devices and preliminaries.*

More specified details on the safety measures regarding the design and construction of the installation, see SKIFS 1998:1, chapter 3. The obligations for the licence-holder are put down in §3.

1.3. Industrial and environmental aspects of the concerned industry

Barsebäck has two boiling water reactors, each with the capacity of 615 MW; Barsebäck 1 and Barsebäck 2, which were taken into effect in 1975 and 1977 respectively. Barsebäck 1 was permanently shut down in 1999 due to a political decision.

Barsebäck's security systems relies on four major principles:

1. An extra set of all technical devices and components, produced by different manufactures and in different series, so that no singular weakness, is a threat to the security.
2. *The thirty minutes rule*: the first thirty minutes of security measures after a scam are handled by automatic programming, which gives the staff a margin of thirty minutes.
3. Multiple barriers containing the radioactive substances in the reactor core. If one barrier is weakened, the others are sufficient to hold the radioactivity.
4. FILTRA; a forty meter high concrete tower filled with crushed stone for condensing and keeping radioactive substances and delaying rare gases, as an extra filter in the event of extremely high pressure in the reactor tank.

The radiation doses to the most exposed individuals living close to the nuclear power plants were below 1 per cent of the permitted levels (maximum 0.1 mSv/year)[12] in 2002. The doses from the area monitoring of air and water, calculated for the critical group near the plant was less than 2,00E-04 mSv, and the lowest of the four nuclear power sites (the other sites having three or four reactors each).

The total radiation doses for the staff were 2.1 manSv, and the maximum individual dose 19.5 mSv in 2002. This is higher than previous years due to one of the largest modernisations projects in the history of Barsebäck that took place during the yearly maintenance during the summer months.

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[12] *Säkerhets- och strålskyddsläget vid de svenska kärnkraftverken 2002*. SKI-Rapport 2003:21, SSI-Rapport 2003:06, p 26.

The technical systems for reduction of radioactive releases is based on system of ion exchange filters and mechanical filters for wastewater clean-up and a system of recombiners and sand tanks for retention of rare gases and carbon filter beds. The efficiency is 98.2%. Measurement of filter and ion exchange masses during 1992-1998 gives an average value of 3.9 10^{12} per year. The discharge value to the sea during 1992-1998 gives an average value of 7.2 10^{10} Bq per year (excluding C-14 and tritium). The efficiency is 98.2%. The target value to be reached during 2004 is a reduction with a factor of two of the Co-60-releases.

The environmental and safety efforts of the company are guided by environmental goals decided upon annually. Target values for the environmental work are also selected for five different areas each year.

Every tenth year a very extensive security test is conducted. The last time was in 1995; the next one would be in 2005. The method uses probabilistic criteria based on mathematical assumptions, where all possible faults are calculated on, in a scenario where everything goes wrong simultaneously. The PSA model is a tool for detecting weaknesses that may be found at an earlier stage this way[13].

2. DESCRIPTION OF THE RISK GOVERNANCE PROCESS

2.1. Presentation of the risk governance process

2.1.1. Objectives of the risk governance process

The activities of the LLC are neither defined by the members nor by the industry but laid down in law SFS 1984:3, §§ 19-21, and further specified in the ordinance SFS 1988:810, with the prime object to guarantee transparency and influence to the local population, including local authorities of the work done or planned in safety and radiation protection issues. The task is therefore to guarantee the democratic insight into the risk governance process rather than a technical contribution to solutions of specific problems.

According to SFS 1988:810, § 2, the LLC shall particularly [14]:

1. Stay updated on the nuclear technological safety and radiation protective efforts, in particular that of the nuclear power plant in question.
2. Obtain information on the nuclear technological safety and radiation protective measures that has been conducted or that is planned on the installation.
3. Obtain information on the planning of emergency preparedness against nuclear power accidents at the installation.
4. Compile information for communicating the safety and radiation protective efforts and the emergency planning.

[13] Ibid

[14] My translation from Swedish.

5. Answer for information to the public, authorities and institutions in the local community regarding safety, and radiation protection issues and issues regarding the emergency planning against nuclear power accidents.

The first paragraph is interpreted as there being, besides the demand to stay updated on the development of safety and radiation protection of the neighbouring nuclear power plant, also an implicit demand to also stay up to date on nuclear power issues in general, that is the current development in both Sweden and in the rest of the world. Paragraph five, concerning provision of information, their task is seen as fulfilled in scrutinizing the information provided by Barsebäck and in case they have a diverging opinion, these are expressed publicly. If there is no news nor any changes, this is regarded as no information to disseminate.

2.1.2. Chronology

The first formal organization of the local communities around nuclear power plants came with the collaboration between the municipalities housing nuclear power facilities that started in 1977; *Kärnkraftkommunernas Samarbetsorgan* or KSO. This collaboration still exists as an active organization in co-operation with the Local Liaison Committees. KSO arranges all visits to nuclear power related sites and is the forum for issues that the different LLCs have in common. The LLCs started in 1981, after the referendum in 1980, and they are in contrast to the KSO decided and compensated by the Government rather than the municipality where they are situated.

2.1.3. The participants and the resources of the risk governance process

The LLC has 18 members; nine regulars and nine substitute members. The members are nominated by the local governments of Kävlinge and Lomma, but appointed by the Government[15]. The members represent the local political parties, and are allocated according to the political mandates of the latest local election. The member set-up may therefore change after the elections every fourth year. The municipality of Kävlinge, which is the location of Barsebäck, has seven representatives in the LLC whereas Lomma, the neighbouring municipality has two representatives, as according to the regulation. One of the members must be a chairman. The LLC are also required to appoint a secretary. There is also a Danish observer, with no right to vote.

The LLC is serving under the Ministry of Environment. They receive an annual budget of 400 000 Swedish crowns, distributed by the SKI. All minutes together with the annual financial report etc, are delivered to the Ministry of Environment yearly, and there archived and hence accessible to the public as according to the *Principle of public access to official records*.

[15] The requirements are specified in SFS 1988:810, §5, 8, 11-13. The Government usually goes along with the proposed list of candidates, but at least on one occasion it disapproved of the proposed list since there were too few women on the list, and the local government had to reconsider.

The Secretary (and his assistant) summons the members, writes the agenda and minutes. Representatives from the SSI, SKI and Barsebäck are summoned to most meetings, and they are especially requested to attend some. At other times scientists and researchers from universities or other research institutes are invited. The Secretary is also responsible for the web site (where all news, and minutes are published), the information in the local paper, and the information to and from the public in general.

The LLC rely primarily on Barsebäck, the authorities, the KSO for information. Barsebäck, the SSI and the SKI all produce an abundance of information material each year. The authorities play a very important role since, besides their role as regulator and inspectors; they are also experts and conduct extensive research. Not only the regulations, but also research reports and the annual inspection report of the safety and radiation protective situation of the nuclear power sites, are all freely accessible both as written documents and as pdf-files to download from their official web sites.

The SSI and the SKI are regarded both by the LLC, the industry and the authorities themselves as a neutral and independent source of information, representing not only the common interest but also being experts.

The KSO arrange introduction and continuation courses for the members in the LLC and function in general as a forum for the LLC to exchange information and experiences. They also arrange study trips abroad to nuclear power related sites together with extensive study material, and representatives of the KSO participate in the European meetings within GMF.

2.2. The issues at stake

The issues at stake are specified in the ordinance SFS 1988:810: nuclear power safety, radiation protection, and emergency planning in case of accident. This is an ongoing process of transparency, and influence, for the local public around a nuclear power plant. The actions are specified as staying updated, obtaining information, compile information, and answer for information to the public, the local authorities and institutions. This could perhaps be reformulated as task of being the informed but watching eye of the public in dialogue with a potentially hazardous industry, as an extra safety measure that risk governing decisions are not made entirely contrary to common sense or that may endanger the locals.

Results in terms of better safety measures in the presence of a LLC as compared to one without are hard to determine. The risk for corruption or for the operator to neglect the local interests and concerns are likely to be less if the decisions are exposed and questioned, especially in the presence of an expert government agency. The possibilities for covering things up should be less.

Whether as a result of the LLC or not, the trust and confidence of Barsebäck in the local community is very high. This may be due to several reasons: employment and closeness being two possible hypotheses, the communication efforts of Barsebäck and nuclear power opponents moving out of the community being others.

2.3. Analysis by the stakeholders

2.3.1. SSI –Interview with Principal Scientist Leif Moberg

Leif Moberg, Ph.D (Physics), Principal Scientist in Radio Ecology, Department of Waste Management and Environmental Protection, Swedish Radiation Protection Authority, and Swedish representative in the radioactive substances committee of OSPAR. Moberg has been involved in the development of the SSI regulations SSI FS 2000:12, concerning the protection of human health and of the environment from releases of radioactive substances from nuclear facilities. He has therefore experience of both contacts with the general public and the *remiss* procedures.

Moberg regards the LLC as largely representing the general public and does not see a conflict between their role as on the one hand laymen and on the other as a party to consult in the *remiss* procedures in decision making.

Concerning the contacts with the general public and the public influence in the *remiss* procedures, he regards the views of the public as very valuable.

“The view points of the general public are no less relevant for them not being experts. It is my personal opinion; they often pose questions which experts do not think of. At times they come up with comments that make us nonplussed. Experts are only experts in a very narrow field; if only experts were consulted the only comments we would get would be whether or not we have done correct calculations, etc. It is easy to loose the big picture, and to forget that for example research is part of a much larger context. The whole idea with the *remiss* procedure is to get a diversity of viewpoints and that one should consult others than only those who think alike. The *remiss* pronouncements are absolutely not just there as a “must”, but we read them, reflect over, and take into account what is written.” The public is also in direct touch a lot with the SSI. Their comments affect the reflections in the agency and the internal discussions. Moberg regards the SSI as ”the prolonged arm of the people. Our obligation is to protect the people from the harmful effects of radiation.”

Both the industry and the LLC regards the authorities, SSI and SKI, as the keepers of public trust regarding the information from Barsebäck, since the information from the industry is checked against that of the authorities, and ascribes them a neutral role. This is a view that Moberg agrees with according to him the SSI in this respect represent the general public. He explains this further: “We try to stand on objective grounds, to weigh the pros and cons. That is important. We base our decisions on the best knowledge available. Knowledge changes of course, but then we inform about that: this is what we knew then, but now we know this…”

Moberg also describes the independence of the Swedish agencies as being different from many other countries. According to his experience, there is more direct contact between the general public and the authorities in Sweden than in many other countries. This contributes to the high confidence in the authorities from the Swedish population. The SSI is probably more independent from the Government than is the case in some

other countries, according to Leif Moberg, where the authority can be part of the ministry. “In such a case more day-to-day political interest might come into play. We have a great independence; we have the right to regulate and to inspect. *The principle of public access to official records* is of course also important. Everything is open to the public. Anyone can control all documents without having to register”.

2.3.2. SKI - Interview with Director of Office of Reactor Safety

Christer Viktorsson, Director of Office of Reactor Safety and Deputy Director General of SKI, emphasise time and again the importance of the allocation of responsibility. The responsibility of safety is wholly and fully that of the licence holder, that is the operator. This is explicitly stated in the law, and is also supported both by international conventions and the industry. The SKI is therefore very strict on not giving any advice or having detailed regulations concerning technical solutions, but only general regulations that leave the technical implementations open. The role of the operator is thus not only to comply with the existing regulations but also to seek best practice in international comparison and have a constant and continuing improvements.

“The licence holder has a strict responsibility, which means that they are not only to comply with our regulations but that they must take all necessary actions to maintain safety. We may not have issued regulations in all areas.”

Christer Viktorsson stresses that the SKI in no way is responsible for the safety, their role is another: “We are not responsible for the safety, we are the watching eye and ears of the public that the licence-holder take their responsibility. We are not to been regarded as an extra barrier for safety.”

2.3.3. Industry- Interview with Head of Communication

Lars-Gunnar Fritz, Head of Communication, Barsebäck Kraft AB. Fritz stresses the importance of the authorities for public trust in the information from Barsebäck, and regards the problem of trust in Denmark as partly due to there not being any pertinent authorities to confirm or contradict the information in the media, which turns the whole issue into political interests and agendas. The only authority concerned with Barsebäck is the Danish Emergency Management Agency.

Barsebäck regards the LLC as a layman’s authority. Their task is, according to Lars-Gunnar Fritz, to be there for journalists and ordinary people to turn to whenever they want a layman’s opinion to what is going on. “In general”, he says, ”they are very ambitious with questions. They are a sort of ‘vigilance committee’: questioning different decisions and assessments regarding security that Barsebäck makes, with ‘Why?’”.

According to Fritz, the LLC ask control questions to Barsebäck, and checks these answers with the SKI and the SSI. They are, according to him, primarily interested in is the security conditions of the installation, and information about changes, new investments and reports. Fritz would like to see more of debate and discussions within

the LLC, that they would take a little more interest. He compares this with the environmental organisations that do take a great interest in watching Barsebäck. However, comments Fritz "they do not seem to take the same interest in watching energy production of other kinds." According to Fritz; the criticism against nuclear power is mainly focused to single elected persons against nuclear power and the environmental organisations and not so much in the Local Liaison Committee.

Fritz stresses the importance of an open atmosphere for the sake of security:
"The security policy of Barsebäck amounts to that every fault identified is reported, and also the idea is never to settle down and be content with the existing security but always to increase the demands, and to find news ways to find eventual failures – this is sort of in the nature of security efforts. But this can always be turned into something negative. The culture at Barsebäck is one with an open atmosphere where it is easy to talk of failures and so on. This is important and also positive for the security" [16].

This openness and readiness to state faults and mistakes can always be distorted by other agendas in the media etc.

2.3.4. The LLC – Interview with Secretary of the LLC

Staffan Ödewall, Secretary, LLC by Barsebäck, head of the Kävlinge Fire and Rescue Station[17].

A problem for the LLC, according to Ödewall, is the lack of information to disseminate. The five paragraphs of SFS 1988:810 all focus on the safety measures within the field of nuclear safety and the development of nuclear technology, but if there is no information to give on these topics, there is no information to provide the public with. The LLC has access to many channels for spreading information; TV, Internet, radio, local press, etc, but they don't have any information to pass on when the installation is working smoothly and both the LLC and the local community have confidence in the safety measures of the plant

According to Ödewall, the initial idea of the LLC, when they were first established was to serve as a kind of bridge between the industry and the public and to gain access to information on the operations of the installation. However, at present all the nuclear installations in Sweden have very ambitious information programmes of their own with their own information staff, with more competence to explain the technological pieces of information to the public better than the LLC.

One of the main task for the LLC is, according to the fifth paragraph, to keep the public informed – but, says, Ödewall, the public is already informed, and Barsebäck offers public transparency and information to the public – what then shall the LLC report on? If it were the case that Barsebäck was not transparent to the public, then that is

[16] Interview with Lars-Gunnar Fritz, head of communications, Barsebäck.

[17] The Fire Station was established in 1983 in order to be close to Barsebäck for emergency planning reasons. The Fire Station is also the meeting place for most of the LLCs meetings, and is the official address where the mail to the LLC, and the KSO is addressed.

something the LLC would have to let the public know through the local newspapers. But when Barsebäck is being open and transparent, the task left for the LLC is to scrutinise the information given. The task for the LLC has thereby shifted from being that of a producer of information to that of a scrutiniser of information.

There is a general opinion in the board that there more discussions at the meetings would be welcome, but many of the members have been on the board for a long time, the level of knowledge is high and the confidence in Barsebäck is extensive.

2.3.5. The LLC – elected members survey

In order to gather the viewpoints of as many of the members possible an anonymous questionnaire was mailed to all the full and substitute members of the LLC to their home address.

The questionnaire focussed around transparency and participation, information dissemination, perceived influence of the LLC, attitudes towards the LLC and areas for improvement. It contained 15 head questions; six questions were constructed on a nominal scale, seven questions (one of these questions contained 15 statements to agree or disagree with) on an 5 grade interval scale and one "I do not know" option and one open question concerning possible improvements[18].

The LLC has 18 members: nine regular members and nine substitute members. 13 of these replied. Nine of the respondents were men and four women (of 12/6 in the total population). Most of the respondents have been in the LLC four quite some time; eight of the respondents have been a members for two periods of office[19] or more, two respondents have been a members for one period of office, and only three have been a member less than one period of office[20]. All responding members are above 41 years of age.

The LLC members perceive that the viewpoints and interests of authorities (4.5 of 5 in mean), Barsebäck (4.4 of 5 in mean), and experts/scientists (4.2 of 5 in mean) are very much present within the LLC. The interests and viewpoints of the general public (3.6 of 5), Danish interests (3.8) and environmental interests (3.8) are also perceived as well represented but to a somewhat more moderate degree. The viewpoints and interests of local association (1.9 of 5) and the interests of political parties (2.2 of 5) are perceived as hardly present at all. There is an almost general agreement that no interests are lacking representation in the LLC, with two exceptions; one respondent perceived the employees' interests to be lacking and another missed the voice of opponents to nuclear power.

There is a general agreement among the LLC members concerning topics discussed at the meetings. Barsebäck impact on safety and environmental impact, the topic of risks,

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[18] See Appendix 1 and 2.

[19] A period of office was 3 years till 1993, and from 1994 four years.

[20] A fourteenth member called in and said he refrained from answering the questionnaire since he was new to the LLC, so the older members may be overrepresented in this study.

technical solutions, authority decisions, Barsebäck decisions, the role of the LLC and energy politics are all topic discussed almost always (all a mean above 4). Only scientific findings (3.5), employee issues (3.2) and local community (2.9) issues were topics addressed less frequently.

The LLC members pass on information about the LLC and topics discussed at meeting most often to their political Party or to the interest they represent (4 of 5), family members (3.9 of 5), to locals in general (3.5 of 5) and friends (3.5 of 5), and to a lesser degree to neighbours (3 of 5), work colleagues (3.4 of 5[21]) and members of associations they belong to (3.2 of 5).

The average LLC member only passes on questions and comments from the locals relatively often (3.6 of 5 in mean), and from all others moderately (2.5-3.3 of 5 in mean). The variances in all these answers are very high (0.65-2.09). One respondent specified the answer further: He or she did not receive any question and comments from his/her neighbours, whereas he or she did receive questions from friends and acquaintances, from fellow members of associations, and from colleagues. There were discussions, rather than questions within his or her family, and questions or comments from community inhabitants as a political representative.

All but one respondent perceive the LLC as being very unanimous (4.6 of 5 in mean). Disagreements are primarily explained in terms of differences in opinion concerning the nuclear power politics and the energy politics (4 respondents). Other reasons were some topics always arouse a lot of disagreement (1 respondent), the same persons are always critical (2 respondents), differences in opinions concerning environment, health and safety issues (respondent), information received does not match information from other sources (1 respondent). No member regarded differences in opinions concerning the operations of Barsebäck, lack of trust regarding the information given from Barsebäck, lack of trust for information from the authorities, or the members representing different interests to be a reason for disagreement within the LLC. One respondent commented that the LLC are unanimous *most* of the time but that there are sometimes differences in opinions concerning technical issues and solutions. Another respondent commented that they are not specialists, but that each and every one of them has some knowledge in different matters and that their joint knowledge is satisfactory in order to form an independent opinion. A third respondent commented that they are able to check the information given.

Agreements within the LLC were explained in terms of a common perception of the operations of Barsebäck (6 respondents), a common view of on environment, health and safety issues (4 respondents), trust in the information given from Barsebäck and the authorities (both 4 respondents each) and information given in accordance with information from other sources (5 respondents). No respondent explained agreements with lack of knowledge, lack of independent information or lack of possibilities to check information with authorities or science.

[21] Respondents over 65 years omitted.

Almost all members perceive the LLC to be very important (4.8 of 5 in mean, max 5 and min. 3). The members generally are of the opinion that the LLC gives them an opportunity for influence (4.1 of 5), that the company gets to know the local population (3.8 of 5), that they get to know the local industry (4.2 of 5), that they receive information to act upon (4.6 of 5), that they receive information that they would not otherwise have gained (4.8 of 5), that the general public receive information they would not otherwise have received (4.1 of 5) and that the LLC is a mutual exchange of ideas and a cooperation between the company and the local community (4.5 of 5). Most of them also think that the environmental impacts are improved upon (3.8 of 5), that the safety of the plant is improved upon (4.0 of 5), that Barsebäck takes greater responsibility (3.9 of 5), and that they feel more secure (3.9 of 5), but here the variance is greater between the answers.

Most of the members disagree strongly to that the LLC does not have role to play (1.3), that it does not supply information otherwise not received (1.2) or that information is not passed on (1.6). There are contradicting views among the respondents, one respondents being neutral towards the importance of LLCs function, and agreeing that the information is not passed on. Another respondent is neutral concerning the information being passed on.

The members are generally of the opinion that the LLC has worked rather well (4.3 of 5 in mean), no one thinks it has not worked well.

As to the open question six respondents took this opportunity to express their opinions more freely. Suggestions for improvements were the following:

- A need for more frequent meetings.
- More contact with other nuclear power communities.
- More contact with authorities
- More organised forms for disseminating information to the general public than through personal contacts.

Other comments were:

“Barsebäck has over the years disseminated information to the local community frequently and in a very plain way. The LLC has therefore not felt the obligation to also disseminate information in a more formal way. But the information that the members get through visits to other nuclear power plants and authorities etc should perhaps be disseminated in a more general way than through personal contacts in associations etc. This has been discussed in the LLC but have not been made concrete yet.”

“The politics in a community with such a large industry safeguards the employment opportunities, and [the local elected persons] are not as critical as the members from for instance environmental interest organisation would have been. But on the other hand the politics has a responsibility towards the local inhabitants. I have not been a member from the start and regard it as a very well functioning interplay between the plant and the LLC. I still believe that this is a good form; we have excellent opportunities for education to develop a critical attitude.”

"The LLC is a rationally and appropriately composed. Present tasks are relevant."

"We have developed our ways of working and of increasing our knowledge. We have demands on the information we want from the company and what we want to know. The SSI, SKI and County Administrative Board are present at our meetings and they give information in both a positive and negative direction, which is good for us. (…) We have annual evaluations of the work within the LLC and adjust whatever feels wrong or hasn't worked out."

2.3.6. The general public

The support for Barsebäck from the locals is very strong. There are critics, according to Lars-Gunnar Fritz, who argues that is because those being against the nuclear power plant have moved away from the area. Fritz does not believe that that is the case but rather that which you are familiar with you tend not worry about. The plant has been there for 30 years, the plant has been running for 27 years, there have never been any significant radioactive releases (only a fire accident in a turbine hall) – in short; Barsebäck has never caused the neighbourhood any troubles. The environment is clean around the installation. The prices on the real estates nearby the nuclear power plant are high. The nuclear power plant neither releases smoke nor makes a noise and it provides employment opportunities for the area.

According to Fritz, Barsebäck was hunted down by the opinion between 1992 and 1997. This trend was reversed in 1997 with the shutting down of the first reactor; Barsebäck then ceased to be the "bad guy" but was now the victim. Thereby the sympathy was directed towards Barsebäck whereas the antipathy now was directed towards the politicians. Barsebäck has since, according to Fritz, been able to be more outspoken. This lead to a change of focus in the information from Barsebäck: from technical data to political debate not as a strategic choice or a conscious direction but a result of reality having changed.

The last opinion poll (Temo 2002) shows that _ of the Swedes want to keep nuclear power or increase the nuclear power and less than 20% want to phase it out. These figures are not only the results from a single opinion poll. Sifo and Demoskop surveys give the same picture[22].

In November-December 2001, Demoskop conducted a research study of the attitudes toward the nuclear power plant of Barsebäck in the surrounding region. The trust and confidence is very high within the closest vicinity, about 90% give a medium to very high rating in Skåne. The equivalent figure in Denmark is about 70%. Barsebäck has the highest rating of public trust among all the nuclear power plants in Sweden[23].

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[22] Interview with Lars-Gunnar Fritz. Temo, Sifo and Demoskop are Swedish opinion research institutes.

[23] Ibid.

3. FIRST ELEMENTS OF ANALYSIS OF THE RISK GOVERNANCE PROCESS

The LLC is an independent institution for democratic influence into the risk governance process. Its justification does not rest upon decisions to increase transparency or trust from behalf of the industry or authorities, nor does it rest upon the enragement of the public over a specific topic, nor a Governmental approach to hear the public on a particular subject. The LLC has its justification established in law, which rests upon the results of a referendum. It has an annual budget from the Government, it has resources in the form education and a national and international network of contacts and it has close connections to both industry and the authorities.

The Government agencies SSI and SKI play the key roles in the risk governance, not in terms of responsibility or technical solutions - that is solely that of the licensee - but in terms of their manifold function as regulators, experts, inspectors and producers of information material. Their key role is stressed by all stakeholders: the industry, the LLC members, as well as the agencies themselves. The very role and independence of the LLC is dependent upon it. The inspecting role of the agencies is very important in this context. The nuclear power industry is very small; the SKI has only half a dozen major sites to inspect each year. This means that every nuclear power plant gets inspected at least once a month every year, and that the agency knows their operations very well. The SSI has a larger number objects to inspect, since other radiation sources than nuclear power are included in their domain, but conducts regular inspections of the nuclear sites all the same. The agencies have powerful tools to put pressure on the nuclear power plants since they can, apart from other measures call for a stoppage of production until further measures are taken or revealed weaknesses investigated. This happens almost every year at or other of the sites (usually after the annual maintenances) and is very costly for the plants.

The industry complains of being the most scrutinized industry of all, and more so than all other types of energy production, but this vulnerability to scrutiny has not only led to negative publicity in the media but also to stable trust for the Government agencies. The industry regards the trust for the authorities as vital for the trust in the information from Barsebäck.

To the LLC the authorities are the conditions for the independence of the LLC since they have both the expertise and the acquaintance with the industry. The multiple roles of the agencies make them qualified assessor of information. Their role as independent government agencies makes them regarded as a disinterested party: independent from the interests of the industry, and also, according to the agencies themselves, independent from the political interests and agendas, serving the interests of the general public.

All this affects the role the LLC can and does play; the open relationship with the industry and the scrutiny of the authorities are the conditions for the LLC procedures; Barsebäck explain their decisions and operations, and the authorities comments on and assess this information and the operations.

The role of the LLC is therefore not so much direct influence over particular decisions (that is handled by the *remiss* procedures), nor by being experts or employing experts, albeit they have that right, (that is handled by the research departments of the universities, the industry and the agencies), nor that of disseminating information to the public (information is already produced by the media, the agencies and Barsebäck NPP). Their role is one of a democratic and local access to an informed insight into all this, with the possibility to detect changes in both public concerns and in the trustworthiness of industry and agencies.

This order of risk governance rests on two key factors: the independence and incorruptness of the agencies and the general knowledge of the LLC members. The independence of the agencies towards the industry is maintained by strict codes for the inspectors and rotations policies, and towards the political interests in their organisational independence form and open relationship with the Government. Their incorruptness is checked by the transparency of the different boards, the *remiss* procedures and the principle of public access to official records. The knowledge of the LLC members is maintained through education, the access to information, the exchange of information and experiences with other LLCs and within the GMF, and also the through the discussions and meetings of the LLC itself.

C. THE DIALOGUE FORUM ESTABLISHED BY A CHEMICAL INDUSTRY IN SWEDEN

1. BACKGROUND AND CONTEXT

1.1. Historical context

Rohm and Haas Nordiska AB, a Swedish branch of the international Rohm and Haas company with headquarters in Philadelphia, dates back to 1964. The factory in Landskrona was taken into operation in 1972. In 1994 Rohm and Haas moved its headquarters from Stockholm to Landskrona. The factory was later rebuilt in 1998[24].

Rohm and Haas Nordiska AB joined the Swedish branch of the *Responsible Care* endeavour in 1991 administered by the *Swedish Plastic & Chemicals Federation* (former Association of Swedish Chemical Industries). Responsible Care is a voluntary code, and a commitment to increased consideration for environmental, safety and health effects of the operation, and increased transparency and information to the public. The international Rohm and Haas group encouraged the Landskrona branch to join, since the company has a very high profile in environmental, safety and health issues, and the American branch had been active within the American Responsible Care programme initiated by the American Chemistry Council.

Since 1993 Rohm and Haas Nordiska AB have conducted extensive attitude surveys of the local population every third year.

In 1998 they established a Community Advisory Committee (CAC) after the model of other installations within the international Rohm and Haas group. This was a unique initiative within the chemical industry in Sweden at the time and the first CAC in the country. In 1999 they received the Best Environmental Work Award in the category Environmental Communication for their communication efforts with the CAC, the newsletters to local residents and the attitude surveys of the local opinions.

1.2. Political and legal context

The regulations of the Chemical Industry sort under the Ministry of Environment and under the *Environmental Code* that was introduced in 1998. The strategies for environmental policies for the future are laid down in *the Swedish Environmental Quality Objectives – An Environmental Policy for a Sustainable Sweden* (Govt. Bill 1997/98:145) and developed in *the Swedish Environmental Objectives – Interim Targets and Action Strategies* (Bill 2000/01:130) with the explicit primary objective to hand the society over to the next generation with the major environmental problems solved. The Bill formulated 15 objectives with tight schedules for radical improvements of the environment.

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[24] See: http://www.rohmhaas.se

The Environmental Code of 1998 was taken into effect in January 1999. It was developed in order to join the different laws of environmental concern that up to that point had been taken care of in different regulations into a joint approach to the governing of environmental issues[25]. Guiding *rules of consideration* that express a common policy for the environmental issues were developed to be employed in all preventive, regulating, supervising, legal and licence matters by administrative authorities, courts and operators alike.[26] The new Code was a direct move to enhance the legal support for the realisation of the Environmental Objectives put down by the Government. The legal perspective on environmental issues was also enlarged with this Code to include social and economic aspects to a joint policy for a sustainable development.[27]

The Environmental Court replaced the former Concession Boards as a direct result of the new Code and as a step in this process of a new and more comprehensive approach to environmental legislation and governing. Their role is to apply the *Code for the Environment* and the Rules of Consideration in matters of licence, permits, damages etc.

The Rules of Consideration of the Environmental Code

In chapter 2, under the headline "General Rules of Consideration etc" in the Environmental Code, several principles for environmental concern are proposed[28]:

> **Section 1**
> *(The Rule for Burden of Proof)*
> In connection with the consideration of matters relating to permissibility, permits, approvals and exemptions and of conditions other than those relating to compensation, and in connection with supervision pursuant this Code, persons who pursue an activity or take a measure, or intend to do so, shall show that the obligations arising out of this chapter have been complied with. This shall also apply to persons who have pursued activities that may have caused damage or detriment to the environment.(…)
> **Section 2**
> *(The Knowledge Obligation)*

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[25] For a summary of older environmental legislation see: http://www.environ.se/document/lagar/mbalkinf/balkinfo/balk.htm. For an English summary: http://www.internat.naturvardsverket.se/documents/legal/code/codedoc/code.htm

[26] See EC, part four, ch. 16, section 1: "The Government, county administrative boards and other administrative authorities, municipalities, the environmental courts, the Superior Environmental Court and the Supreme Court shall deal with cases and matters governed by this Code, or rules issued in pursuance thereof."

[27] "Miljödomstolarna", DV march 2000, Domstolsverket. Kommittédirektiv – Miljöbalken – uppföljning och reformbehov.

[28] The Environmental Code, Part One, Chapter 2. General rules for consideration. English translation of the EC from the Ministy of Environment: http://miljo.regeringen.se/pressinfo/pdf/ds2000_61.pdf. I have provided the names of the principles generally in use even though they are not part of the original wordings of the Code. They are however in full correspondence with references to these paragraphs in other regulation, guidelines and elsewhere.

Persons who pursue an activity or take a measure, or intend to do so, must possess the knowledge that is necessary in view of the nature and scope of the activity or measure to protect human health and the environment against damage or detriment.

Section 3

The Precautionary Principle

Persons who pursue an activity or take a measure, or intend to do so, shall implement protective measures, comply with restrictions and take any other precautions that are necessary in order to prevent, hinder or combat damage or detriment to human health or the environment as a result of the activity or measure. For the same reason, the best possible technology shall be used in connection with professional activities. (…)

Section 4

(…) Sites for activities and measures shall always be chosen in such a way as to make it possible to achieve their purpose with a minimum of damage or detriment to human health and the environment.

Section 5

(The Principle for Resource Management/Economy of natural resources)

Persons who pursue an activity or take a measure shall conserve raw materials and energy and reuse and recycle them wherever possible. Preference shall be given to renewable energy sources.

The Product Choice Principle (formerly the Substitution Principle)

Section 6

Persons who pursue an activity or take a measure or intend to do so, shall avoid using or selling chemical products or biotechnical organisms that may involve risks to human health or the environment if products or organisms that are assumed to be less dangerous can be used instead. (…)

Section 7

(A principle of Reasonabilit/Optimisation.

The rules of consideration laid down in sections 2 to 6 shall be applicable where compliance cannot be deemed unreasonable. Particular importance shall be attached in this connection to the benefits of protective measures and other precaution in relation to their cost. The cost-benefit relationship shall also be taken into account in assessments relating to total defence activities or where a total defence measure is necessary.

(…)

Section 8

(The Polluter Pays Principle)

Persons who pursue or have pursued an activity or taken a measure that causes damage or detriment to the environment shall be responsible, until such time as the damage or detriment ceases, for remedying it to the extent deemed reasonable pursuant chapter 10. Where this Code so provides, the person may be liable for compensation for the damage or detriment instead.

Section 9

(The Stop Rule)

If an activity or measure is likely to cause significant damage or detriment to human health or the environment, even where protective measures and other precautions are taken as required by this Code, the activity or the measure may only be undertaken in special circumstances.

An activity or measure must not be undertaken if it is liable to lead to significant deterioration in the living conditions of a large number of people or substantial detriment to the environment. (…)

Section 10

If an actitivity or measure is of particular importance for reasons of public interest, the Government may permit it even in the circumstances mentioned in section 9, second

paragraph. Nevertheless, this shall not apply if the acitivity or measure is likely to be detrimental to public health.

Guidelines for the application of the code
Further the Code explicitly states that it shall be applied so that:

1. Human health and the environment are protected against damage and detriment, whether caused by pollutants or other impacts;
2. Valuable natural and cultural environments are protected and preserved;
3. Biological diversity is preserved;
4. The use of land, water and the physical environment in general is such as to secure a long-term good management in ecological, social, cultural and economic terms; and,
5. Reuse and recycling, as well as other management of materials, raw materials and energy are encouraged with a view to establishing and maintaining natural cycles.[29]

Governmental strategies and policies

In Gov Bill 1997/98:145 fifteen Environmental Quality Objectives were introduced. Most of these are concerned with the quality of a specific area of the Environment; wetlands, the marine environment, groundwater, air, forests etc. The one of concern to Rohm and Haas is *the Goal for a Non-toxic Environment*. This goal is to be understood as the Environment being free from produced or extracted substances and metals that can threaten human health or biological diversity[30]. The aim is to reach this goal within one generation. The goal for a non-toxic environment is further clarified:

- The concentrations of substances that naturally occur in the environment are close to the background concentrations.
- The levels of foreign substances in the environment are close to zero.
- Overall exposure in the work environment, the external environment and the indoor environment to particularly dangerous substances is close to zero and, as regards other chemical substances, to levels that are not harmful to human health.
- Polluted areas have been investigated and cleaned up where necessary[31].

The overall responsibility for the goal for a non-toxic environment is laid upon the National Chemicals Inspectorate[32].

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[29] The Environmental Code, Part One, Chapter 1, Section 1.

[30] Gov prop 2000/01:65. My translation and re-wording.

[31] Summary of Gov.Bill 2000/01:130 (in English), p 20f.

[32] Ibid., p 72.

A strategy to reach that goal was formulated in *The Strategy for a Non-Toxic Environment, Bill 2000/01:65*. The Strategy for reaching this goal is specified into five interim targets:

1. Knowledge about the properties of chemical substances concerning health and environment.
2. Environmental and health related information on consumer products.
3. Out-phasing of particularly hazardous substances.
4. Continuous reduction of the risks of chemicals to health and the environment.
5. Target values for Environmental Quality[33].

The Precautionary Principle and the Product Choice Principle are particularly emphasized as important rules for the continued work of reducing the risks of chemicals, both on the national arena and in the work within the EU, as is the Polluter Pays Principle[34].

The Strategy for a Non-Toxic Environment was based on three prior reports[35], which where referred to a vast number of bodies for consideration according to the Swedish *remiss* system[36]: legal authorities, other official agencies, inspectorates and governmental bodies - national and regional, minority interest bodies, experts - such as research councils and universities, NGOs, trade unions, employers organizations and a wide range of interest organisations.

1.3. Industrial and environmental aspects of the concerned industry

Rohm and Haas Nordiska AB produces bonding chemicals for the paint-, fabric-, non-woven fabric- and building substance industries and plastic pigments for the paper industry. The chemical industries sort into three different categories depending on type of production in terms of their potential risks. Depending on categories different rules regarding licence and report requirements apply. Rohm and Haas sorts under category A, and is therefore obliged to get a licence from the Environmental Court to operate. This application goes through the local County Administrative Board, which has the overall responsibility to see to it that the environmental goals put forward by the Parliament are observed in the County and to grant licences for the less hazardous industries.

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[33] My translation from Swedish.

[34] Govt Prop. 2000/01.65, p 14.

[35] SOU 2000:52, SOU 2000:53, and report 5036 “Att finna farliga flöden” from the KemI and Swedish Environmental Protection Agency.

[36] Every regulation and law passed must be referred as a *remiss* to the interested parties before being passed for comments and suggestions, these are documented and official and often included in the proposition.

The environmental effects of the Rohm and Haas operations can be divided into three main areas: waste disposals, liquid discharges and air discharges. Public concerns have primarily been focused on odour problems of air emissions. Greenpeace have previously lead a campaign against the liquid waste that is sent off from the plant to the local sewage works.

There is a daily release of 95 000 m^3/hour of air from the installation, but this is filtered through a charcoal filter, a process air scrubber and a catalyst. This has decreased the odour "disturbances" and decreased the VOC emissions. There have also been thorough improvements of the unloading procedures where the air is now lead back to the tank lorry and never released into the air.

Two ultra filter systems have been installed. This is partly a visual improvement of the water coming from the industry, filtering white water to a clear colour, and partly a pH check and a control of the nitrification. The nitrification-inhibiting factor is checked continuously in the laboratory on the premises before the waste water is released to the local sewage treatment works. Samples of this water are also sent to other laboratories. According to EHS Manager Johan Ekberg, there are no exact methods for determining the level of nitrification inhibiting factor. The margin of error is more than 10% on low levels. This control is an explicit demand from the local sewage treatment works and the Environmental Authority in the Municipality, who in this case has tougher demands than the Environmental Court who administrates the licence for chemical operations or the County Administrative Board who knows of the uncertainties in the methods of analysis. But the Municipality has a high profile in environmental concerns and has been the prompter in this question. Ideally the local government of the Municipality would like the industry to fully take care of its sewage water.

Apart from the everyday safety measures, there are regular studies of a more extensive kind, so called hazard studies (HAZOP and MAPP studies). The hazard studies consist of a full week's work of trying to detect possible areas for hazards. During this week the whole process from raw materials, transports, storage, transport within the facilities and production is looked over in order to track possible deviations or areas for improvement. The last study of this kind resulted in eight deviations – a very low number, according to the EHS Manager of the plant; some 50-60 deviations is not unusual in a study of this sort.

The company's environmental work is based on four (1999), five (2000) or six prioritised fields of concern, i.e. Environmental Goals. These are goals set anew for each year, and the results for the goals set are reported in the annual environmental report in both its popular and official form. For 2002 the Environmental Goals were the following:

1. No external complaints regarding odour, and less than eight incidents causing internal complaints about odours.
2. Dumped material such as white water concentrate, sludge disposal, and products that cannot be reprocessed should not exceed 1,200 tons.
3. Less than 50 tons of hazardous waste should be sent for burning.
4. The amount of unsorted material dumped at the local landfill should be less than 90 tons.

5. The amount of treated wastewater going to the local sewage treatments works shall be reduced with five percent.
6. The company's total energy consumption should be reduced with five percent in terms of cubic metre per produced product in comparison with the previous year.[37]

2. DESCRIPTION OF THE RISK GOVERNANCE PROCESS

2.1. Presentation of the risk governance process

2.1.1. Objectives of the risk governance process

According to the official web site of Rohm and Haas international, the idea with a CAC is: "CACs help foster communication between the management of the facilities and the local community, and to provide a better understanding of mutual needs, concerns and expectations[38]." The Bristol plant, which was the first one within the Rohm and Haas, and among the first within the Chemical industry, to start a CAC process in 1986 presents the idea of a CAC as "a innovative process to begin a meaningful dialogue with the community to learn about the questions and concerns of the community and to keep residents informed about the work that occurs at the site." They also point to that "CACs can serve as important links between chemical facilities and their neighbouring communities as a means to build mutual respect and trust"[39].

Rohm and Haas Nordiska AB in Landskrona, has besides their ambitious EHS program, invested a lot of effort into their communications with the local community. This includes communicating to the local community primarily through a newsletter distributed to all local households three times a year, and an environmental report distributed annually. It includes an extensive door-to-door attitude survey conducted once every third year in the area (comprising 200 interviewees) about their local concerns in general, and their attitudes towards the local industries and the environmental impact in particular. 1998 these communication efforts were complemented with a Community Advisory Committee for a face-to-face dialogue forum with the local community.
The initiatives for the CAC came with the international Rohm and Haas and the company's involvement in the Responsible Care commitment. One of the fundamental features of Responsible Care is: "Internal and external communication (Open house, Chemicals Day, informing neighbours and the surrounding community, etc)"[40].

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[37] *Klara Besked*, March 2002, p 5. My translation. *Klara Besked* is the official public environmental report of Rohm and Haas that is distributed to all local households in Landskrona.

[38] http://www.rohmhaas.com/community/dialogue/cac.htm

[39] Both quotes: http://www.rohmhaas.com/bristol/cac/index.htm. 08/26/03.

[40] The International Council of Chemicals Associations (ICCA) has formulated eight fundamental features for Responsible Care.

The ten points of the Responsible Care commitment, that all participating companies must sign, concerns Environment, Health and Safety. In short these rules cover: binding rules concerning EHS on executive level, employees responsibility for EHS in daily work, minimized disturbances and consumption of materials and energy in the operations, regular and systematic assessments of operations, analysis of new processes and products, information to the authorities, information to the public, advice and support to customers, the responsibility of suppliers and contractors, information to customers at the transfer of technology.

The seventh point particularly concerns the transparency and openness to the public:

> Through candid and personally formulated information, the public should be made acquainted with its operations as such, with the related benefits and risks as well as with the measures taken to minimize those risks. Uncertainty and anxiety should be met with attentively. Care for the safety and health of the employees and the general public should be given priority.

The CAC is regarded by the company as a further step in the Responsible Care commitment to transparency and openness to the local public.

From the perspective of the management of the Swedish Rohm and Haas company the CAC seem to play many different roles:

- A forum for the company to get their information across to the CAC members.
- A medium to get this information across to the local community at large through the CAC members.
- A forum for the CAC members to pose questions, raise topics of discussion and come with ideas, complaints or propositions.
- A medium for the company to get in touch with the most important issues and priorities of the community.

Apart from the exchange of information and views, there is also the normative objective of being approved of in the local community and rightly perceived, both through a positive reputation from the CAC members and through being able to know the views and values of the community through the representatives in the committee. These latter two motives calls for active community members in the committee both in being representatives of what people of the neighbourhood think, and in being in contact with many people and thereby able to spread the information given.

2.1.2. Chronology

The first CAC initiative within the Rohm and Haas group started in 1986 in Bristol, PA, USA. The Swedish CAC in Landskrona was started in 1998.

2.1.3. The participants and the resources of the risk governance process

The CAC consists of local representatives from the community of Landskrona. The members are a selection of the local population and do not represent specific interests. The members include the Research Manager for Weibull's Industries, a Professor in Molecular Biology at the University of Lund, representatives from the Swedish Society for Nature Conservation, the chairperson of the national organisation for senior citizens, a local politician and head of the culture committee, a nurse and a member of the organisation for the open-air swimming baths.

The members are proposed by the chairman, who is a former politician in the community and therefore has a wide network of contacts. He was initially contacted by the Managing Director and asked to chair the CAC and propose members. Members should either live or work in Landskrona in order to be eligible, and they should be persons with a network of contacts. The proposed agenda and the summons to meetings are sent out from the company well in time for any suggestions.

All meetings take place on the company premises, and minutes are taken by a company representative. The members are not compensated in any way.
The information given is that of the company management, no other expertise.

2.2. The issues at stake

2.2.1. The main actions (including specific issues)

The main issue at stake is the reputation and trust of the company in the local community where they are operating. The policy statement on the company website[41] points out the importance of being an accepted part of society. The company aims at being regarded as a trustworthy and responsible company, a company that does its fair share in terms of environmental responsibility, responsibility for its employees and for the concerns of the community. This is also the main concern in the survey that the company conducts[42]. According to the EHS Manager, the objective for initiating the CAC was to meet the anxieties of the public, to improve the company's reputation and to create an understanding of the operations of the plant.

The main actions are information from the company management to the local public on their operations, its effects concerning environment, health and safety, and the improvements made or planned to minimize these. Initially the problem of odour was a major concern of the local community. At the time of the establishment of the CAC, the company wanted to expand its premises and had an interest in doing this in agreement with the local opinion.

At the meeting there is information from the company, and after that comments and questions from the members. The company does not expect any immediate influence

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[41] From the Rohm and Haas website, http://www.rohmhaas.se/samhall.htm. My translations from Swedish.

[42] *Survey of Local Community Attitudes*, Landskrona 2002.

from the CAC, the idea is rather that they shall work as a barometer as to what others, non-employees, think is of importance that the company does.

According to the Managing Director he CAC "has definitely had a role to play, but they don't exactly have the competence to come up with practical suggestions. However that was never the purpose, the purpose is rather to lead Rohm and Haas in the right direction of thought". He also regards that the CAC is also a forum where faults and improvements can be explained better than in the newsletter.

2.2.2. The results

Trust and confidence for Rohm and Haas have increased after the risk communication efforts taken together (the newsletters, the Environmental Report, the open house activities, attitude surveys and the CAC). According to the Managing Director there has been quite a remarkable change in attitudes towards Rohm and Haas. In the past Rohm and Haas was relatively unknown and if known this was due to negative reasons, i.e. bad odours. Nowadays the company is better known and for positive reasons.

According to the latest attitude survey conducted for the company 39% of the interviewees had taken notice of changes conducted at the Rohm and Haas installation in recent years. The major change that the local population was aware of was the expansion of the plant. 55% mentioned this expansion. 45% mentioned measures to decrease negative environmental impact in general or air pollution specifically. 12% mentioned measures to minimise the odour problem of the plant[43].

The information about the changes at Rohm and Haas had been received mainly through the local newspapers (34%), the Rohm and Haas newsletter (30%), through talking to people (14%), and direct observation (14%). The local newspaper was a more dominant source of information in the outer region whereas the company's newsletter was the most important source in the inner region.

72% of the interviewees know about the newsletter or environmental report. 39% have read the newsletter, but only 14% the environmental report. According to Sven Persson they seem to have different target groups: within the age group 30-45 years old the environmental report is better known and more appreciated[44]. Only 10% know about the CAC. There is a slight difference in awareness between the inner and outer regions and between different age groups. In the inner region 14% know of the CAC as compared to 6% in the outer region. Only 4% of the interviewees younger than 35 know of the CAC, as compared to 15% of those above 55 years.

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[43] Ibid., 25f.

[44] Ibid.

2.3. Analysis by the stakeholders

2.3.1. The industry – interview with the Managing Director and the EHS Manager.

The number one priority of the company in terms of security and environment is their own staff. They are the most exposed if something were to happen. Accidents and impacts on the environment are not separated issues, if the focus is on the safety and security of the employees the risk for accidents and thereby negative effects on the environment are then also reduced.

There is a sincere interest in the environment and security from the Rohm and Haas group at large, from managing directors, through managers down to employees. It is also relatively easy to give economical priority to these matters. There is a constant effort to do whatever can be done; the environmental and safety awareness is very high. This is partly due to self-interest – Rohm and Haas are a part of society, negative effects on the environment and the community will affect them also.

The company management describes the CAC in terms of being an "extra conscience". "It provides a sort of unconscious sense of responsibility for the company since the thought is always present that all actions the company takes will be exposed to the direct comments of the CAC".

The company wants to regard the CAC as a sort of positive ambassadors for Rohm and Haas who explain the activities of the company in relation to others. The company plays with open cards, the CAC questions certain information which Rohm and Haas then accounts for and elucidates. The Community Advisory Committee does no research or verification of its own.

Previously problems where dealt with by not commenting on them, according to Managing Director Sven Persson. Nowadays the company takes great care to be open about problems. Problems are identified and explained to the public: this is the problem, these are the risks, and these are the effects. The importance of creating trust is stressed, and to let people ask questions about their worries.

"Transparency implies responsibility. A company being transparent implies that they will also have to take care of any problems caused and this before any transparency. One cannot be open and yet lie about the company's operations, since this will eventually become known", says Sven Persson.

That only 10-12% of the respondents in the latest public attitude survey know of the CAC is something of a disappointment to the management since 70% of the same respondents know of the newsletter and many read it, and there have been several articles on the CAC in the newsletter.

2.3.2. The CAC

2.3.2.1. Interview with the Chairman of the CAC.

The members of the CAC are not proper "interested parties". The idea is rather that they should represent a general interest and that they meet with many others. They have an interest in Rohm and Haas in the sense that they are residents in Landskrona. The idea is that they shall function as a link between the community and the company management and give signals as to how the community regards the operations of the company. And the other way around; that the information from the company is diffused to the community, and strengthens the awareness and trust.

We have a certain insight and that leads to a certain influence. We have insights into parts of the process. I believe that in those cases that a specific topic has aroused a lot of questioning within the CAC, if that is a topic that the company management has perceived as a problem themselves, then that is something that is emphasized and affects the final decisions. The effect is also that the company has to try harder when they have to account for it for the CAC.

It is interesting to see how such an international practice works. It is very well structured and well thought through. Rohm and Haas used to be a serious environmental threat in the municipality earlier, when they worked with tanning agents, and had very bad odour problems. There were a lot of public indignation and discussions. The company management put a lot of effort into changing the situation with information and out-reach activities.

The CAC is generally perceived as something positive and there has been no problem with recruiting new members. There have been representatives from schools, the political parties, and neighbours. The Swedish society differs from other European countries in that we have a very strong culture of associations and organizations. It is probably easier to find representatives in Sweden. There is probably more recruiting along the traditional strata of society. In Sweden there is a culture for organisations that encompass all strata of society. For instance one of our members the President for the national organization for senior citizens. He is one of the most active and attends almost all meetings.

The chairman also believes that trust and confidence in the company have increased with the CAC. The members are, according to him, rather impressed with how the company runs its environmental and quality work.

"I find the CAC a working practice; it is good for smaller communities and the dominant industries in the community. The company has to perform better when they have to display their efforts to the CAC".

"There is a need for replacing the members after a few years. It has worked well and has been valuable to get some insight. The company has gained in terms of good publicity".

2.3.2.2. The CAC members – a survey

An anonymous mail survey was conducted in the form of a questionnaire that was sent to the home address of all members of the CAC together with an introductory letter presenting the RISKGOV-project. The questionnaire focussed around transparency and participation, information dissemination, perceived influence of the CAC, attitudes towards the CAC and areas for improvement. It contained 16 questions, most of them 5-point interval questions, with the possibility for additional comments and "do not know" options. It also contained one open question concerning possible improvements[45].

The CAC has 15 ordinary members, 13 of these replied. Ten of the respondents were men and three women[46]. Time in the CAC varies between 2 months to 5 years, but 8 members (of 12 respondents) have been in the CAC for four years or longer.

The CAC members perceive that the view points and interests of Rohm and Haas (4.8 of 5 in mean) and environmental interests (4.2 of 5 in mean) are very much present within the CAC, whereas the interests and view points of local associations (3.1 of 5 in mean) experts and scientists (3.1 in mean), authorities (3.2 in mean) and the general public (3.5 in mean) are perceived as moderately represented; and the view points and interests of political parties hardly at all (1.4 of 5 in mean).

None of the 13 respondents perceive any interests to be missing in the CAC.

There is a general agreement among the CAC members concerning topics discussed at the meetings. Rohm and Haas impact on safety and environmental impact is a topic discussed according to all members (4.9 of 5 in mean), and so is the topic of risks (4.5 of 5 in mean) and decisions made by the company (4.5 of 5 in mean). Other topics were generally perceived as discussed but with greater variances among the respondents. Decisions made by the authorities, technical solutions, the role of the CAC local community issues, and issues concerning the employees at Rohm and Haas were all perceived as topics discussed (all above 3.5 of 5 in mean) but with a high variance (between 0.97-1.44). Scientific results rated lowest mean (3 of 5), but decisions by authorities, local community issues and employee issues received a lower minimum (1 of 5).

The CAC members pass on information about the CAC and topics discussed at meeting most often to friends (3.7 of 5 in mean), family members (4.2 of 5 in mean) and interests they represent (3.8 of 5 in mean), and more seldom to neighbours (2.8 of 5 in mean), work colleagues (2.9 of 5 in mean) and members of associations they belong to (2.7 of 5 in mean).
The average CAC member only pass on questions and comments from the organisation or interest they represent relatively often (3.7 in mean), and from all others moderately

[45] See appendix 1 and 2 for translated questions, and a statistical summary.

[46] 12 men and 3 women in the total population

(2.5-3.2 of 5) and from neighbours seldom (2 of 5). The variances in these answers are very high (1.2-2.72).

The CAC members perceive the CAC as being as being very unanimous (4.3 of 5 in mean). Disagreements are primarily explained in terms of members representing different interests (8 of 10 respondents), differences in opinions concerning the environment, health and safety issues (6 of 10 respondents) and differences in opinions concerning Rohm and Haas operations (3 of 10 respondents). Other alternatives were some topics always arouse a lot of disagreement (1 respondent), the same persons are always critical (1 respondent), information received does not match information from other sources (1 respondent). No member regarded lack of trust regarding the information given from Rohm and Haas to be a reason for disagreement within the CAC.

Agreements within the CAC were explained in terms of trust for the information given by Rohm and Haas (11 respondents) that information received matched with information from other sources (6 resp.) and a common perspective on health, environment and safety issues (5 resp.). Other reasons were lack of independent information, too little knowledge and no possibility to check information with authorities and science.

Almost all members perceive the CAC to be important (4.2 of 5 in mean, max 5 and min. 3). The members generally are of the opinion that the CAC gives them an opportunity for influence (4.0 of 5), that the company gets to know the local population (4.1 of 5), that they get to know the local industry (4.3 of 5), that they receive information to act upon (4 of 5), that they receive information that they would not otherwise have gained (4.5 of 5), that the environmental impacts are improved upon (3.9 of 5), that the safety of the plant is improved upon (4.0 of 5), that Rohm and Haas takes greater responsibility (4.1 of 5), that they feel more secure (4.2 of 5), and that the CAC is a mutual exchange of ideas and a cooperation between the company and the local community (4.8 of 5).

To a somewhat lesser extent the members agree that the general public gain access to information they would not other wise have had (3.6 of 5, min 1, max 5, variance 1.59), and to a moderate degree that the employees situation is improved upon (3.1 of 5, min 1, max 5, variance 1.36).

The members disagree with that the CAC would have no role to play (1.2 of 5), that it does not supply any information that could not be gotten hold of by other means (1.8 of 5) and that the information is not passed on but stays with the members (1.8 of 5).

The members think that the CAC has worked rather well (3.9 of 5 in mean).

As to the open question five respondents took this opportunity to express their opinions more freely. Two of these expressed contentment with the present form of the procedures. One of these specified this in that this kind of procedure results in increased transparency and access to information between the company, municipality, organizations and neighbours, etc.

Three of the respondents expressed suggestions for improvements. One respondent wished to see more members present at the meetings. Another respondent suggested shorter periods for membership to increase the commitment. The third one put is this way:

"One idea is to limit the time on the CAC to a specified number of years, for example 4-5 years. Then new people can take over in order to revitalise the CAC. The meeting procedures are easy and informal but are most of the time a one-way communication from Rohm and Haas part supplying information. The difficulties are to create a meaningful dialogue. It is hard due to lack of time and due to the meetings taking place relatively infrequently, yet often enough according to the us members."

2.3.2.3. Summary and interpretation

The transparency generally very appreciated by the members, but there seem to be no other task than to receive information (a rather passive role) for the CAC, and therefore a lack of commitment in the CAC. There is not much else to do with the information other than to be impressed with the work and improvements concerning environment and safety issues.

A more active role such as proposing agenda, exchange with other similar CACs, or in some other way to connect the information with a more active role or disseminating information is probably needed in order to vitalise the CAC.

The members of the CAC are generally happy with the present forms, particularly with the openness and transparency from the company, but there is a slight tendency for information to stay within the CAC and of one-way communication from the company. Eleven out of twelve perceives the CAC to play an important or very important role in society. Eleven out of twelve disagree totally, or strongly, that the CAC would not have any role to play. Nine out of twelve think that the CAC has worked well or very well. Despite comments regarding a tendency of one-way communication, *all respondents* would describe the CAC as "a mutual exchange of ideas, and a cooperation between the company and the local community". This statement received the most number of "I agree completely" of all statements, also from those who were more reserved in their judgement to the impact and role of the CAC.

3. FIRST ELEMENTS OF ANALYSIS OF THE RISK GOVERNANCE PROCESS

One the one hand both the industry and the members of the CAC are in general rather content with the idea and procedures of the CAC. It is perceived as an original and innovative way of increasing the contacts with the local community. Rohm and Haas has in the past been a controversial plant, primarily due to odour problems and hence had a bad reputation in the neighbourhood. This was further enhanced by the negative perception of the chemical industry in general and the tendency to be very anonymous and to keep quite about problems.

The Rohm and Haas has through the transparency efforts in general, including but not limited to, the CAC, together with a reconstruction of the actual site and installation of filters to minimize odour incidents, achieved a change of attitude and increased confidence among the local community towards the company.

However the objective from the industry that the CAC would serve as some sort of positive ambassadors for the company that puts a lot of effort into environmental, safety and health concerns, as not been as successful as was expected. The CAC is relatively unknown. The hypothesis that the information was never passed on but stayed in the CAC was tested in the survey but not confirmed. Most members disagree or disagree strongly that the information stays within the CAC and is not passed on. But when asked to specify to whom the information is given, the members do pass the information on but only to the immediate circle; the interest they represent, their friends, and most of all their family. Their network of contacts, that is work colleagues, fellow members of associations, the local inhabitant in general and neighbours are all rather occasional receivers of information.

The responses to questions regarding the passing on of information or comments from others to the board were even lower, but again with only the organised interest, family and friends as the most frequent contributors. This is interesting since the chairman does not perceive the members as representing “interests” other than being local residents, and the industry has particularly chosen persons with a large field of contacts.

One interpretation would be that the issues discussed in the CAC are not so much issues discussed outside it. The agenda is set by the industry, with the possibility of raising topics for the members. The topics discussed and the material explained may not be very “hot topics” or relevant issues from the members point of view, but appreciate them as a token of concern and a serious effort for transparency. The data presented is not questioned in the sense that they would check the information with another source. “It is a matter of trust”, as the chairman puts it.

The members mention a lack of “vitality” within the board, and declining attendance figures in the meeting minutes confirm this. Most members have been on the board for quite some time. The industry compares this with the start-up phase when the CAC was new, and all basic information concerning the operation and its environmental impact was news.

It seems the CAC treasures their invitation to transparency, but do not know what to make out of it, and the industry treasures the public trust and reputation that they have gained through transparency and don’t know how to vitalise it. The intentions are good on both sides, both treasures this type of contact and openness. But the initiative comes from elsewhere; the idea was neither that of the industry nor the public. The CAC model is in a sense part of the international Rohm and Haas sphere and not a specific solution to an acute problem from the industry’s part. Rather it is part of the international policy of the company, and the engagement in the Responsible Care programme. The other way around it is formed around one of the major concerns of the public either.

There seem to be other positive effects of the CAC: the Chairman of the CAC believes that the CAC was very valuable for the former Managing Director who was not local, and that the company has received positive publicity for it in the local newspaper and the newsletter. He also believed that the CAC meant gave valuable contacts with the environmental activists for the industry. The industry representatives also pointed to that other chemical industries in a way felt a pressure to also prioritise EHS concerns and communication efforts after the Rohm and Haas initiatives.

As for the actual decision making procedures in risk governance and in the areas of EHS, the most influential forces that lead to development and rethinking in these areas are according to the EHS Manager: the conditions related to the licence for production, the public opinion and the management board of the Rohm and Haas group. Johan Ekberg mentions the ultra filter improvement as an example of an outcome from the conditions in the licence. The opinion of the local community and how it regards the company is also an important factor influencing the environmental work. Ekberg exemplifies this; earlier there were a lot of complaints for being anonymous and for releasing bad odours. The attitude surveys serve as a useful tool in this respect, and are in some ways incentive.

The Rohm and Haas international management, having a an explicit environmental profile and with the Haas family still being influential, exercise an decisive influence on the environmental work of Rohm and Haas in Landskrona.

The innovative process here does not spring from a necessity or a problem to be solved as much as process that is regarded as positive being attributed to concepts such as community responsibility, trust and transparency rather than a specific purpose taken from one context to another. Though the concept of a CAC as such is innovative, it would perhaps be more successful if more adjusted to the interests and agendas of the local community.

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Appendix C1. Mail Survey.

The questions of the mail survey to the CAC members follow below, as a key to the descriptive statistics in appendix 2. The questions have been translated from the original Swedish, and should only serve as an indicator since valuable nuances in phrasing may be lost.
Comments to Appendix 2. Additional comments and the open questions responses are omitted from the appendix 2.

Questions (nominal scale):
1. Sex. Male(1)/Female(2).
Questions (ordinal scale):
2. Age. <25 years(1)/ 25-40 years(2)/41-65 years(3)/65 years(4).
3. For how long have you been in the CAC? (years)
(1=1 year or less; 2=2 years, 3=3 years, 4=4 years, 5=5years)
Questions (nominal scale):
4.Are you still an active member? Yes(2)/No(1).

Questions (interval scale):

(Questions on a 5-point itemized rating scale, with the extreme points "not at all" and "completely" stated, and an additional "do not know" option).
5. Which of the following parties' interests and viewpoints are put forward, in your opinion, in the CAC?
- 5.1 The company
- 5.2 Local societies, associations and organizations.
- 5.3 The general public in Landskrona
- 5.4 Experts and or scientists
- 5.5 Authorities
- 5.6 Political parties
- 5.7 Environmental interests.

Questions (nominal scale):
6. Are there any interests missing that you perceive should be represented in the CAC? No(1)/Yes(2), namely…

Questions (interval scale):

(Questions on a 5-point itemized rating scale, with the extreme points "not at all" and "completely", and an additional "do not know" option).
7. Which topics are discussed at the meetings?
- 7.1 The environmental and safety impact of the operations of the plant
- 7.2 Employee issues
- 7.3 Risks
- 7.4 Technical solutions
- 7.5 Scientific findings
- 7.6 Authority decisions concerning the operations of the plant
- 7.7 Decisions made by the company
- 7.8 The tasks of the CAC
- 7.9 Local community issues.

8. Do you pass on information about the CAC and the topics discussed to others outside the CAC?
(Questions on a five-point scale itemized rating scale from "not at all" to "always", and an "do not know" option).
- 8.1 To neighbours
- 8.2 To friends and acquaintances
- 8.3 To fellow members of associations, societies and organisations
- 8.4 To work colleagues
- 8.5 To family
- 8.6 To locals in general
- 8.7 To the organization or interest that I represent.

9. Do you pass on questions and comments from others outside the CAC to the meetings with the CAC?
(Questions on a 5-point rating scale from "not at all" to "always", and one "do not know" option.)
- 9.1From neighbours

9.2 From friends and acquaintances
9.3 From fellow members of societies, associations and organisations
9.4 From work colleagues
9.5 From family
9.6 From local inhabitants in general
9.7 From the organization or interest that I represent.

10. Is there great agreement or disagreement within the CAC?
(Questions on a five-point rating scale, from "great disagreement" to "great agreement", and one "do not know" option)

Questions (nominal scale):

11. When the members in the CAC disagree with each other, what are the reasons, in your opinion, for this disagreement? (Nominal scale, with the possibility to check one or more alternatives).

11.1Some questions always arouse a lot of disagreement, otherwise agreement.
11.2 The same critical voices are always vocal, otherwise agreement
11.3 We have different views on Rohm and Haas operations
11.4 We have different views in terms of environment, health and safety
11.5 Information form other sources do not agree with the information given in the CAC
11.6 We do not trust the information from Rohm and Haas
11.7 We represent different interests

12. When the members in the CAC agree with one another, what are the reasons, in your opinion, for this agreement?

12.1 We all share the same view on Rohm and Haas operations
12.2 We have the same view on environment, health and safety
12.3 Information from other sources agrees with the information given in the CAC
12.4 We know too little to have an independent opinion towards Rohm and Haas
12.5 We do not have access to independent information, such as independent research
12.6 We do not have any possibility to check the information given with for instance authorities or research
12.7 We trust the information from Rohm and Haas.

Questions (interval scale):

13. Do you think that the CAC plays an important societal role?

14. A number of statements follow below. Answer each of them by checking that box which corresponds with the extent to which you agree or disagree with the statement.

14.1 The CAC gives me an opportunity for influence
14.2 The company gets to know the local inhabitants.
14.3 We get to know the companies in the local community.
14.4 The CAC gives me knowledge to act from.
14.5 We are given access to information we would otherwise not have.
14.6 The general public are given access to information that they would otherwise not have had.
14.7 The environmental impact is improved upon.
14.8 The safety is improved upon.
14.9 The employee's situation is improved upon.
14.10 The company takes more responsibility.
14.11 I feel safer.
14.12 The CAC is a mutual exchange of ideas, a co-operation between the company and the local community.
14.13 The CAC doesn't have a role to play.
14.14 The CAC gives me no information I would not have received some other way.
14.15 The information stays within the CAC and is not passed on.

15. How do you think that the CAC has performed?
(Interval question of 1-5, from "very well" to "not at all".)

Open question:

16. What would the ideal CAC be like? (What can be improved upon in the present form and what could have been done differently initially?

CASE STUDIES CONCERNING THE DIALOGUE PROCESS DURING THE PREPARATION OF REAUTHORISATION OF RADIOACTIVE DISCHARGES

D. DIALOGUE PROCESS AROUND THE LIQUID AND GASEOUS RELEASES OF THE COGEMA-LA HAGUE FACILITY IN FRANCE

1. BACKGROUND AND CONTEXT

The La Hague reprocessing plant (UP2) started operation in 1966 for the reprocessing of UNGG fuel under the responsibility of the French Atomic Energy Commission (CEA), and then in 1976 started reprocessing of fuel from light water reactors (UP2-400). The responsibility for operation was transferred to COGEMA in 1978. Two new plants were built during the 1980s; the UP3-A plant for reprocessing foreign light water fuels that was commissioned in 1989 and the UP2-800 plant for reprocessing light water fuels that started in 1994. COGEMA's spent fuel reprocessing plants are located in La Hague 20 km west of Cherbourg at the far north-west of the Cotentin peninsula. They cover an area of 290 hectares (220 hectares, plus a 70-hectare area between the plant and the sea). About 6000 persons work on the site permanently, including 3000 persons working for COGEMA, 2000 persons working for subcontracting companies doing maintenance and 1000 persons working on construction of the latest projects. These three plants had reprocessed a total of 1680 tonnes of spent fuel by 1996. It constitutes one of the main economic activity of the Cherbourg regions.

In 1981, the Deputy of Cherbourg created a commission devoted to the information on this installation and composed of local elected people, local NGOs, experts from public organisations and NGOs, representatives from the workers of the COGEMA reprocessing plant. This commission is called: "Commission Spéciale Permanente d'Information près de l'Etablissement de La Hague" (CSPI).

In 1995, Professor Jean-François VIEL's team at the University of Besançon published a study performed in the region of the La Hague reprocessing plant suggesting an excess of incidence of leukemia among persons less than 25 years old within the 10 km zone (Beaumont-Hague canton), at the limit of the significance threshold: 4 cases observed between 1978 and 1992 compared with 1.4 cases expected. In January 1997, the same team published the results of a “control case” epidemiological study performed in the same region. This second study pointed out the association between some lifestyle habits - presence on local beaches, consumption of seafood, living in a granite house - and the development of cases of leukemia in persons less than 25 years old within a radius of 35 km around the La Hague reprocessing plant. The authors assumed a causal relation between this observation and the environmental exposure to ionising radiation.

The publication of the results in the media caused strong reactions among the local population, and particularly among mothers of children who took this opportunity to organize themselves into a group called "Les Mères en Colère" (Angry Mothers) and published a manifesto asking for "clear and objective information" about discharges from the La Hague reprocessing plant as well as the other nuclear installations in the

region and their potential health effects. A nation-wide debate developed around the work done by Professor VIEL involving scientists, experts, operators and associations, and extended beyond the French frontiers. In order to contribute to the many questions raised by the conclusions of this work, the Ministries of Health and of Environment set up a Scientific Committee in February 1997 to propose a «new epidemiological study in the Nord-Cotentin». Based on the findings of this committee, two expert groups were created in July 1997 to further investigate the situation: one dealing with epidemiological aspects and the other one with radioecological aspects. The working group on radioecology, called "Groupe Radioecologie Nord Cotentin - GRNC" included experts from authorities, expertise organisations, operators as well as experts from a number of local and national associations and European organisations.

Furthermore, for regulatory reasons, COGEMA asked for a revision of its licensing authorisations. In this context, the Safety authority (DGSNR) started a process for the revision of the discharges authorisations of the installation. This process lead to a negotiation, involving different experts. Although it was an opportunity for public debates, it pointed out needs for improvement as far as the involvement of local stakeholders is concerned.

The case study is devoted to the analysis of the perception of the GRNC by their participants as well as on the licensing authorisation process.

2. PRESENTATION OF THE MAIN STAKEHOLDERS

Among the stakeholders who are or have been involved in the risk governance processes associated with the follow up of the discharges of the COGEMA La Hague reprocessing plant, different categories appear :

- Public expertise and inspection organisations : IRSN, INERIS, ASN-DGSNR
- The operator : COGEMA
- Non-Governmental organisations : ACRO, CRII-RAD, GSIEN, Greenpeace
- The citizen group : Les Mères en Colère

Furthermore, the risk-governance processes were developed mainly within the three following groups or commissions : GRNC, CSPI and the ad-hoc pluralistic expert group.

PUBLIC EXPERTISE AND INSPECTION ORGANIZATIONS

IRSN - Institute for Radiological Protection and Nuclear Safety

IRSN, created by the law on the French Agency on Health and Environmental safety and by the decree of February 22, 2002, is a public establishment of an industrial and commercial nature (EPIC), under the joint authority of the Ministers of Defence, the Environment, Industry, Research and Health." It groups together more than 1 500 experts and researchers from the Institut de protection et de sûreté nucléaire (IPSN) (Institute for Nuclear Protection and Safety) and the Office de protection contre les

rayonnements ionisants (OPRI) (Office for Protection against Ionising Rays), and persons with expertise in nuclear safety and radioprotection as well as in the field of the control of nuclear and sensitive materials.

The IRSN carries out research, analysis and work within the fields of nuclear safety, protection against ionising rays, the control and protection of nuclear materials and protection against acts of malevolence. The creation of the IRSN is similar to that of agencies for health and safety. Like them, the IRSN will play an active role in providing information to the public within its fields of expertise : nuclear and radiological risks. The IRSN will not exert any authority of control. For greater transparency, the government has decided to separate the technical analysis from the function of authority of control (authorisations and decisions of a regulatory nature).

INERIS – National Institute for Industrial Environment and Risks

This institute has a mission of assessing and preventing accidental and chronic risks to people and the environment due to industrial plants, chemical substances and underground operations. Founded in 1990, INERIS is a public institution with industrial and commercial dimensions, under the supervision of the ministry for national and regional development and the environment.

As a multidisciplinary institute, INERIS conducts *research* and *expertise* activities requested by the public authorities and industrial operators. It comprises teams of chemists, physicists, physicians, ecotoxicologists, veterinary surgeons, economists, statisticians and specialists in risk assessment, (about 415 persons including 175 scientists and staff members). INERIS combines an experimental approach, modelling, a methodological approach to risks and experience feedback to allow better understanding of the phenomena that cause risks.

located at Verneuil-en-Halatte (Oise), in the Picardy Region, INERIS is equipped with physicochemical analysis laboratories and testing and computing facilities that rank among the best in France.

ASN (French Nuclear Safety Authority) – DGSNR (General Directorate for Nuclear Safety and Radiation Protection)

The French Nuclear Safety Authority is in charge, on behalf of the Government, of the control of nuclear safety and radiation protection in France for ensuring the protection of the public, workers and the environment from risks associated with nuclear activities. ASN is providing information to the citizens. ASN is under the leadership of the Ministries of Environment, Industry and Health. At the national level, this is the DGSNR (previously : DSIN and partly OPRI) which is the organisation of ASN.

THE OPERATOR

COGEMA (Compagnie Générale des Matières Radioactives)

COGEMA is an industrial group with activities covering the entire fuel cycle (ore extraction, conversion, enrichment, fuel fabrication, reprocessing, transport). Since . The La Hague reprocessing installation is located in the Nord-Cotentin region, near Cherbourg in the West part of France on the coast. This plant started its operations in 1966. Furthermore, two new plants were built: one which entered in operation in 1989 for reprocessing the foreign spent fuel and a second one in 1994 for reprocessing the French spent fuel. It has to be noticed that 6000 persons work permanently on this site, which constitutes one of the main economic activity of the Cherbourg regions.

NON-GOVERNMENTAL ORGANISATIONS

ACRO (Association pour le Contrôle de la Radioactivité dans l'Ouest - Association for Control of Radioactivity in Western France)

The ACRO is an association set up to provide information and expertise. It is provided with an analysis laboratory and its task is to provide everyone (communities, companies, persons) with inspection tools for monitoring the environment and food and industrial products. Its independence is assured by the fact that it has a large number of members and the diversity of its financial resources. The ACRO is based in the City of Caen and has three regional branches so that it can participate in several local information organizations located close to nuclear installations. In the Nord-Cotentin, the ACRO participates in the CSPI close to the La Hague plant and in the Manche Storage Centre Monitoring Commission, where it is the only association.

CRII-RAD (Commission de Recherche et d'Information Indépendante sur la Radioactivité - Independent Research and Information Commission on Radioactivity)

The CRII-RAD is an approved non-profit making association (1901 law) for protection of the environment. It was created in 1986 as a reaction to information provided by official authorities about the impact of the Chernobyl catastrophe in France. The principles that it is designed to defend are: the right to information about all questions related to radiation and the right to protection against the effects of radiation. The CRII-RAD has acquired a radioactivity analysis laboratory, equipped in particular with a gamma spectrometry measurement system and liquid scintillator so that it is capable of performing counter-expertises in the field and preparing information independent of the State and operators. Its scientific team has worked around the La Hague site several times since 1994. It has made controls on the radiological state of the environment, radiametric measurements on the sea discharge pipe for liquid effluents from treatment installations, and independent analyses, sometimes with its own funds, and sometimes at the request of Greenpeace or on behalf of the Cherbourg County Court.

GSIEN (Groupement de Scientifiques pour l'Information sur l'Energie Nucléaire - Group of Scientists for Information on Nuclear Energy)

The GSIEN was founded about 30 years ago in France, and distributes information about many questions that arise related to the development of the nuclear industry in France, including safety and radiation protection. The GSIEN has demonstrated that a fraction of the French scientific community would like evaluation structures independent of one of the largest nuclear programs in the world, by requesting access to documentation, and carrying out very many analyses in order to oblige official authorities to provide sincere information. The GSIEN has contributed to the emergence of an independent expertise that it considers as being essential to the participation of everyone in important decisions affecting the future of the country. This is why members of the GSIEN agree to participate in pluralist groups such as the Nord-Cotentin radioecology group.

Greenpeace

Greenpeace is a non-profit organisation, represented in about 40 countries all over the world. In order to keep its independence, Greenpeace doesn't accept any subsidies from governments nor firms. Greenpeace is only founded by its memberships. Greenpeace deals with all the questions related to global ecological issues. In France, Greenpeace has notably performed a series of measurements around the La Hague reproduction plant.

CITIZEN GROUP

Les Mères en Colère

Created in February 1997 after the publication of epidemiological studies on the leukeamia in the Beaumont-Hague area, the Collectif des Mères en Colère aims at analysing, requesting and disseminating information related to the regional development, to education and to the protection of the environment. Nowadays, the members of the « collectif » are coming from all the North Cotentin Region.

PLURALISTIC EXPERT GROUPS AND COMMISSIONS

GRNC – Nord-Cotentin Radiological Group

In August 1997, Dominique Voynet, ministre de l'Aménagement du territoire et de l'Environment (minister for planning and the environment) and Bernard Kouchner, Secretary of State for Health and Social Action, appointed Annie Sugier (Delegate Director for Protection at the IPSN) to act as chairman for the Nord-Cotentin Radioecology Group. The mission of this Group, composed of a series of experts from public organisations, NGOs, operators and foreign institutions, was to estimate the risk of leukemia for young people in the 0-24 years age group near the La Hague site (in the

Beaumont-Hague canton), starting from the evaluation of exposure received as a result of the different radiation sources (natural, medical diagnosis and industrial nuclear installations in the Nord-Cotentin).

On July 28 2000, Dominique Voynet, ministre de l'Aménagement du territoire et de l'Environment (minister for planning and the environment) and Dominique Gillot, Secretary of State for Health, appointed Annie Sugier to carry out the new mission of extending the work done by the Nord-Cotentin Radioecology Group, in accordance with some recommendations made by the Group itself in the conclusion of its report

THE CSPI –La Hague Plant Information Commission

The La Hague CSPI (Commission Spéciale et Permanente d'Information près de l'Etablissement de COGEMA La Hague - Special and Permanent Information Commission) was created in 1981 to inform the public about operation of the COGEMA La Hague plant and any effects it may have on the environment. It is chaired by the Member of Parliament for the Cherbourg constituency and is composed of 36 members in colleges (18 elected, 6 representatives of local unions, 6 scientists and 6 representatives of associations and environment defence movements). Ordinary meetings are held every quarter in the presence of the local press. They are open on request to associations and union or professional associations not represented in the colleges. Members of the CSPI participating in the Nord-Cotentin Radioecology Group also participated as independent experts representing local and/or national associations.

Pluralistic expert group

Composed of a small group of experts involved in the GRNC and chaired by Annie Sugier, this group was mandated by DGSNR in order to provide an advice on the document produced by COGEMA for the revision of the licensing authorisation of the La Hague reprocessing plant.

3. THE NORTH COTENTIN RADIOECOLOGY GROUP AS A PLURALIST EXPERTISE PROCESS AND THE CONSULTATIONS ASSOCIATED WITH REVISION OF THE RELEASE AUTHORISATIONS

3.1. Chronology and risk governance process

For a number of years, the COGEMA complex at La Hague has been the subject of special scrutiny as concerns both the monitoring of the discharges of radioactive and chemical effluents into the environment and the operation of the facility.

In reaction to the publications of Professor Viel and its team, the French government decided, in early 1997, to set in place a Scientific Commission chaired by Professor

Souleau[47] with the mission of carrying out a new epidemiological study. The Commission submitted an interim report in July of the same year, whereupon two new experts were entrusted by the authorities with continuing the work in hand: Annie Sugier, Director for Protection at the Institute for Radiological Protection and Nuclear Safety (IRSN) and Professor Alfred Spira, Director for Research at the French National Institute for Medical Research (INSERM). The former, as the President of the North Cotentin Radioecology Group (GRNC), was charged with reconstituting the doses received by the populations involved and assessing the leukaemia risks associated with the discharges from the COGEMA-La Hague facility, and releases from the other nuclear facilities in the region, while Professor Spira was charged with the task of repeating the epidemiological studies in greater depth. The North Cotentin Radioecology Group, a pluralistic expert group, has made a significant contribution to the debate concerning the COGEMA-La Hague facilities. Apart from the studies relating to assessments of the leukaemia risks, additional missions were entrusted to the North Cotentin Radioecology Group. These consisted of first assessing the impact of the radiological releases from the COGEMA-La Hague plant, using a regulatory approach (November 1997 mission), and subsequently assessing the impact of the chemical releases from the facilities (August 2000 mission).

Discussions had been in progress since 1994 between COGEMA and the French Nuclear Safety Authority (DSIN) concerning the issue of modifying the decrees under which the construction of the La Hague establishment was licensed, and re-assessing the radioactive discharge authorisations. Updating of the authorisations was envisaged to "enable COGEMA to adapt the general conditions of use of its facilities – *devoted to the reprocessing of the spent fuel and the treatment of effluents and waste*; to address both the expected changes in the nature of the spent fuel and the need to treat other types of effluents and special types of waste" (letter from Madame Lauvergeon, President of COGEMA, to the ministers for the environment and industry, under which the file relating to the request to modify the decree licensing three COGEMA-La Hague facilities was officially sent, in September 1999).
After the submission by COGEMA of a draft modification request file relating to its licensing authorisation, the French Nuclear Safety Authority convened, in September 1998, a pluralistic expert group chaired by Annie Sugier, as President of the North Cotentin Radioecology Group, to give an opinion on the receivability of the danger and impact studies contained in the draft file submitted by COGEMA in support of its request. The Institute for Nuclear Safety and Radiological Protection was also requested to give an opinion.

At the time, discussions were being held at different levels of the Authorities about the scope of the COGEMA request: should it be limited to a request for modification of the building licence decrees or could it also include a request for modification of the discharge authorisations? It was not until July 1999 that the French Nuclear Safety Authority informed the group of experts of the final content of the request to be submitted by COGEMA, specifying that "a release authorisation request, although desirable, could not be legally imposed" and adding that "a change of this nature can

[47] The dean of Châtenay-Malabry Pharmacology University.

only take place in accordance with the provisions of Article 13 of decree of 4 May 1995". In this decree, it is provided that "at the request of the beneficiary of the authorisation or at their own initiative, the ministers for health, industry and the environment can modify, by order, the conditions laid down in the authorisation order" (letter of 8 July 1999, from the French Nuclear Safety Authority to the pluralistic expert group).

After an initial analysis of the files, both the group of experts and the Institute for Nuclear Safety and Radiological Protection ruled, in the autumn 1998, that the draft COGEMA file was not receivable as it stood and requested additional information (letter of 13 October 1998 from the group of experts to the French Nuclear Safety Authority and letter of 22 October 1998 from the Institute for Nuclear Safety and Radiological Protection to the French Nuclear Safety Authority). After additional material was supplied by COGEMA, the French Nuclear Safety Authority convened the group of experts a second time, and they then gave a positive opinion (letter of 29 January 1999 from the group of experts to the French Nuclear Safety Authority), while criticising certain specific aspects, particularly the weakness of the chemical discharge impact study and the justifications concerning the maximum discharge level announced. *The group considers that, to bring the debate truly into the open, it would be better to choose this formula which does not impede the public inquiry and can supply the different parties involved with arguments. However, this standpoint has been rejected by some*[48]. The Institute for Nuclear Safety and Radiological Protection was also called in, and its analysis corresponded to that of the group concerning receivability, but was not made public.

The public inquiry began on 2 February 2000 and continued until 17 May 2000. The opinion of the group of experts, which included the criticism expressed by the group, was made public, as was the file submitted to the public inquiry at the request of the ministry for the environment.

Concerning the release authorisations, the latest study of the process was associated with setting new authorisations, as mentioned earlier, at the initiative of the ministers involved. Discussion of issue began in May 2000 by the French Nuclear Safety Authority, which requested the Institute for Nuclear Safety and Radiological Protection to give its opinion on "the technical basis to be adopted for setting limits concerning the radioactive component of the discharges". In its reply, in September 2000, the Institute for Nuclear Safety and Radiological Protection submitted an "analysis of the operating envelope requested by COGEMA without modification of the processes currently used and examination of the avenues of improvement in the short and longer term that could make it possible to further reduce the radioactive discharge levels". A more detailed analysis of the impact calculations for the different discharge options was then produced

[48] In its report to Parliamentary Office in March 2000 on "The consequences of nuclear waste disposal facilities on public health environment", Michèle Rivasi stated that: *"I must admit that I am somewhat surprised by Madame Sugier's opinion, as it is highly contradictory. On the one hand, it asserts that the margins are not explicit, that sufficient detailed data is not available… which does not stop the conclusion being reached that the file on the question is receivable!" (p. 390).*

by the Institute for Nuclear Safety and Radiological Protection in December 2000. The Institute for Nuclear Safety and Radiological Protection was thus properly playing its role of expert adviser by proposing alternatives, with the final decision being left to the authorities.

Meanwhile, the North Cotentin Radioecology Group was continuing its work. In particular, in July 2000, it was entrusted with another mission relating to analysis of the uncertainties associated with assessment of radiological impact and on study of the impact of the chemical discharges. This last point corresponded to one of the main reservations of the receivability group that intervened prior to the public inquiry. *It is thus clearly apparent that the strategy of the receivability group was given practical effect as its criticisms, which were made rather than to a declaration of non-receivability – led the authorities to request that a study be made of the impact of the chemical discharges.*

The construction licence decrees were finally modified on 10 January 2003. It should, however, be noted that an appeal to the State Council was lodged by Greenpeace.

The chronology of the events is shown in greater detail in Appendix 1.

3.2. Analysis of the North Cotentin Radioecology Group process

The initial task assigned to the GRNC was to reconstruct doses received from all industrial, medical and natural sources and to estimate the risk of leukemia associated with ionising radiation for young people under 25 years old. This was done assuming as a precautionary approach that a risk exists regardless of the level of the dose, i.e. using a linear no-threshold relationship between the dose and the risk. Much of the critical effort was made for sources from the nuclear industry present in the Nord-Cotentin, and particularly the La Hague reprocessing plant. The group developed a retrospective analysis to estimate the risk associated with ionising radiation, based on an inventory of discharges from Nord-Cotentin nuclear installations, and radioactivity measurements made essentially to satisfy the requirements of regulatory environmental monitoring.

Members of the GRNC quickly realized that traceability of its activities and availability of information were the first prerequisites for a transparent debate and credibility of the group's work. Therefore, it was decided that a progress report would be written following each session of the working groups. Meetings of the plenary group were typed in full and detailed minutes were written for each meeting. Summary conclusions were published within 48 hours and helped to identify points of agreement and disagreement during the sessions. These documents could be used by any member of the group for any external communication.

As soon as the North Cotentin Radioecology Group was created, it was agreed that any member of the group would be free to provide any information about the state of progress of the studies provided that they did not give any conclusions about the work being done before they had been scientifically validated. It was decided that members of the GRNC would not be governed by any type of confidentiality obligation. Finally, all

mail addressed to the members of the group or to its President were circulated within the group.

The GRNC has been in regular contact with local organisations concerned by its task. It presented a progress report on the group's work to the La Hague Plant Special and Permanent Information Committee (CSPI) on several occasions. The presence of observers and the press at CSPI meetings provided an opportunity to broadly distribute information about progress of GRNC work to the public. Local groups such as the "Mères en Colère" and national associations such as Greenpeace involved in the debate that followed the publication of Professor Jean-François Viel and colleagues study, and that attended CSPI meetings as observers, were informed about the GRNC's intermediate results and progress as it was made. Some of their questions helped to contribute to enriching the critical work done by experts. The President herself provided direct and regular information to the "Mères en Colère".

The GRNC adopted a two-fold structure to perform the various aspects of its task. There was the Plenary Group that met regularly (20 meetings in total) and four specialized working groups including members of the plenary group and other experts, each working group being assigned to one of the following tasks:

- critical examination of discharges reported by operators of Nord-Cotentin nuclear installations,
- collection and interpretation of environmental measurements made by the various participants,
- comparison of transfer models of radioactive discharges through the environment and comparison of the predicted results from models with measurements,
- estimation of doses received by the public and of the risk to the public of contracting leukaemia.

The four groups worked in parallel using an iterative approach for their questioning, so that the available data or models could be explored exhaustively, or, possibly, new measurements could be made. Coordination was necessary to achieve logical linkage between the groups. This type of approach involving pluralistic expertise took a relatively long time, but the result was that the analysis could be made systematically and new questions could be raised.

The work resulted in the reconstruction of the release source terms for the nuclear installations since 1966, including more than 80 radionuclides and taking into account the incidents that occurred during this period. These results did not cast doubt on data supplied by operators in terms of released activity, however they did help to clarify the composition of discharges which was necessary to make dosimetric impact calculations.

Furthermore, about 500,000 measurements of radionuclide activity concentrations in the environment were collected and analysed. Although most of the measurements made in the past were provided by the operators, the collection of the measurements taken by various laboratories (including research and non-institutional laboratories) was quite useful to complement the information for specific release points. Despite the diversity of procedures, all this work demonstrated that all results were generally consistent and

participants reached a consensus about the analysis of the variation of radioactivity concentrations detected in the environment.

As far as the modelling was concerned, the available models were evaluated and compared. The role of local associations and laboratories was fundamental for making the selected models as realistic as possible by taking local conditions into account to improve accuracy.

For the evaluation of exposure, the values of the parameters characterizing the dose-relevant habits of people in the exposed cohort were discussed and then validated, giving priority to realism. These values were adjusted to local habits based on enquiries on consumption and input from GRNC experts familiar with local habits and customs. Then, for the evaluation of the risk of leukaemia, the group adopted the internationally recognized models for dose-effect relationships without any threshold.

Considering all investigations and results, the GRNC final main conclusions were (GRNC 1999):

"Epidemiological studies have shown that the total number of cases of leukaemia expected in the Beaumont-Hague canton from 1978 to 1996 would be of the order of 2 if the occurrence rate of this disease was the same as the value observed nationally. Four cases were observed. Nevertheless, this difference is not statistically significant.

The reconstruction of exposures from nuclear installations, as was done by the Nord-Cotentin Radioecology Group, has led to a calculated number of 0.0014 cases of radiation-induced leukaemia during the 1978-1996 period. This number is low considering the incidence of leukaemia observed by recent epidemiological studies.

However, this result is an average estimate and at this stage it should be emphasized that margins of uncertainty have not been quantified. Due to these reservations, some members of the group are of the opinion that it is impossible at this stage to conclude that it is unlikely that discharges from nuclear installations contribute to the incidence of leukaemia observed in the Beaumont-Hague canton.

The results obtained can be compared with the results of similar studies carried out in the United Kingdom around the Dounreay and Sellafield reprocessing plants. The conclusion of the British studies was that the observed number of cases of leukaemia cannot be explained by discharges from nuclear installations".

More generally, the GRNC concluded that *"the work done (epidemiological and radio-ecological) cannot explain the relatively high observed number of cases of leukaemia , but does not disprove the basic working assumption that there is no threshold in the dose/effect relationship, in other words low doses are related to a low risk rather than a zero risk. However as a result of this work, it is recommended that priority should be given to carrying out a more detailed study of exposures due to medical and natural sources in the Nord-Cotentin, and that in any case, exposures of the public to all sources should be minimized (as required by the regulations)".*

Finally, most of the members of the North Cotentin Radioecology Group considered the results obtained as "a best estimate" which needs to be further investigated, especially for analysing its uncertainty. In this respect, the report of the group has to be seen as a tool which could evolve according to the improvements obtained in the continuation of the work and constitutes a basis for the discussions between the different stakeholders.

3.3. Analysis of the discharge authorisation process

The study highlights an informal process of dialogue between the authorities and the operator prior to the application being officially lodged and, hence, the public inquiry. This classic approach makes it possible to avoid unnecessary formalities and intended to focus better on the petitioners requests. However, this approach, as it has not made public, makes the process harder to understand and blurs the distinction between the respective roles of the operator and the authorities, on which the credibility of the supervisory system depends. As for the discussions that take place in the public inquiry, they are just a facility available to the authorities in its decision-making process but do not necessarily throw any light on the motives for the decisions finally made, as some of the underlying technical arguments are not made public.

The fact that the public inquiry related to the licensing authorisation decree and not to the discharge authorisation application also made it harder to understand the analysis process entrusted to the pluralistic expert group. Accordingly, the request made by the French Nuclear Safety Authority to the expert group related to discharges even though the public inquiry was limited to the licensing authorisation decree: *"In the context of the process of revision of the regulatory provisions governing the activities of the La Hague facilities, I wish to receive the opinion of the group of experts on the receivability of the danger and impact studies supplied by COGEMA to support its requests"* (French Nuclear Safety Authority letter dated 14 September 1998)[49].

However, the dialogue between the operator and the authorities led the operator to introduce, without being required to under the regulations, into the file submitted to the public inquiry, as mentioned in the background above, information that could be used by the authorities to revise its discharge authorisations. This enabled the pluralistic expert group to consider this aspect in detail. The file submitted by the operator thus reflected earlier discussions and prevented the entire process from being visible.

Similarly, the questions raised by the speakers in the context of a public inquiry did not lead to a dialogue with the operator as the answers were not released or publicly debated. They were entrusted to the chairman of the inquiry after closure of the public

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[49] In this letter, the Director of the French Nuclear Safety Authority stated that he wished to receive the opinion of the group of experts on the receivability of the studies, particularly as concerned:

- *"the methodology used by COGEMA to assess the impact of the plants on the various populations and the environment, with reference to the work performed by the North Cotentin Radioecology Group,*

- optimisation and justification of the nominal discharges announced by the operator and their consistency with the ultimate goal of getting liquid releases to asymptotically approach zero."

sessions. It was also be noted that some of the documents in the nuclear safety file were confidential, and were therefore not examined by the multilateral expert group on receivability or during public inquiry. Finally, any instructions that the authorities intended to issue concerning a new authorisation were not subjected to the public inquiry.

As concerns the consultation progress itself, analysis of the case study indicates a certain number of innovations. By entrusting study of receivability to a pluralistic expert group, the authorities broadened the scope of expert appraisal. Furthermore, the pluralistic expert group made extensive use of the expertise acquired in the context of the work of the North Cotentin Radioecology Group. In view of its level of expertise and its knowledge of the assessment of the impact of the discharges of the La Hague facilities, this group of experts was able to precisely analyse the entire danger and impact study and to pertinently request further information from the operator. The remarks and comments of the group of experts were carefully addressed by the authorities, and also used by the associations when commenting.

Although the file submitted remained the responsibility of the operator, it clearly included allowance for many observations and suggestions by both the authorities and the pluralistic expert group in charge of studying its receivability, which were introduced before its was submitted. However these modifications were made without the public knowing. Some of what the authorities had been doing was thus concealed, giving weight to the view, held by many of the local players, that the operator and the authorities were in collusion.

In this context, it is finally to be noted that the Ad-hoc Standing Committee for Information of the COGEMA establishment at La Hague (CSPI) was anxious to contribute to the public inquiry procedure (public meeting project, proposal to distribute documents to the population). However, this case study revealed the compartmentalised nature of the public inquiry concerning consultation facility represented by the local commissions (the CSPI in this case). It is significant that the CSPI's plan to organise a meeting as part of the public inquiry was cancelled when reservations were expressed by the chairman of inquiry who considered that the presentation *"of the opinion of the group of experts on receivability… would raise regulatory problems in the context of the inquiry in progress"* (letter from the Chairman of the Inquiry Commission dated 4 February 2000). However the same President personally organised a public meeting a month later (which was boycotted by most of the associations).

4. POINT OF VIEW OF THE STAKEHOLDERS

4.1. The North Cotentin Radioecology Group process

The point of view of experts from associations

The experts from associations who participated in the group's work were questioned, after the work had been completed, to get a good understanding of what they thought about the procedure and the lessons that they had learned from it for the future (Lochard

et al. 2000). The fact that these experts wanted to explicitly express reservations about the final conclusions clearly demonstrated differences in the interpretation of the results, and also the method adopted by the group.

From the comments of the experts, it was clear that they were generally quite interested in participating in this experiment of pluralistic expertise and they had the opportunity to ask questions about the models and assumptions adopted for the assessment. Nevertheless, they reported difficulty caused by their participation as independent experts in the GRNC, within their own association as well as outside it. They had to clearly state that participating in the work done by the group did not mean agreeing with everything done by the group.

They generally considered that the results still include large uncertainties, and thus expressed reservations about the conclusion, and the need for further investigations, especially better to take into consideration the specificity of the local habits.

Moreover, one of the associations represented in the North Cotentin Radioecology Group did not want to be associated with the GRNC's conclusions, as far as this expert body considered that it was not possible to find solutions to fundamental differences within the deadline for the group to provide their conclusions. In particular, their representative considered that the evaluation was far from being complete and he would have liked a clearer statement from the GRNC members on limitations of the results. He also considered that the methodology adopted for the dose and risk calculations should have been further questioned, while the position of the GRNC was to adopt the international consensus on this topic.

Further aspects regarding the need for vigilance in the future with regard to discharges of nuclear installations were also quoted by members of the associations, as well as the importance of introducing a debate on the quality of the environment now and in the long-term and the legitimacy of the radioactive discharges.

The associations wanted to point out that it is by no means certain that pluralistic expertise will necessarily contribute to social confidence. The fact that associations are present in the evaluation process for the impact of discharges from nuclear installations does not mean that they accept these discharges. The term "social confidence", that has been fashionable recently, should not conceal the reality of disagreements and should not be interpreted as a pure and simple acceptance of the situations concerned.

For most of them, the GRNC experience demonstrated the advantage of setting up a new regulatory mechanism for monitoring discharges from nuclear installations into the environment. This regulatory control of nuclear installations should enable increased, credible and sustainable participation of the public, particularly by getting pluralistic expertise involved in the process of assessing the impact of releases and the quality of the monitoring of these installations. The nature of this approach should encourage confidence in the entire evaluation and control process, which up to now has mainly been based on confidence in the public authorities through its control organisations. In their opinion, if this type of process is to operate correctly, it must initiate a genuine dialogue between the various stakeholders, accepting that all questions of any nature

can be asked and that answers should be given to them. In this respect, they considered it essential that operators and the public authorities should make all information available to independent experts so that they can carry out their role of making critical examinations and thus supporting their questions.

Some of them considered that the widened composition of the GRNC was beneficial in that it increased the scope of the debates and that this type of method should be extended to other situations. However, they underlined the need for additional means (human and financial resources) in order to improve the efficiency of the "independent" expertise.

The point of view of the "Mères en Colère"

The "Mères en Colère" group was created in February 1997, shortly after the second study by Pobel and Viel (1997) was published, and played an important role in the procedure that resulted in the setting up of the GRNC. Although the "Mères en Colère" did not participate in the GRNC directly, fairly regular contacts were held with its President who was careful to inform the group about developments throughout the process.

For the "Mères en Colère", setting up the GRNC was an important step in the process of obtaining information about discharges from Nord-Cotentin nuclear installations. The work done by the GRNC provided the first elements of an answer to their worry, and the results about the risk of leukaemia were received with some relief, since there had been real anxiety among the population and particularly families with young children. In particular, the participation of experts from non-institutional organisations in the GRNC contributed to the confidence they had in the quality of the work performed by the group. However, the GRNC's evaluation did not nearly answer all questions raised by the "Mères en Colère" as the GRNC work progressed. However, the work in general was followed with a great deal of attention. The group considered that although no direct relationship could be established between the four cases of leukaemia observed in the canton and discharges from installations, the work done by the GRNC provided no new information about possible health effects other than leukaemia caused by radiation. Furthermore, the "Mères en Colère" considered that because uncertainties were not estimated doubts remained and therefore investigations should be continued for other potential risk factors and particularly for chemical discharges.

Beyond an interpretation of the results, the "Mères en Colère" emphasized that the GRNC's approach helped to progress a situation that was blocked due to lack of information, since available information was intended only for experts and could only be interpreted by experts. Members of the "Mères en Colère" group had the feeling that they have been taken seriously in their desire to understand and be able to obtain independent, credible and clear information, which had never been the case in the past. The fact that the President of the GRNC came to visit them personally to present the results before making them public was seen by the "Mères en Colère" as a mark of respect that was appreciated. The "Mères en Colère" would like to see this method repeated in the future and is considering taking action in the future to enable it to

maintain contacts and dialogue with scientists. The group would also like to see the type of approach developed within the GRNC applied to other industrial activities.
Members of the "Mères en Colère" decided to continue the GRNC's work "in their own way" to understand what is happening in their direct and daily environment. In this respect they organized an international assembly of mobile radiological laboratories in the autumn of 2000. It was an opportunity for them to get information on the routine discharges from nuclear installations and natural radioactivity of granite by making measurements on sites identified by inhabitants.

4.2. Discharge authorisation process

The debate about radioactive discharges

As COGEMA adopted the standpoint that the changes in activity requested would not require application for modification of the current discharge authorisations, COGEMA's presentation of the impacts associated with the discharges focused on the following two points which, as stated in the Inquiry Commission report itself, *"do not help to clarify the issue"*:

- the discharges currently authorised for the La Hague facilities, which COGEMA considers do not raise any health problems (as critical group exposure is estimated at around 0.115 mSv/year);

- the nominal discharges, which can be equated to the goals that COGEMA has committed itself to for the future and implicitly correspond to what COGEMA is requesting in terms of discharge authorisations (the impacts of these discharges were considered from two aspects, discharges that COGEMA can comply with using the current facilities (i.e. a dose of 0.06 mSv/year) and the discharges that COGEMA agrees to comply with after introducing new technology in the future (i.e. a dose of 0.03 mSv/year).

Apart from technical aspects, COGEMA's presentation did not show how the actual discharges from the facilities would evolve. On the basis of the analyses submitted by the receivability group, the different groups that analysed the file all expressed the same reservation: on the basis of the nominal discharges, the operator could both claim that it was reducing its discharges by introducing new systems to limit exposure of the critical group to 0.03 mSv/year while, at the same time, increasing its actual discharges by a factor of 3 or 4!

The receivability group accordingly emphasized, in its ruling of 29 September 1999, *"that the quantification and justification of the margins of manoeuvre and safety offered by the nominal discharge levels are not explicitly stated in the file. (…) The group considers that it is normal for the operator to set maximum values for its discharges (the so-called "nominal" values), that are lower than the authorised values and include, relative to the actual discharge values, the margins for safety and manoeuvre. However, these margins should be stated and the reasons for their choice explained."* It is also noteworthy that the conclusion of the group concerning the methodology aspect

of the impact study submitted by COGEMA was that: *"… the study of the impact of the radioactive discharges appears to be very thorough and consistent with the methodological approach adopted by the North Cotentin Radioecology Group. It should, however, during the examination of the file, be revised concerning the choice of the critical group and the associated hypotheses"*.

In its letter to the ministers on 28 March 2000, CRII-RAD (an independent association providing information on the nuclear industry) reviewing the analysis, mentioned that *"the departments of your ministry, and indeed the public, have certainly been misled by the way the file was presented: by concentrating its proofs on the nominal discharges and the limits set under the 1984 discharge authorisation decrees, the petitioner has managed to focus attention on its project to reduce, in the medium term, the impact of its nominal discharges as concerns exposure and to thus conceal the increase in the actual discharges. Yet it is clearly the trends in the actual increases which constitutes the important point"*.

It is, however, to be noted that the analyses made by both the group of experts and the Institute for Nuclear Safety and Protection concerning the receivability of the file submitted by COGEMA were particularly concerned with explanation of the improvements to be expected in terms of reduction of the actual releases from the facilities in the short and medium term.

Finally, it must be emphasized that the ACRO (an independent association on the control of radioactivity in Western France), in its April 2000 report, requests *"that the authorities, as they have publicly pledged, issue authorisations for liquid and gaseous discharges that are lower [and that] future authorisations be based on the current actual discharge levels and not on the nominal discharge levels proned by the operator."*

The debate about chemical releases

As concerns chemical releases, the debate mainly focused on the absence of detailed analysis, as compared to radionuclides.

In particular, unlike the situation concerning radioactive discharges, the range of methodologies available for carrying out impact studies on chemical releases from nuclear facilities remains limited. Concerning this point, it is important to emphasize the interest of the authorities in the problem, particularly as reflected by the new mission entrusted to the North Cotentin Radioecology Group in this domain.

Apart from these methodology questions, in the file submitted for the public inquiry, COGEMA was criticized for not having documented the chemical discharges and their trends. In particular, during the public meeting on 15 March 2000, the experts from the INERIS (a French national institute for industrial facility, chemicals and underground operations risk assessment) involved in the group of experts on receivability emphasized that: *"What appears to be missing from the file is a more comprehensive analysis of all the chemical products as, if there are changes in the types of fuel, there*

are probably changes in the associated chemistry". (See Public Inquiry Commission report.)

The experts emphasize the need for in-depth analysis of the chemical discharges from the facilities in order to make it possible to better assess trends and the efforts made to minimise the discharges. The ruling of the group of experts on receivability accordingly concluded on 29 September 1999 that:

"The logic of establishing maximum chemical discharges is not clearly explained. Furthermore, unlike in the case of radioactive discharges, the margins between the maximum discharges and the actual discharges appear to be small. Insofar as COGEMA is thus imposing upon itself operating constraints which it could find difficult to comply with, the group considers that COGEMA should, during the study of this file, clearly states its policy for minimisation of the chemical component of the discharges, with due allowance for the direct impacts on the ecosystems as well as the indirect impacts on man of the main components of the effluents."

For the ACRO, in its April 2000 report, the trends in the chemical discharges should have led the operator to submit a new authorisation request. It accordingly quotes the changes observed by the group of experts on receivability:

- the request to increase the discharges of TBP from 6.7 t/year to 10 t/year (corresponding to an increase of more than 10%…),
- the request for discharges of new chemical pollutants (nitrites, sulphur, mercury, cadmium etc.),
- addition of a number of radionuclides clearly identified by the North Cotentin Radioecology Group (+53%).

In its comments on 13 April 2000, Greenpeace also emphasizes that the COGEMA dossier did not make it possible to assess the impact of the chemical discharges which, according to the association, constituted an important component of the changes associated with the facilities:

"Future treatment operations will result in a rise in not only radioactive discharges but also the chemical discharges, both quantitatively and qualitatively. (…) Yet it is clear that the absence of any quantitative chemical study of the actual gaseous and liquid discharges prevents us from determining the true impact of the changes in the purpose of the licensed nuclear facilities. The direct impact on the ecosystems and the indirect impacts on man of the main components of the effluents are not sufficiently well explained."

5. FIRST ANALYSIS

5.1. The North Cotentin Radioecology Group process

Broadening of the GRNC beyond the traditional framework of discussions between operators and representatives of expert organisations has contributed to improving the

quality of the work, and undoubtedly its credibility. The presence of representatives of non-institutional organisations and foreign experts has enriched the work by adding complementary skills and sensitivities essential for a critical analysis. In return, the joint work over the long term and a comparison of sometimes very different points of view has undoubtedly assisted the stakeholders in reaching a better understanding of each other's logic and values, and eventually contributed to a better mutual understanding.

From the point of view of the public, incorporating pluralistic expertise is undoubtedly a guarantee of better quality results, requiring more than ever before a clear statement of the issues and debates to which the different parties can contribute. It is now recognised that expertise, although founded on known scientific facts, inevitably involves more or less implicit choices made particularly to get around scientific uncertainties and gaps in knowledge. Bringing together experts representing different interests of the public, and experts in different disciplines, helps to highlight these implicit choices and therefore make a better distinction between what actually depends on science and engineering and what depends on values and firm convictions (EC 2000).

It is obvious that the presence of experts within associations who can hardly be suspected of concessions to operators, authorities and institutional experts, can only help to ensure that nothing is swept “under the carpet” and avoid what some considered to be dead ends harmful to the credibility of the entire evaluation process.

Setting up a forum enabled the different groups of experts involved firstly to assess their mutual credibility, which is a prerequisite for debate. Thus, a consensus was gradually established about the quality of measurements made by the various participants. The existence of a structure including experts from different social backgrounds allowed the group to deal with points of disagreement or even controversies, without the use of invective. This provides a setting for a common search for solutions. Moreover, by incorporating local components and interests, pluralistic expertise is a mean of enriching evaluation models based on better knowledge of local habits.

One of the last important questions that emerged from the GRNC work was the re-evaluation of the objective of environmental monitoring. The vast majority of the 500,000 measurements resulting from routine monitoring of the environment were made to detect possible malfunction in these installations. However, there were far fewer measurements that could be used to give as realistic and exhaustive reconstruction as possible of doses received by the public. Furthermore, these measurements concerned not only radionuclides released by the installations, but also radionuclides present in the environment (natural radioactivity, fallout from tests and the Chernobyl accident, etc.). Therefore, to get an idea about the future of radionuclides in the environment and their contribution to exposure of the public, measurements other than routine measurements have to be envisaged. This type of measurement would also participate towards the effort made to monitor the global quality of the environment, in the same way as measurements made on non-radioactive pollutants and health monitoring of the public. These two types of measurements are undoubtedly justified and complementary.

Finally, the GRNC has demonstrated the feasibility and the interest in pluralistic expertise in the assessment and management of radiological releases. According to the

point of view of non-institutional experts, there is a need for the continuation of such an approach which gives them the opportunity to be involved in the "surveillance" of the environmental releases from nuclear installations. For the authorities, it provides pluralistic assessment of complex situations which is valuable for setting up the regulation framework for surveillance of releases from nuclear installations. For the operators, this approach introduces a forum with the different stakeholders where open discussions on the environmental and health impacts of the releases of the installations can occur. For the local population, it is a guarantee of access to good quality information and answers to some of their questions.

5.2. Discharges authorisation process

The licensing authorisation process which started in 1994 has been analysed into details. The first element of analysis are the following :

- Before the submission of the official request, a dialogue was established between the public authority and the operator. This process on one hand permits to avoid useless procedures, but on the other hand did not favour the "readability" of the process.
- The public enquiry is seen as a tool for the public authority to provide information to the public. However, the authorities do not have any obligation to explain their final decision. The CSPI proposed some actions in order to improve the diffusion of the information during the public enquiry : it requested additional copies of the document for the NGOs; it proposed to put the document on the web (but this proposal was not implemented); and finally proposed to organise a public meeting (this meeting was however cancelled and replaced by a meeting organised by the commission of the public enquiry).
- It can be noticed that NGOs have been largely involved in the analysis of the documents. Their comments concerned the acceptability of discharges.
- A large documentation was provided by the operator related to the impact assessment study.
- Some questions still remains :
    - There is not a convergent point of view related to the simultaneous request of modification of licensing authorisations and discharges authorisation.
    - There was not a real debate between all the stakeholders. In fact, most NGO's did not attend the public meetings because they did not consider it as credible.
    - There was a lack of discussion on the level of discharges considered as acceptable (only a detailed discussion on the "admissibility" of the request)
    - There was a lack of knowledge on the impacts associated with the chemicals discharges from the installation.

APPENDIX D1 - . THE CHRONOLOGY OF THE EVENTS

July 1997: Creation of the North Cotentin Radioecology Group to reconstitute the doses and assess the risks of leukaemia associated with the discharges from the COGEMA complex at La Hague (at the same time, an epidemiology commission was entrusted to Professor Alfred Spira).

Nov. 1997: North Cotentin Radioecology Group requested to perform an additional mission relating to assessment of specific exposure scenarios to assist the authorities in modifying the discharge authorisations of the La Hague facilities.

17/7/98: Memo from the French Nuclear Safety Authority on revision of the COGEMA La Hague authorisations, specifying the context of the negotiations in progress since 1994 on modification of the licensing authorisation decrees and review of the radioactive discharge authorisations. This memo stated that updating of the authorisations was envisaged to better cover operation of three recent facilities (for reprocessing of spent fuel and treatment of effluents and waste) which would make up most of the work of the plant in the coming decades.

13/8/98: Supply by COGEMA to the French Nuclear Safety Authority of a draft application file for modification of its licensing authorisation decrees, preceded by a draft letter stating COGEMA's request (Mr. Syrota).

14/9/98: Forming by the French Nuclear Safety Authority of a multilateral expert group chaired by Annie Sugier, as President of the North Cotentin Radioecology Group, to give a ruling on the receivability of the danger and impact studies supplied as part of the draft file submitted by COGEMA in support of its requests (ruling also requested from the Institute for Nuclear Safety and Protection in parallel).

15/9/98: Note from the DPPR (the department of the French ministry of environment in charge of control of hazards and pollution) indicating that, although there was no legal obligation, the submission of a discharge authorisation application would appear to be necessary, particularly to "properly inform the public".

13/10/98: Ruling by the group of experts that COGEMA's draft file was not receivable as it stood and identification of the minimum additions required.

22/10/98: Ruling by the Institute for Nuclear Safety and Protection that COGEMA's draft file was not receivable as it stood and request for justification of the nominal discharges proposed, as well as additional calculations.

30/12/98: Submission to the French Nuclear Safety Authority of a new draft of the licensing authorisation decree file by COGEMA.

31/12/98: Request for a ruling by the multilateral expert group on the modifications made to the draft file by COGEMA (the same request made by the Institute for Nuclear Safety and Protection).

27/1/99: COGEMA supplied the French Institute for Nuclear Safety and Protection with two preliminary safety analysis files in support of the licensing authorisation decree.

29/1/99: "Not unfavourable" ruling by the group of experts on the receivability of the draft file, while emphasizing that some parts of the file required improvement.

4/2/99: "Not unfavourable" ruling by the Institute for Nuclear Safety and Protection on the receivability of the draft file, clearly indicating what improvements to the file it expected.

Feb. 99: The French Nuclear Safety Authority requested COGEMA to supplement a draft file addressing the rulings of the Institute for Nuclear Safety and Protection and the group of experts.

8/7/99: Letter from the French Nuclear Safety Authority to the group of experts requesting the group to give a self-contained ruling and specifying that "a discharge authorisation request, even though it may be desirable, could not be imposed under the law".

20/9/99: Letter from Madame Lauvergeon to the Ministers for the Environment and Industry, officially transmitting the file requesting modification of the licensing authorisation decree for three COGEMA-La Hague facilities. The request "intended to enable COGEMA to adapt the general conditions of use of these facilities to reflect expected changes in the nature of the spent fuel and the treatment requirements of other types of effluents or specific types of waste" and stating that "the opportunity was taken of making a complete review of the impact study, analysing the consequences for the environment of all the activities conducted at the La Hague site".

29/10/99: Letter from the French Nuclear Safety Authority to Madame Lauvergeon indicating its formal agreement on forwarding the file to form the basis of the public inquiry.

23/12/99: COGEMA supplied the French Nuclear Safety Authority with the preliminary safety analysis reports associated with the request for modification of the licensing authorisation decrees.

2/02/00: Opening of the public inquiry (extended until 17 May 2000).

29/02/00: The Standing Group for Plants requested by the French Nuclear Safety Authority to examine the documents submitted by COGEMA concerning modification of the licensing authorisation decrees.

8/03/00: Publication of the report by Michèle Rivasi of the Parliamentary Office for the Assessment of Scientific and Technical Options on "Consequences of nuclear waste disposal facilities on public health and the environment".

27/04/00: Letter from the French Nuclear Safety Authority to the Institute for Nuclear Safety and Protection stating the terms and conditions of the action of the Institute for Nuclear Safety and Protection in support of the safety authority in the context of analysis of the applications for authorisation of intake of water and discharges of effluents from licensed nuclear facilities. It was stated that the authority "must assess whether the request is legitimate and comprehensive… (and) thus make sure that the file submitted at the public inquiry is correct in both form and substance".

16/05/00: Letter from the French Nuclear Safety Authority to the Institute for Nuclear Safety and Protection stating that, in parallel with the procedure concerning the request of modification of the licensing authorisation decrees for the COGEMA La Hague facilities, "the safety authority considers that revision of the COGEMA La Hague establishment discharge authorisations is desirable" and therefore requests the Institute for Nuclear Safety and Protection to give its ruling "on the technical basis to be adopted for setting the limits for the radioactive component of the releases".

26/06/00: Report of the Public Inquiry Commission, including a "Question and Answer" appendix prepared by COGEMA.

24/07/00: New North Cotentin Radioecology Group mission relating to analysis of the uncertainties associated with assessment of the radiological impact and study of the impact of chemical releases.

25/09/00: Letter from the Institute for Nuclear Safety and Protection in response to the request from the French Nuclear Safety Authority concerning the technical basis for setting the discharge authorisations, giving "an analysis of the operating envelope requested by COGEMA without changes in the processes currently used and examination of avenues of progress for the short term (the next three years) or the longer term, capable of further reducing the levels of radioactive releases".

28/09/00: Letter from the French Nuclear Safety Authority to the Institute for Nuclear Safety and Protection requesting "impact calculations, for the five groups selected (…) corresponding to the limits for liquid and gaseous discharges" mentioned in the letter.

19/12/00: Letter from the Institute for Nuclear Safety and Protection to the French Nuclear Safety Authority giving the results of the calculations using two options for the discharges of carbon-14 (all released in the liquid effluents or partly in the liquid effluents and partly in the gaseous effluents).

Jan. 01: Distribution of the Institute for Nuclear Safety and Protection Safety Assessment Department report No. 247 giving the ruling of the Institute for Nuclear Safety and Protection on the documents relating to the request of modification of the licensing authorisation decrees for the COGEMA La Hague facilities.

17/01/01: Meeting of the standing group to consider the preliminary safety analysis reports associated with the request of modification of the licensing authorisation decrees of the COGEMA facilities, and statement of a ruling.

Dec. 02: Publication of the reports on the second mission of the North Cotentin Radioecology Group.

10/01/03: Publication of the order modifying the COGEMA La Hague facility licensing authorisation .

E. THE REAUTHORISATION OF RADIOACTIVE DISCHARGES FROM THE DEVONPORT ROYAL DOCKYARD IN UK

1. BACKGROUND AND HISTORICAL CONTEXT

The British Royal Navy has used the dockyard at Devonport, Plymouth, for over 300 years. The dockyard is in the city and close to the city centre. Historically, the dockyard has been very important economically to the city but with less people employed at the dockyard than before, the city's dependence on the dockyard as a source of livelihood is reduced. Figure 1 shows the Plymouth area and the sea inlet called the Hamoaze; the dockyard is situated on the east bank.

Nuclear-powered hunter-killer submarines have been refitted at the Devonport Dockyard since the 1970s. In 1987, a private company, Devonport Management Limited (DML), took over the refitting from the Royal Navy. Shortly after, the British Government decided that refitting of nuclear weapon-carrying nuclear-powered submarines ("Vanguard class") should be moved from Rosyth and also be carried out at Devonport. Although the interviews carried out in this work show that the presence of a nuclear facility in Plymouth has always been a source of concern, the connection between nuclear weapons and Vanguard class submarines increased the potential for controversy surrounding the dockyard, even though it was stated that there was no intention of bringing the weapons to Devonport when the submarines arrived for refitting. Thus, potentially, the refitting of Vanguard submarines moved from a local concern over radioactive discharges to a national and even international source of controversy.

Industrial and environmental aspects

Refitting Vanguard class submarines required a large investment in infrastructure but also a change in the radioactive waste streams from the dockyard. This change required a re – authorisation from the Environment Agency under the Radioactive Substances Act 1993 (as amended), as DML is a private company and not exempt as a Defence organisation.

The discharges of some radionuclides, notably tritium, were set to increase. Additionally, some years before, it was identified that significant quantities of the radionuclide ^{14}C were in waste from refitting; as this had not been reported previously, some media coverage and controversy resulted. Information on the then standing discharge limits, the discharge limits originally requested by DML and the final discharge limits proposed by the Environment Agency, taken from (EA, 2001 p85) are given in Annex 1. Figures for other UK site may be found in (FSA and SEPA, 2001).

Legal aspects

Regulation of radioactive discharges to the environment in the UK is by the Radioactive Substances Act 1993, as amended; principally by the Environment Act 1995 that set up the Environment Agency of England and Wales. A particular feature of the Radioactive

Substances Act 1993 is that Defence installations are exempt from its provisions, so the Act only applies to that part of the dockyard run by DML and not to that part of the dockyard still run by the Royal Navy. Therefore, by privatising part of the dockyard, the UK Government made the refitting process newly liable for regulation by the normal, civil procedures. This step seems to have made the regulatory process regarding submarine refitting more open, although it was not the primary motive for the privatisation.

As far as discharges to the environment are concerned, policy pursued under the authority of Radioactive Substances Act 1993 means that regulation in this area is generally consistent with the European Union's Euratom Basic Safety Standards Directive 1996, although some changes are being considered by the Department of the Environment, Food and Rural Affairs. The Government has strategic control over policy because it has the power to issue guidance to the Environment Agency.

The Environment Agency have considered justification in similar authorisations, which is an obligation under Radioactive Substances Act 1993 following a ruling in a judicial review in 1994 of the Government's decision to authorise discharges from the THORP reprocessing plant at Sellafield (the 'Potts Judgement'). The Government has since indicated that decisions on justification should be taken by the Secretary of State. The important point for this case study is that the question of justification (i.e. the justification for the UK's nuclear attack capability) was not within the remit of the Environment Agency and they did not consider this issue.

Authorisation is required for discharges from new processes or if there are significant changes to existing ones, such as variation in the nature of the discharge or if there is a change in ownership. Authorisations are also reviewed from time to time, approximately every five years. Policy pursued by the Environment Agency requires operators to use best practicable means to minimise the waste produced and discharged to the environment, with the overarching aim to ensure exposure of the public is as low as reasonably achievable.

Under the Radioactive Substances Act, the Environment Agency is obliged to consult the Health and Safety Executive and the Food Standards Agency regarding authorisations to discharge radioactive waste and additionally local authorities, water management bodies and, if judged appropriate, other public and local authorities. However, the Environment Agency decided to go beyond the regulatory requirements and launched a programme of engagement and consultation with the public. It also moved to issuing one authorisation for all of the waste streams, to enable it to take a more holistic view of the discharges. The reasons for this unilateral decision by the Environment Agency to actively engage stakeholders, greatly beyond the minimum required of it, as well as its implications and effectiveness, will be explored in the following text.

The final decision on granting authorisation resides jointly with the Secretary of State for Health and the Secretary of State for Environment, Food and Rural Affairs; they may decide to accept the Environment Agency's proposed decision or they may 'call-in' the authorisation application to decide themselves or (more likely if the decision is called in) hold a public enquiry into the application.

2. DESCRIPTION OF THE RISK GOVERNANCE PROCESS

2.1. The risk governance process

The governance process studied was that surrounding the authorisation of discharges of radioactive waste from Devonport Royal Dockyard by DML, brought about by the refitting of the Vanguard class submarines, in addition to hunter-killer submarines. However, interviews with stakeholders have highlighted that this quite discrete process was part of an ongoing relationship; whilst focus here will be maintained on DML's application discussion will be extended where the authors feel it is appropriate.

In May 2000, DML applied to the Environment Agency under Radioactive Substances Act 1993 to vary its authorisation to dispose of gaseous, liquid and low level solid radioactive waste. In fact, this application was foreseeable some time in advance of this, when the contract for refitting Vanguard class submarines was awarded to DML.

From interviews with Environment Agency staff, it appears that the Environment Agency believed that the application by DML would be controversial. Recognising this, the Environment Agency launched a public engagement and consultation exercise, with the stated objective of ensuring that when they proposed a decision to the Secretaries of State, it was informed by concerns of the local community and other stakeholders (EA, 2001 p85). The objectives and issues at stake will be discussed in the following section.

Following receipt of the application, the Environment Agency held meetings in early June 2000 with the local councils, Caradon District Council and Plymouth City Council, to describe what DML were proposing through their application. A public meeting was held in Plymouth on 20th June 2000, which the Environment Agency tried to ensure was widely publicised and was attended by over 200 people (EA, 2001 p84). Minutes from this meeting were placed on the public register. Additionally, the application and other relevant documents, such as the Environment Agency's requests for further information, were placed on the public register. DML's responses to requests for further information were received by the Environment Agency over the second half of 2000, with the last response in January 2001.

The public consultation was launched on 5th March 2001 and originally was scheduled to last three months. The Environment Agency emphasised that it had not made any decision regarding the authorisation at this time. A second public meeting was held in Plymouth on 29th March 2001 and was attended by over 400 people (EA, 2001 p87). In addition, the Environment Agency held 'surgeries' where members of the public could walk in and discuss DML's application with Environment Agency staff on a one-to-one level. These surgeries were held in Plymouth and also Saltash and Torpoint, communities near to the dockyard but on the opposite side of the Hamoaze and over 50 people attended (EA, 2001 p87).

The Environment Agency put documents relating to application, including the application itself, on the public register and in public libraries within a 25km radius of Devonport and on its internet site. The Environment Agency also posted the package of

documents to anybody who requested them. Requests were accepted by telephone, fax, email or letter, and responses to the consultation documents could be made by the same channels.

The consultation period was originally set to finish on 4th June 2001. However, a report on the incidence of cancers around Plymouth by the local Health Authorities was published at the end of May 2001; the consultation period was extended to 4th July to allow consultees' responses to take the report into account. In fact, the Environment Agency stated that they also took into account responses after the closing date, up to the point where the proposed decision document was finalised and published (EA, 2001 p5).

The proposed decision document was published in November 2001 and the Environment Agency's proposed decision received the approval of the Secretaries of State in February 2002, who at the same time commented on the issue of justification.

2.2. Participants and resources of the risk governance process

A number of key participants have already been mentioned; in this section their overall role will be described, as will that of other players.

The central participant in this process is the Environment Agency; as the regulator for radioactive discharges from the part of the Dockyard run by DML, it had to be involved in this process. The Environment Agency went beyond the minimum, legal requirements for consultation and so was the 'driver' for this discrete process. The Environment Agency is a large but relatively new organisation set up outside Central Government with the vision that it would be a guardian for the environment and promote or protect recreational use and sustainable development. From discussions with Environment Agency staff, the organisation does see itself as independent. This 'fresh start' and independent outlook perhaps contributed to the Environment Agency's motivations to consult both in the sense of wanting to be open and from the pragmatic view that it did not want to lose public confidence through having to make a potentially controversial decision.

In terms of resources, some of the expenses will have been levied from DML as provided for under the 'polluter pays' principle, therefore the pressures may not have been as severe as otherwise would have been the case. However, the Environment Agency does now expect to hold stakeholder engagement and consultation programmes in controversial cases and presumably have made some allowances for this – the view being that in the longer term, it is cheaper to get the best decision first time (EA, 2003).

During the consultation, the Environment Agency made efforts to answer queries and comments, making use of external experts where it felt that it did not have the appropriate expertise in-house. In these cases, the question was referred to the relevant recognised body such as the National Radiological Protection Board, a public body responsible for providing advice on radiological protection. In particular, the NRPB were asked for their views on research papers highlighted by stakeholders in the

consultation, on concerns about the level of risk from low levels of radiation and on exposure through ingestion and inhalation as opposed to external exposure.

Local Health Authorities also provided their views on DML's application and in response to concerns raised by respondents to the consultation. In particular, the joint response of the then South and West Devon, and Cornwall and the Isles of Scilly, Health Authorities to the consultation was high profile and its release at the end of May 2001 caused the Environment Agency to extend its consultation period.

Regional Health Authorities (now re-organised into Strategic Health Authorities) are part of the UK's National Health Service and as such are public bodies responsible for health strategy, such as setting priorities and monitoring performance, at a sub-national level. Regional Health Authorities were attached to the local hospital and care infrastructure and through this attachment were probably perceived as relatively independent from Central Government.

DML is the organisation which operates the nuclear facility which the application for discharge relates to and so in some respects is the key player. However, although DML carries out the refitting, the submarines belong to the Royal Navy who therefore had a strong interest in the process. Perhaps even more than the Royal Navy, the Ministry of Defence has an interest because of their policy-setting role and because of their control of funding. It is the Ministry of Defence's responsibility to make sure that the submarines are maintained and available for the Navy to operate. The responsibilities of the Ministry of Defence mean that it is centralised and has traditionally been relatively secretive. The other stakeholders did not always fully distinguish between these three stakeholders; the authors feel in some cases this was partly because the distinctions were not seen as meaningful.

Several non-organisational stakeholders[50] had a high profile involvement in the process. All of these stakeholders who were contacted in this study already had concerns regarding the dockyard, generally pre-dating its take-over by DML. Therefore, it probably fair to say that from their point of view, the consultation process studied offered an opportunity to raise their concerns and have them taken into consideration in the risk governance process. From discussion with interviewees, the authors believe they have spoken to the main non-organisational stakeholders in the process and, more importantly, captured the breadth of opinion but the attendance at the two public meetings demonstrates a wide level of concern and potential for controversy.
Local councils did not have a direct role in the decision making for this governance process but nevertheless are interested parties because the discharges present a risk to the people they represent and also because the dockyard is a major employer in the area. Plymouth City Council also has a role in emergency planning, should there be an

[50] In this chapter the term refers to active stakeholders who were not directly or necessarily involved in the authorisation application through their employer i.e. in the category loosely referred to as non-governmental organisations but including individuals and not including DML (who are a non-governmental organisation).

incident at the dockyard with off-site consequences and so has some involvement with the dockyard outside the particular risk governance process studied here.

Similarly, local Members of Parliament did not have a direct, statutory role in this consultation but have an interest because they represent people who live in the vicinity of the dockyard, who may raise concerns with them. Potentially, a Member of Parliament has influence on such a process, albeit indirectly, through having a voice in Parliament.

2.3. Issues at stake

The risk governance process studied is centred on the authorisation submitted by DML. Without the authorisation, it would in practical terms have been impossible for DML to refit the Vanguard class submarines.

Views were expressed, and have been to the authors, that the Environment Agency were always going to grant the authorisation due to pressure from Central Government. Conversely, the Environment Agency insisted that it would judge the authorisation on its merits; discussion with the local Environment Agency staff has given the authors the impression that these staff would have challenged the authorisation had they felt it necessary.

In fact, UK regulators tend to use negotiation in the first instance rather than opting straightaway for a blank refusal. A direct refusal would have been politically controversial and perhaps even politically dangerous for the Environment Agency. A more likely scenario is that objections or conditions put forward by the Environment Agency would have caused DML to re-think their authorisation application and perhaps the processes involved in refitting, possibly also requiring the direct involvement of the workplace safety regulators, the Nuclear Installations Inspectorate, and led to significant delays and increased costs[51]. The timing of the refitting of the Vanguard class submarines has important implications for the UK's strategic defence policy and therefore DML were under considerable pressure to have their application approved in time. Arguably, the issue of time was more important for DML than increased expenditure because the Ministry of Defence could potentially supply additional money more easily than additional time. Therefore DML staff involved in the authorisation were under pressure to make sure that application went through smoothly and was correct (as an incorrect application would lead to significant delays).

For the Environment Agency, the issue at stake was largely one of credibility. It believed that the DML authorisation would be controversial and therefore arouse the interest of large numbers of people. Therefore the Environment Agency was keen to legitimate its decision by taking into account concerns outside its own and those of the

[51] One of the Environment Agency staff interviewed has since commented that an outright refusal would not be possible without strong supporting evidence and a corresponding audit trail. They also pointed out that even in this situation, they would want consultees' views. They confirm that the 'more likely' scenario described would be the first step.

other bodies that it had to consult. They also recognised that a pro-active approach was required to involve people; consultations are common in the UK but are often very passive meaning that people may miss their opportunity to comment, or may be unwilling or unable to seek information and supply written comments. The importance of credibility should not be underestimated: the setting up of the Food Standards Agency independently of the Ministry of Agriculture, Fisheries and Food and the later dissolution of that Ministry, the replacement of Railtrack by Network Rail and the controversy surrounding these moves show the consequences of public loss of trust. From a pragmatic point of view, it is also easier to 'police by consent' than in a highly-charged, confrontational environment. On this last point, the Environment Agency had to strike a balance to also retain credibility with those it regulates and other regulators.

Similar comments apply to involvement of the Health Authorities and the local councils; the organisations felt that they needed to appear informed and involved to avoid having their credibility eroded. In a more passive way, the same applied to local Members of Parliament. However, all of these three groups had legitimate interests in the application albeit perhaps indirectly.

For the non-organisational stakeholders interviewed, the issue at stake was the continued presence, in the area where they lived, of a nuclear facility that they felt posed a significant threat to the health of the local community; especially because of its presence adjacent to a city centre. DML's application particularly added to concern because it proposed increases in discharges of radionuclides (mainly tritium) into the environment. In all cases, these stakeholders recognised the importance of economic well-being for the area although there was variation in how this was viewed against the risk the site posed, partly because of different perceived levels of risk and hazard. Based on interviews, these stakeholders were self-selecting, at least originally, becoming involved because they felt that somebody needed to scrutinise or challenge the levels of nuclear safety at the dockyard. The implication of this is that they felt that not enough was being done in this area and so felt the need to take on an active role themselves.

Views of the general public have not been sought directly but some deductions can be made based on the interviews carried out and on documents produced by the Environment Agency, including transcripts of the two public meetings. Based on this, the authors feel that the range of views have been captured.

The health effects of low levels of radiation were consistently raised and questioned by non-organisational stakeholders (including the public). In particular, one stakeholder group claimed that radiation from the dockyard had led to a high rate of cancers in Plymouth (a 'cluster'), based on information obtained from the Department of Health. The significance of the local Health Authorities' response was that it consisted of an analysis of the occurrence of cancers in the region and concluded that radioactive discharges from the dockyard had not caused a cancer cluster in the area. This report was endorsed by COMARE, an advisory committee set up by the Government to provide independent advice on the medical aspects of radiation. Importantly, the Health Authorities' report used the established radiation dose-harm model when analysing mortality rates.

The Environment Agency also elicited opinions from the NRPB and Somerset Health Authority on research papers put forward by non-organisational stakeholders which argue that the risks from low levels of radiation are underestimated by currently accepted methods.

A key point here is that there was disquiet surrounding the technical basis for predicting a low risk from the discharges, which varied from being an initial unfamiliarity with radiological dose to dispute over the models and evidence used to calculate the risk. The Environment Agency clearly did not consider itself the appropriate body to judge the detailed evidence, so that whilst *it* accepted alternative evidence, it may have appeared not to have done because it took advice on the evidence from another public body, the NRPB, who then effectively dismissed it. Any recommendation for an open re-examination of the evidence by the authors has been pre-empted by the Government, who set up a national committee to look into this issue. The committee, 'CERRIE', was set up in the second half of 2001 and includes academics and representatives from the nuclear industry, public bodies and organisations which have questions about the currently accepted radiation-harm model.

2.4. Analysis by the stakeholders

2.4.1. Environment Agency

This section is based on interviews conducted with a number of Environment Agency staff directly involved with processing the authorisation application.

As stated by a senior member of staff, the aim of the Environment Agency in the authorisation was to protect the environment and human health but they also wanted a process that could be regulated effectively and efficiently. The staff also seemed to feel that dialogue with local people about controversial decisions was in the culture of the Environment Agency and that the Environment Agency would be willing to communicate beyond the minimum required in such cases. A member of staff with a role in communications and public relations added that a desirable objective of the governance process was to maintain or enhance the reputation of the Environment Agency; this is evidence that the Environment Agency recognises the importance of credibility.

The Environment Agency oversaw the risk governance process through a project board and the staff interviewed rated this as very useful because it drew together staff with a range of backgrounds and, in the words of one member of staff, helped everybody to keep focus, or in the words of another gave people a 'reality check'. From the interviews, the project board appears to have been a useful mechanism for free and frank discussion, and ensuring the differing aspects of an issue – legal, technical and communications – were considered. Staff also mentioned that written minutes were kept to provide an audit trail and that in addition to the permanent members, other members of staff could be co-opted to the board if required.

Staff either implicitly or explicitly accepted the timescale for the process, recognising the need to make a decision at some point. However, it was also plain that the staff would not have been ruled by a timetable (as indicated by the extension of the consultation period). Staff felt DML had gone with the risk governance process run by the Environment Agency but thought that towards the end, DML were feeling the pressure to get the authorisation, and felt that they had had to take a more direct line with DML than during most of the process.

Early on in the process, project board meetings tended to focus on issues surrounding communication and perception: the project team wanted to ensure that they engaged the public, particularly local people, and tried to publicise the consultation and the accompanying public meetings and surgeries. Related to this, one member of staff pointed out that local campaign groups tended to have good ideas for publicity and also benefited the process by stimulating debate. The staff also emphasised that they tried to provide information in an accessible, understandable way and to tailor the style of presentation to suit the particular audience.

The staff thought that their efforts at publicity and communication had been effective, although they were not complacent and in fact the Environment Agency has commissioned research into its performance in this area. They recognised publicity of events and their choice of venue was important not just to maximise engagement but also as a defence against accusations that people were not aware of the events or could not reach the venues; at least one respondent did raise this point. The staff seemed to feel that by the end of the process, the majority of the interested public had respect for the Environment Agency's position on DML's application, even if they did not like it. It was recognised by staff that there would be individuals or organisations that were never likely to be content about the discharges from the dockyard but they felt that it was important to keep a dialogue open with such people and organisations, rather than cutting them off.

With regard to public meetings, the staff interviewed were unanimous in commenting that they felt these meetings were necessary. The reasons for this were associated with the openness and transparency of such events. Generally, though, the staff felt public meetings were less effective for 'reaching out' to people. Reasons mentioned included lack of confidence on the part of some people, who may feel intimidated by more outspoken or apparently knowledgeable attendees and that meetings can be 'hijacked' by a vociferous minority, perhaps with a particular point to make. Staff felt that the choice of layout and location of meetings was important; in particular, it was mentioned that in the first meeting, all of the speakers were seated together on the platform. The speakers included DML and Royal Navy as well as Environment Agency representatives and staff realised that the first impression of attendees may have been of the regulators and the regulated sitting together separately from the public. Although, strictly, the Royal Navy were not the subject of regulation by the Environment Agency, staff did not seem to think the distinctions between DML, the Navy and the Ministry of Defence were properly understood by many people.
In contrast, the one-to-one discussions possible at surgeries were felt to be much better for having a dialogue with members of the public and allowed engagement with people who for various reasons may not have spoken out at public meetings. Staff generally

reported a deeper level of discussion at surgeries but it was noted that they could present logistical problems: at one surgery forty people arrived, more than expected and on occasions people may have had to wait to speak to an Environment Agency employee, only to find that there was no-one present with the necessary expertise. Nevertheless, staff gave the impression that surgeries added real quality to the process. Staff also said that they were always prepared to consider communicating through less formal channels, although they had to exercise care to ensure even-handedness.

The project board did make use of the media, through press releases, publicity and training staff in media relations but did not perceive the media as hostile. The project board had tried to make sure that they had suitable, pre-prepared material but also tried to be quick to react to circumstances to avoid a build-up of tension or controversy.

Some tension between the need to legally discharge statutory responsibilities and the desire to communicate was detected in interviews with staff. The importance of the legal position was universally recognised but, in a reflective mood, a member of staff commented that perhaps a higher quality, more honest dialogue could be held if regulators could move away from the necessary position of independent arbiter, unable to express an opinion until making their final decision, to a more two-way process of 'well, this is how we see the situation, what do you think?'

The Environment Agency's experience of the process may be summarised by the following comments on it by one of the interviewees: 'Mostly positive. A rocky road to start with but positive comments towards the end'.

2.4.2. DML

The following description of the viewpoint of DML on the risk governance process is based on interviews with several members of staff, including a representative of the Trade Union Side.

There was recognition from the staff (including staff at a senior level) that the consultation surrounding the authorisation application had had an important role in securing approval from the Environment Agency. They realised the application was likely to be controversial, particularly because of the increase in tritium discharge limit. Staff felt that although the consultation process was time consuming, it was less time consuming than delays that could have occurred if there was no dialogue, or in being granted an authorisation that was so controversial that they would have had to repeat the process in a year or two. Following on from this point there was a recognition that, even aside from any moral or ethical concerns, safety was important to DML because a poor safety record would affect new business and be expensive in terms of delays and time lost. Implicitly or explicitly, the staff seemed to feel that some sort of deadline to the process was needed; this is not unexpected given the contractual nature of their business and the national security imperative.
Based on interviews with staff, a major cause of worry for DML was the uncertainty of the process although their judgement was that, on balance, they thought the process could be brought to a conclusion within a timescale that was acceptable for them. One

member of staff observed that at times, they had felt like spectators to the process, with no control over it despite it being very important to DML.

DML felt that the level of trust was lower pre-1987 but also thought that it was easier for them to be open than the Royal Navy and Ministry of Defence who ran the dockyard previously. Related to this, staff said that they thought the takeover by DML had introduced a more open culture.

Although DML's primary motive had to be having an authorisation approved which would allow them to refit Vanguard class submarines, their aims for community relations were not (necessarily) to change people's minds but to demonstrate that DML was a responsible, professional and human organisation. One member of staff said that there would be many people for whom they could never completely remove concerns but that they could try to give these people confidence in their (DML's) management of the situation.

A senior member of staff commented that for around the first five years of management, DML were learning what worried the community and that the consultation surrounding the authorisation application had to be seen in the context of an ongoing dialogue. Staff said that they continued holding meetings with local campaign groups and Plymouth City Council; they said their view was that they would show the campaign groups anything they wanted as far as the law allowed them. A member of staff said that because DML's workers live within the local community, not being open with the community would in any case be unrealistic. Another member of staff said that meetings with the local community could be useful for early identification of potentially contentious areas. Two interviewees mentioned contact with local schools and also suggested open days or roadshows to improve communication with the public.

Staff said that they had used their own experience and that of others, particularly a then recent authorisation at the Atomic Weapons Establishment, Aldermaston to help them go through the risk governance process. For the latter, staff said that the Atomic Weapons Establishment had not been adequately prepared for a public meeting and that DML had benefited from having a better working relationship with the Environment Agency. However, staff commented that conveying technical arguments was challenging, partly because of striking the balance between making the arguments easier to understand and oversimplifying them to the point of patronising the audience. A senior member of staff also said that they had taken a decision not to respond to what they viewed as more sensational claims about the dockyard and DML. DML considered whether to use a professional public relations team but in the event decided to keep it 'in-house'. The authors speculate that this in itself may have been wise from a public relations point of view, although this was not mentioned or implied by any of the DML staff. One member of staff commented that it was helpful to have support from the Ministry of Defence.

The staff felt that at the first public meeting, the majority of the audience were unhappy with the application and staff said that the meeting was difficult because they saw people becoming increasingly frustrated at points. The staff commented that on several occasions, questions were not answered there and then but were noted down for a later

response and thought that sometimes this may have been frustrating for people. However, the staff said that the Environment Agency staff were very professional in the public meeting and generally, and thought that the Environment Agency handled the process very well. Amongst those individuals and organisations with concerns, the staff identified two broad categories: firstly, local people with concerns over risk and health for the community and secondly, a category with a national and international agenda regarding nuclear weapons. The staff felt that it was well known and understood that nuclear weapons were not brought into, or stored, in the dockyard and thought this may have been why this second category was not obvious at the outset of the process. It was felt that the journalists had not always made this distinction, although it was acknowledged that this could be difficult for them.

The Trade Union Side with the interests of their members in mind, seemed supportive of the application. However, it was made clear that the application document and surrounding information had been scrutinised, including reports on occurrence of cancers in the areas, and that views amongst the membership had been listened to, which suggests that it would be unwise to assume unconditional support from the Trade Union Side. It was mentioned that often people are not aware of the array of information available to them. The Trade Union Side had also had a presence at meetings with external groups and public meetings and helped provide information to answer queries to a local Member of Parliament. The Trade Union Side perceived the Environment Agency as helpful and as a source of information.

Overall, DML saw that the application process was a ‘spinal cord that other issues could hang off’ (DML, 2002) and that the consultation surrounding it presented a good opportunity for views to be aired. The general feeling seemed to be that the process worked and was less painful than anticipated but because of the uncertainty involved for DML and associated stress for the staff, no-one was keen to go through the experience again in the near future.

2.4.3. Royal Navy

The Royal Naval officer interviewed noted that since the application had to be made by DML, the Ministry of Defence locally and centrally adopted a supportive role[52]. This involved the provision of information, advice and an attendance at the major public meetings. The officer thought that a genuine effort had been made to listen to people’s concerns and that officers involved felt involvement had been ‘interactive’ and not just transmitting views. The availability and involvement of experts was seen as beneficial and the officer felt that queries had been responded to in an understandable way. It was mentioned that about the third of the time in a meeting with external stakeholders on another topic (related to nuclear submarines) was in fact spent on discussion of DML’s authorisation application. The authors see this as evidence that there was potential for the application to become highly controversial and also that the application was one point, albeit potentially a critical one, in a broader, ongoing situation. The officer also

[52] Technically, the Naval Base works for the Warship Support Agency, part of the Defence Logistics Organisation, which in turn is a department of the Ministry of Defence.

pointed out the vulnerability of public meetings to being ‘hi-jacked’. With respect to deadlines, whilst it was recognised that interest groups provided a positive input in that they provided informed questioning and a focus on alternative solutions, the nature of some of the discussions and questions was such that it caused considerable time pressures within the consultation period.

2.4.4. Non-organisational stakeholders (1) School Governing body

This section reports the viewpoint of a member of the Governing body of a local school, four hundred metres from the dockyard. Governing bodies oversee the running of a school at the strategic level (but not day-to-day), including responsibility for health and safety there. Governing bodies are multi-partite and include political, parent and staff representatives; the role is unpaid. The Governing body in question also represents the interests of three other local schools in the area on matters relating to nuclear safety.

The Governor interviewed stated that their interest was the health and safety of the pupils and staff at the school. The Governor said that it was important for parents to have confidence in the ability of the school to ensure the welfare of their children and that ensuring their safety was a key part of this. The school has an alarm to warn of a nuclear incident, which is tested monthly, and carries out regular drills. Iodine tablets are also kept at the school, at the insistence of the Governing body; previously the emergency plans were for tablets to be distributed by the authorities in the event of a nuclear incident.

The Governor said that it was important for the dockyard to build confidence amongst the local community and noted that accountability was important. Following on from this, communications with the local community were seen as important; in this respect DML were seen as better than the previous Royal Navy – Ministry of Defence regime, and the Governor also perceived a difference in cultures between them. From the interview, the authors conclude that the Ministry of Defence is not seen as entirely trustworthy and seen as quite ‘closed’ and remote. In contrast, the local staff (including DML and the Royal Navy) are held in much higher regard but the impression remains that key decisions are taken away from Plymouth, which potentially reduces the value of trust in the local staff.

The Governor recognised the economic importance of the dockyard, both direct and indirect, particularly as the area served by the school is relatively deprived. For this reason, the Governor said that the continued existence of the nuclear facility could be tolerated *provided* that it was safe (and seen to be so). However, the Governor was not in favour of any new nuclear facilities in the area.

It is clear that the Governor saw the process surrounding the authorisation process as one point in an ongoing situation. Several other events were mentioned, some of which were very recent at the time of the interview. A proposed project related to storage and maintenance of armaments in the area was mentioned. The consultative process by the Royal Navy around this was seen as insufficient and the project was stopped; the useful role of local Members of Parliament, who became involved, was commented on.

The Governor said that the surgeries seemed to be valuable because they allowed ‘good points’ to be raised that would have been missed at public meetings. Overall, the Governor felt that people had had an excellent opportunity to comment during the consultation. The Environment Agency was seen as acting in the public’s interest and having performed well during the consultation; one comment was that the Environment Agency provided a useful means of eliciting information from DML and the Ministry of Defence. The Governor said that they had good relations with – and respect for – Plymouth City Council whilst the local Health Authority had improved. The Governor had sought information regarding the alleged ‘cancer-cluster’ from the Environment Agency and the Health Authority and felt, on the current evidence, that the allegation was not well founded. However, the Governor was aware of CERRIE (see above) and was clearly aware of current developments surrounding the dockyard and radiation generally. In short, the Governor maintains a high level of vigilance.

Overall, the Governor’s conclusion was that consultation works if it is open and all possibilities are considered and, moreover, that it is now expected.

2.4.5. Non-organisational stakeholders (2) Local campaigner

This interviewee is very concerned about the dangers of radiation, from the dockyard in particular. The interviewee played an active part in the consultation as a locally resident individual but was aware of the national-level interest and, in some cases, had had contact with nationally known figures in the field.

The interviewee had been interested in the dockyard and DML for some years but was particularly concerned about the increase in discharges of tritium and increases in airborne discharges proposed in DML’s authorisation application. Several papers were cited to the authors that suggested that tritium is more harmful than currently accepted models predict. The authors note here that at least one of the research papers was presented to the Environment Agency who passed it on to the NRPB, as discussed elsewhere.

The interviewee was also concerned about current levels of safety and security, mentioning a recent, relevant incident in this area, and possible future developments at the dockyard. In particular, there was concern that the current presence there of nuclear submarines which have exceeded their operational lifetime could lead to Devonport being chosen as a site for decommissioning the submarines. Concerns over DML’s senior management were also raised, citing past incidents involving DML’s foreign parent company. DML was recognised as an ‘astute’ company but one that persisted in running a nuclear facility adjacent to a city centre; the dockyard’s economic importance was recognised but it was suggested that they could make bigger efforts to move to non-nuclear business.

The interviewee felt that the Environment Agency and the Health Authorities may have been under some pressure when assessing the health risks from the radioactive discharges, with the implication that the Environment Agency had little real choice in

its decision[53]. Additionally, it was felt that the Environment Agency's arguments were weak in places and that some points had not been adequately considered. The interviewee also mentioned that three months after the Environment Agency's consultation period had finished, the Health Authorities released another report which showed tritium as posing a higher risk than previously thought (i.e. the same bodies whose response to the Environment Agency's consultation found there to be no 'leukaemia cluster' in the Plymouth area, as discussed elsewhere).

The interviewee recognised that the issues surrounding the dockyard were not all straightforward but believes that they should have been better shared and discussed. The authors' impressions are that this interviewee appreciated the opportunity to air concerns but felt that the consultation was not sufficient in its coverage of issues and in its potential to genuinely have an impact on decisions.

2.4.6. Non-organisational stakeholders (3) Local campaign group

This part of the case study reports the views of members of a local campaign group that was very active during the consultation surrounding DML's application, with concerns about the health and safety implications of the nuclear facility and the discharges.

The issue of decommissioning nuclear submarines there originally aroused the members' interest in the dockyard. Following the start up of the group, it was realised that there were many other issues, for example, storage, discharges and accidents. Particular points mentioned included DML's foreign owners, assumptions made in the public emergency plan and that even minor incidents at the dockyard indicated a lack of control on the part of management. The group realised that the campaign would be long term as they felt they could not 'win against the Ministry of Defence'; rather the members said they wanted to raise public awareness.

The members of the campaign group were particularly concerned about the proposed increase in discharges of tritium. They had heard that there was a school of scientific thought that was unhappy with the currently established model for estimating harm from radiation and cited or submitted such work, and a study about accident risks, to the Environment Agency. The members were critical of 'the Establishment', including the Environment Agency, because they felt that evidence that did not fit in with the model currently used by the NRPB was not given due consideration. It was also pointed out that radiation doses arising from the dockyard were in addition to background radiation.

Previous comments notwithstanding, the authors' impression is that the interviewees had some trust in the Environment Agency, particularly in its motives and the motives of locally based staff, and said that it appeared to be open but were not convinced that it was immune to pressure from Defence interests. Furthermore, it did not appear that the members of the campaign group had a high level of trust in the Ministry of Defence.

[53] This interviewee has since commented that the Environment Agency's independence may also be questioned because it makes decisions consistent with statutory guidance from Central Government. The authors note that statutory guidance expresses high-level, national policy.

Interestingly, the campaign group members' perception was that safety was reduced with DML because of short term-ism associated with its concern with commercial issues but they felt that they were beginning to build up a relationship with DML. The campaign group meets with DML quarterly but had the perception that the onus was on them in the relationship. The members also had concerns over the depth of sincerity of DML with regard to its community links.

The interviewees believed that organisations such as theirs had a valuable role to play in ensuring that issues were debated but pointed out that as a small, voluntary organisation, there could be resource difficulties in keeping fully informed and attending all relevant meetings.

The members said that the application had raised the profile of safety issues at the dockyard and that they had differences of opinion with the Environment Agency over the net benefit (or otherwise) of approving the discharge application. At the time of the application process, the campaign group obtained statistics from the then Department for the Environment, Transport and the Regions on cancer mortalities in the Plymouth area. They believed these statistics indicated the presence of a cancer cluster in the area, which they suspected was caused by radiation from the dockyard, as discussed elsewhere in this report (together with the report on the same topic by the local Health Authorities).

With respect to the public meetings, the members felt that people had become angry because they felt that 'the Establishment' had regarded some of their questions as non-scientific or not relevant. The campaign group had tried to keep to 'moral' arguments (i.e. the risk of cancer from radiation exposure) rather than challenging DML on its 'own ground' of scientific and technical detail.

In summary, the campaign group appreciated the opportunity that the consultation had given them to express their views but had concerns over the extent to which their participation in the consultation had influence on the final decision making process.

2.4.7. Plymouth City Council official

The official interviewed was involved in the City Council's actions around and responses to DML's application. Plymouth City Council was the lead local authority for the application and also has responsibilities regarding emergency planning. Plymouth City Council has had significant involvement with nuclear and radioactive issues involving the Submarine Refitting Complex due to prior consultations and planning applications.

The official pointed out that the City Council had no active, statutory role in processing DML's application although it was a consultee. However, the Council felt and recognised that it had responsibilities under the general duty of social, economic and environmental well-being to protect the population and it was clear that the population looked to the council to fulfil this role. Therefore the Council made clear that it would allocate resources to reviewing DML's application and took the line that it would support the application only if it was satisfied there was low or no risk to people and the

environment. Plymouth City Council took the view that the statutory regulator (the Environment Agency) as the independent body was best placed to determine the application but that the responses and views of Plymouth City Council should help them to finalise their decision.

The Council had past experience of good relationships with campaign groups and its staff attended public and informal meetings as well as facilitating access to information. The official said that the Council was still in contact with the Environment Agency and a local campaign group to monitor the implementation of the conditions within the discharge consent authorisation.

The consultation was recognised as being effective and open, particularly regarding public meetings but surgeries were also felt to be important. The official commented that it helped to think through handling of up-and-coming issues and that pro-active discussion helped. The official's perception was that locally there was limited trust in the Ministry of Defence, based on past experience. From the interview, the authors also conclude that DML sometimes does not seem to be fully aware of the impact its news or actions will have, or else, how it should best present them; it was pointed out that the sensitive nature of the application required careful and honest public relations.

The official commented that comparisons between anthropogenic and natural exposures to radiation were of limited value because the area has a high background level of radiation and that exposure from discharges is not a voluntary risk. A further interesting comment was that the benefits of a process need to be emphasised to win a debate over its acceptability but over-reliance on economic arguments was not likely to be effective. The official noted that council officers had clearly identified the difficulty in rational debate on radiation issues with the general public and felt that the Council had a strong record of independent review of the nuclear operations in the dockyard.

The official felt that positions of mutual respect and understanding had built up over the consultation and that this had benefited the process and that this would be beneficial in handling any future issues surrounding the refitting complex. The official felt that establishment of public confidence and the confidence of opposition groups in the role of the Council and its officers is a key point in how such applications can be handled.

2.4.8. Local Member of Parliament

Local Members of Parliament did not have a direct, statutory role in the application process but, as representatives of their constituents, had an interest in it and consequently some involvement. The local Member of Parliament interviewed was generally recognised by those interviewed as having had a high level of involvement in the consultation.

The Member of Parliament explained that their constituency was relatively deprived and had a relatively small number of people directly employed by the dockyard and commented that because of the reduced economic dependency on the dockyard, people felt more able to voice any concerns. Following the submission of DML's application, the Member of Parliament was briefed by the Environment Agency and discussed how

the Agency proposed to conduct its consultation to ensure that those who might not contribute in public meetings could have an opportunity to discuss their concerns. The Member of Parliament had other sources of information, including around half a dozen constituents who correspond fairly regularly regarding the dockyard. In this sense, the Member of Parliament had a 'radar' to detect potential problems or controversy surrounding the dockyard. To assist in response to queries from constituents, the Member of Parliament had prepared information sheets on the application for discharge. The Member of Parliament also had a role in conveying directly to Ministers in relevant departments constituents' concerns with the issues and the process.

Overall, the Member of Parliament thought the consultation was effective in that it had brought people 'inside the tent' but would like to see DML, as an organisation, strengthen its commitment to community relations.

2.4.9. Local Health Authority professional

This part of the case study reports views and comments from a local Health Authority professional involved in the risk governance process. The local Health Authorities' role in the governance process was as a statutory consultee but in the event, as already discussed, their response to DML's application was high-profile and resulted in the extension of the consultation period.

The professional said that the Health Authority recognised that the dockyard, and so DML's application, was a high-profile issue in the area and were therefore particularly keen to ensure that they were able to provide a robust, defensible view on the application, whether for or against approval.

The professional said that the timescale was adequate, although extracting the appropriate information from third parties had taken longer than anticipated and that they sensed that the Health Authority's views were keenly awaited amongst certain stakeholders.

The Health Authority covering Plymouth produced a response jointly with the then separate but adjacent Health Authority covering Cornwall. The Health Authorities accepted the dose assessments as provided by the Environment Agency and instead concentrated on comparing the expected leukaemia occurrence based on the doses with the actual occurrence of leukaemia in the area, on the basis that leukaemia is the cancer most likely to be caused by radiation exposure. The professional was aware of the claim by a local campaign group that there was a cancer cluster in the Plymouth area but said that their own study had not borne this out.

The professional said that they had received a number of queries from the public and in one case had even requested (and received) an activity-specific dose assessment from the Environment Agency. Most attention for their work had been from local and, to a certain extent, national campaign groups. The professional had the impression that DML and the Royal Navy worked closely together and commented that the local emergency planning group had a good working relationship.

The professional noted that the local experts were to be moved from the locally orientated National Health Service to a nationwide, and thus centralised, national health protection agency[54]; the authors comment that it would be interesting to examine the difference in trust or regard for the unit as it potentially starts to be perceived as part of a central Government organisation rather than one that is locally based and directed.

3. ANALYSIS OF THE RISK GOVERNANCE PROCESS

3.1. The guiding principles of the decision-making process

3.1.1. Rationale of the risk governance principles behind the decision making process

The basis of the risk governance process relates to calculated risk to humans from radiation, as described in the introductory section. The Environment Agency have widened this to ensuring that concerns of the public and other non organisational stakeholders are considered i.e. societal concern has now become a direct input into the process as well as 'objective' risk.

3.1.2. Objectives of risk governance

For the Environment Agency, strict objectives of the risk governance are to reduce the risk to humans as low as is reasonably achievable subject to certain factors: firstly there are limits and constraints on the doses that members of the public may be exposed to and secondly, even if the exposure levels are very small in terms of risk to humans, the operator is still expected to use the best practicable environmental option to minimise discharges. Thus the nominal objective is to lower radiation doses to humans by controlling routes and levels of discharges. As noted, it appeared that this 'cold' scientific approach was becoming less satisfactory to the local community on its own and the objective of the Environment Agency's consultation programme was effectively to gain legitimacy for this approach and to identify and address any factors which it had not already taken into account. The trend is also towards explicit protection of the environment, its flora and fauna, which is presently done implicitly through controls on risks to humans.

3.1.3. Contribution to the improvement of governance of hazardous activities

From a scientific point of view, the legal and policy basis of the governance were adequate to control the risks to humans and drive improvements on the part of the operator. The consultation process studied here broadened this to creating mechanism for identifying and addressing societal concerns; the Environment Agency appear to have been meticulous in answering concerns raised in the consultation. Potential

[54] The local unit of the National Health Service, in this context the local Primary Care Trust still has the responsibility for the health of the local population; the new organisation will provide support and advice to the Primary Care Trust on the type of issue discussed here.

blockages for a consultation leading to a legitimated decision were that the Environment Agency's responses might still have relied too strongly on scientific arguments or were inadequately explained; where it sought advice it was a hostage to the level of trust in the advisor (e.g. passing queries to the NRPB for response); that some of the questions were outside its remit and it could not legitimately answer them (e.g. justification); finally, that the process would not reach a conclusion. The whole process was vulnerable to delays, particularly likely to arise from public discontent and media controversy (e.g. causing the Government to 'call-in' the application and launch a public inquiry or it simply not being approved by the Secretaries of State) or through legal challenges, as appeared to be a threat towards the end of the process.

3.2. The role of expertise

3.2.1. Identification of uncertainty

Uncertainty was a key issue for some stakeholders because they challenged the empirical basis as well as theoretical aspects of the dose-harm model used. This uncertainty was not identified as such because the discussion was essentially adversarial i.e. 'your model says the risk is this. Our model says the risk is much higher'. However, the setting up of CERRIE shows that this uncertainty was recognised on a national basis.

3.2.2. Are dissenting views encouraged? How are they reported?

Dissenting views were picked up, recognised and efforts were made to try and answer them. From interviews, it appears that on a local level, dissenting views are 'actively tolerated' in that the industry and regulatory side make some effort to keep in contact with 'dissenters' or at least to accommodate them. During the consultation, the Environment Agency seems to have thoroughly recorded queries and its responses to them, which were published in its document explaining its proposed decision and the reasons behind it (EA, 2001). Current mechanisms are less clear, although locally any potential controversy surrounding the dockyard is likely to be newsworthy.

3.2.3. To what extent are facts and values distinguished?

The basis of the radiological dose assessments did not seem to be seriously challenged and in this sense were regarded as, more or less, factual. The main debate centred on the amount of harm arising from the doses; because disagreement remained on this risk, the debate never fully moved on to how much risk should be accepted and so this value judgement was not properly explored. However, the authors' views are that conceptually distinction between facts (how large the risk is from a given radiation dose) and values (how much risk should be tolerated) was made implicitly on all sides. Mention was also made of radiation as a pollutant of the environment (rather than as a risk to health because of its presence in the environment) and, again, the authors' impression is that this was implicitly recognised as a separate, value issue.

3.2.4. How are the role and scope of expertise defined?

Definition of the role of expertise was implicit; it was accepted that experts carried out the assessment which was then consulted on and further expertise elicited in response to concerns raised in the consultation. The Environment Agency's project board largely defined the scope of particular expertise because they commissioned expertise – internal as well as external – to analyse DML's application and to answer queries. Thus, broadly, expertise was used to inform the debate; this applies to the manner in which diverging expert opinions were viewed.

3.2.5. How do experts declare their interests?

Most of the experts involved worked for public bodies and the role of their organisations were described. Declaring interests was not such an issue for these people, the question was how independent of Government and, particularly, how immune to influence from the Ministry of Defence the organisations were seen to be. The 'dissenting' experts are nationally known figures in their field and it was rather previous publications that were presented than direct evidence from the experts themselves. Thus the organisational stakeholders will have been aware of their interests and background but the general public were probably not.

3.3. The stakeholders involvement process: influence of stakeholders' watchfulness on trust and confidence

3.3.1. Why is stakeholder involvement needed?

Stakeholder involvement was felt to be necessary to avoid the potential blockages described above. Additionally, the Environment Agency's culture seemed to be one that presumed a certain level of openness and willingness to listen to concerns.

The stakeholders involved and their roles have already been described.

3.3.2. How are stakeholders encouraged and enabled to take part in the decision-making process?

The means for doing this have been described but the important point is that stakeholders *were* encouraged and that this was done in a way that enabled them to participate in a range of ways and localities, and was done with the aim of ensuring stakeholder involvement, particularly amongst non-organisational stakeholders and the public. Consultation often takes place but tends to be limited to selected organisations or is rather formal or low profile, or a combination of these.

3.3.3. What is the aim of the stakeholder involvement process?

The intention of the Environment Agency was not to delegate the decision but to ensure that all factors were considered by the Environment Agency; presumably the strength of opinion may also have influenced the weighting the Environment Agency gave to particular factors. A large part of the consultation was communication: explaining to concerned individuals what the application meant and what the Environment Agency believed the health implications of the discharges were. In this sense the aim was to inform as well as listen. The efforts to make the process open and even-handed were to legitimate the decision and associated with this, to improve confidence (or at least trust[55]) in the organisation and its decision. The non-organisational stakeholders, DML and the Royal Navy also saw trust or confidence as important features of the dockyard's existence. For the non-organisational stakeholders, confidence in the dockyard operations did not exist but they wanted to be able to trust the dockyard and their concerns related to wanting to be in a position where they trusted DML.

The process itself appears to have been valuable because although people and organisations may not have had their opinions taken on-board, it appears they generally thought that they had had the opportunity to raise concerns and have them answered (although perhaps not always to their satisfaction). Judging from the fact that application was approved quite rapidly, and from anecdotal evidence from the Environment Agency and others, the consultation seems to have been reasonably successful in addressing the concerns of many people. However, as one of the interviewees has since commented, there is still concern amongst local people over the ongoing operations of the dockyard and Naval Base, with associated decisions or proposals continuing to attract interest.

3.4. The factors integrated into the decision framing and decision taking processes

3.4.1. Extent of social trust

As discussed, a suspicion that social confidence and social trust were weak was a major reason for the Environment Agency to embark on its consultation programme; even if social trust or confidence in the dockyard were not improved, it would certainly be in the regulator's interest to maintain or improve trust or confidence in itself. This improvement or maintenance is of benefit to a regulator by allowing it to regulate efficiently and thus – given that the regulator is technically effective – of some benefit to society. The dockyard suffered from a legacy of mistrust due largely to the popular image of the Ministry of Defence and the fact that it possessed a nuclear facility, which tends to generate more concern.

[55] Here 'confidence' is not being worried (e.g. not to worry that the plane you are on will crash) and 'trust' is having concerns but believing that others control them adequately (e.g. to worry that the plane you are on might crash but to believe that the aircrew's, ground staff's, design engineer's etc. training and procedures are enough to make a crash extremely unlikely).

3.4.2. Extent of uncertainties

The relevant uncertainties have been discussed and largely relate to the basis for the dose-harm model that is currently accepted.

3.4.3. Nature and complexity of the problem

The decision was potentially highly controversial but for most stakeholders, the complexity of the underlying issues was not problematical, requiring some perception of the risk, both in absolute terms and balanced against the economic well-being of the area. However, explaining the technical issues was recognised as challenging by several stakeholders including the Environment Agency, DML, the City Council and the local Member of Parliament and the level of understanding of these issues might be expected to alter people's perceptions of the risk.

3.4.4. Dilemmas and trade-offs

Although both the Environment Agency and DML embarked on the consultation program, both did so with some trepidation. Each was faced with a decision to embark on, or – for DML – co-operate with, the process knowing that it could spiral out of control but had to weigh this risk against operating in a hostile environment with low credibility. For the non-organisational stakeholders, there was relatively little in the way of dilemmas and trade-offs, with the exception of the school Governor and the governing bodies that they represented. The Governor had to decide between the level of safety for the pupils as well as their general welfare which is related to the economic well-being of their families and community. The Governor also wanted parents to have confidence in the school. The Governor's approach to this dilemma was to try and ensure that the safety threat was so low that they did not feel obliged to object to the operation of the nuclear facility; maintaining a high level of vigilance was part of this.

3.4.5. Importance of reaching broad agreement

For the Environment Agency to continue operating with the same level of trust and confidence, and for DML to continue smooth operation, it was necessary for the large majority of people to broadly accept the Environment Agency's decision. However it was not important to reach agreement of, or acceptance by, all stakeholders; indeed, it appears that several stakeholders see benefit in having some openly 'dissenting' views.

3.4.6. Benefits and justification

The economic benefits to the area were clear, although the dockyard is less important than previously. A line of argument recognised by several stakeholders was the 'reverse' argument on its benefit that, given that the submarines had to be refitted somewhere, there was no net dis-benefit. This argument was not considered very relevant to the consultation which focussed on local effects but was a defence against OSPAR and the general presumption that discharges will reduce. Other benefits are

related to justification and whether one feels that possession of a nuclear-armed submarine fleet constitutes a national benefit; the Government argued in its approval for the authorisation that it did and was legitimated by the Government's democratic mandate. The Government also stated that, in any case, it did not regard justification as applying to defence matters in strictly legal terms.

3.4.7. Sustainable development

The Environment Agency is legally committed to promoting sustainable development but sustainable development did not appear as a significant issue in this case study.

3.4.8. Equity

This issue did not appear directly regarding the application but it is interesting to note that some stakeholders said that the Plymouth area should not be exposed to risk from any new facility, which invokes the concept of equity (or NAIMBY: Not *All* In My Back Yard) as well as of societal risk because of the large population.

3.4.9. Usage of scientific information and expert advice

Scientific information and advice provided the basis for explaining the issues and for most debate surrounding the application as this was used to deduce environmental concentrations, radiological doses and their associated level of harm. The advice and information used was elicited and presented in an open way. However, although the authors believe the Environment Agency set a good example of how to obtain and present advice and information in an open and transparent way, some stakeholders felt that they did not access a broad enough base of information and expertise. In fact, as has been described, the Environment Agency did take alternative research and information in but delegated its analysis to other organisations, such as the NRPB. Whilst it seems reasonable that the consultation was not extended, say, to a detailed discussion of the dose-harm model with the NRPB and COMARE (holding a national level debate as a 'daughter' consultation to the essentially local debate) the Environment Agency nevertheless risked not being seen as allowing consideration of 'dissenting' views. To some extent therefore, levels of trust in the Environment Agency depended on third parties.

Generally, the expert input was provided initially and then as and when necessary to address specific issues raised and thus contributed to answering people's concerns (albeit not to everyone's satisfaction) and either allowing an informed debate or, for some people, reassurance.

3.4.10 Sensitivity to the local context

The consultation programme was tailored to the specific locality in terms of scale and types of approach. This tailoring was benefited by the structuring of the Environment Agency into regions so that the staff involved were locally-based. Similarly, most of those involved, and all of those interviewed, were locally-based.

3.4.11. The cost of protective measures

Features of regulation are the concepts of practicability and proportionality. The first says that if it is not unreasonable to implement a measure, it must be implemented; the second qualifies the practicability: crudely, the larger the risk the more an operator is expected to spend to reduce it. Therefore the cost of measures are considered but, unless subject to a legal challenge, there is some latitude for the regulator to insist on measures and therefore in this type of case the balance struck will depend on the Environment Agency's perception of what is practicable.

3.4.12. Subsidiarity and local norm-setting

As discussed, the process took place at the local level which seems appropriate as any health effects will be at a local level. However, the consultation process did not seem to perform as well with regard to national (or international) issues such as the dose-harm model and justification, although in fairness it was not designed to do so as these are viewed as outside the Environment Agency's remit. For justification, the issue was raised by respondents and answered by the Secretaries of State and thus had some outlet. The dose-harm model is being dealt with at a national level which, the authors believe, is more appropriate. There is no formal opportunity for local norm-setting in terms of dose but the discharge quantities allowed were based on a site specific assessment and this provides a mechanism for local control.

3.4.13. Differentiation of stakeholders

The Environment Agency sent out information prior to and during the consultation period explaining the roles of the various organisations, including those providing expertise, such as the NRPB. One may assume that the Environment Agency staff also explained roles of those involved if questioned. However, it is not clear how widely and how well this information was understood. Also, it seems to the authors that in some cases certain distinctions were not regarded as meaningful, such between DML, the Navy and the Ministry of Defence.

3.5. The implementation of decisions and review

3.5.1. Mechanisms for revising decisions

Legally, any significant change to the nuclear processes and waste streams would require an amendment to DML's authorisation, or a new authorisation. The Environment Agency also has regulatory powers which allow some responsiveness within an existing authorisation.

3.5.2. Review of implementation of decisions

As a condition of their authorisation, DML are required to report their discharges and to monitor radioactivity in the environment. The Environment Agency inspects the site,

the discharge reports and carry out their own monitoring. A further public body – the Food Standards Agency – also carry out monitoring and retrospective assessments of dose to the local population. These reports are in the public domain. Additionally, authorisations are reviewed around every five years.

4. SUMMARY

DML's contract to refit Vanguard class nuclear powered submarines, in addition to Trafalgar and Swiftsure class submarines, meant DML made an application for authorisation for radioactive discharges that implied increased discharges of certain radionuclides, although there was no change or reduced limits for most.

The Environment Agency carried out an active stakeholder engagement programme surrounding the application because it felt that the application would arouse controversy. The consultation programme went far beyond that required by law, with the regulator making a concerted effort to reach the local community. This contact created a direct input for the local community's concerns surrounding the application and, as it turned out, the dockyard in general.

The process appears to have helped prevent a 'blockage' in decision-making through communication, building of trust or confidence and allowing views to be aired. However, there continues to be identifiable stakeholders that still have a high level of concern; there is still contact between these stakeholders and DML and there is recognition that the existence of these views can be helpful.

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ANNEX E1 DISCHARGES FROM DEVONPORT AND COMPARISON WITH OTHER SITES

Table A1 Gaseous discharge limits for DML

Radionuclide or Group of Radionuclides	Annual Limit
Tritium	4 GBq
carbon-14	43 GBq
argon-41	15 GBq
beta/gamma activity associated with particulates	0.3 MBq

Source: Environment Agency's proposed decision document

Table A2 Limits for aqueous discharge from DML to the Hamoaze

Radionuclides	Annual Limit (GBq)
Tritium	700
Cobalt-60	0.8
Carbon-14	1.7
*Other radionuclides	0.3*

* excludes tritium, cobalt-60 and carbon-14

Source: Environment Agency's proposed decision document

Table A3 Limits for aqueous discharge from DML to the sewer

Radionuclide	Annual limit (GBq)	Specific Activity Limit
Tritium	2	4 MBq/m3
Cobalt-60	0.35	
*All other radionuclides	0.65	

* excludes tritium, cobalt-60 and carbon-14

Source: Environment Agency's proposed decision document

Table A4 Activity limits for transfer of solid waste from DML

Radionuclide or Group of Radionuclides	Annual Limit, GBq	
	Transfer to BNFL at Drigg or Sellafield	Transfer to UKAEA at Winfrith
Cobalt-60	15	90
Tritium	10	10
Carbon-14	10	10
Other radionuclides[2]	15	90
Uranium	Nil	Nil
Radium-226 plus Thorium-232	Nil	Nil
Other alpha emitters[1]	Nil	0.02
Iodine-129	0.02	0.02

Source: Environment Agency's proposed decision document

[1] "other alpha emitters" means alpha-emitting radionuclides with half lives greater than three months excluding uranium, radium-226 and thorium-232

[2] "other radionuclides" means:

(a) iron-55 and beta-emitting radionuclides with half-lives greater than three months unless individually specified in this Table and

(b) any other radionuclides specified in writing by the Agency

Table A5 Activity limits for transfer of very low level waste

Radionuclide or Group of Radionuclides	Annual Limit MBq
All radionuclides	100

CASE STUDIES CONCERNING THE DIALOGUE PROCESS IN A REGIONAL OR INTERNATIONAL CONTEXT

F. MANAGEMENT OF AIR QUALITY AROUND THE INDUSTRIAL SITE OF ETANG DE BERRE IN FRANCE

1. INTRODUCTION

The Etang de Berre is located in the south of France, close to Marseille. This area presents a very high density of industries: oil refineries (Total, Elf, BP,...), chemist industries (Oxachimie, Naphtachimie,…), electricity production plants (oil-fired power plants - EDF)…. The concentration of industries leads to the emission of many air pollutants (SO_2, O_3, NOx…).

Figure 1. Location of Etang de Berre

The objective of this case study is to analyse the dialogue structures set up at the local and regional level, dedicated to the management of air pollution, and more precisely to the management of Sulphur Dioxide (SO_2) releases (Permanent Secretary for Industrial Pollution Problems, Local Commission of Information…).

The releases of SO_2 are mainly due to the use of sulphured fossil fuels (coal, lignite, oil coke, heavy fuel oil, domestic oil, diesel oil). Some industrial processes are also at the origin of SO_2 releases (production of sulphuric acid, production of wood pulp, oil refining…). The main contributors are usually coal-fired or oil-fired power plants, refineries, and the large burning plants. The level of SO_2 pollution is measured in terms of concentration in the air ($\mu g/m^3$). The evolution of SO_2 concentration in the air can evolve with the meteorological conditions. The Table 1 presents the evolution of the SO_2 releases for the main industries located in the area of Fos-Etang de Berre.

The SO_2 is an irritant gas. It affects the pulmonary defence and increases the respiratory and cardiovascular existing diseases. The epidemiological studies presented by the World Health Organization (WHO) in its publication on Air Quality Guidelines for

Europe[56] concerns mainly the effects of sulphur dioxide when it is associated with the presence of particulate matter. High concentrations over 24 hours can lead to an increase of the mortality (total, cardiovascular and respiratory) and of the number of hospital emergency admissions for total respiratory causes and chronic obstructive pulmonary disease.

The presence of SO_2 can also affect the environment: in case of humidity, SO_2 forms sulphuric acid contributing to acid rains and to damages on stones and materials of some buildings. Acid rains can result in harmful impacts on the vegetation and change the soils characteristics.

Table 1. Evolution of SO_2 releases between 1994 and 2001

Industry	Sector of activity	1994 (tonnes)	2001 (tonnes)	Evolution 2001/1994
BP Lavera	Refinery - Petrochemistry	19 737	12 272	- 38%
TOTAL La Mède	Refinery	10 817	11 837	+ 9%
SOLLAC	Steel industry	12 710	11 172	-12%
SHELL Chimie	Petrochemistry	15 845	8 898	- 44%
SHELL oil refinery	Refinery	19 040	6 910	- 64%
NAPHTACHIMIE *	Petrochemistry	3 714	5 485	+ 48%
ESSO	Refinery	6 132	5 197	- 15%
CABOT France	Chemistry	2 551	2 108	- 17%
EDF Ponteau **	Oil-fired power plant	310	1 953	+ 530%
TOTAL		**90 856**	**68 832**	**- 28%**
Mean tonne/month		**7 571**	**5 486**	
Mean tonne/day		**252**	**183**	

Source : Etat de l'environnement industriel - DRIRE PACA - 2002

* NAPHTACHIMIE : Increase of a capacity of production

** EDF Ponteau : the year 1994 is not representative as the power plant was in operation only during a limited number of hours

[56] World Health Organization - Regional Office for Europe, **Air Quality Guidelines for Europe**, Second Edition, WHO Regional Publications, European Series, No.91, 2000.

2. BACKGROUND AND CONTEXT

2.1. Historical context

This paragraph aims at introducing the events that lead to the creation of the Permanent Secretary for Industrial Pollution Problems (the SPPPI)[57]. The historical context presented here allows to better understand the way the various dialogue structures that play a major role into air pollution concerted management around the Etang de Berre have been created. Further details on the functioning of those structures are outlined in Chapters 3 and 4.

2.1.1. Creation of the French Ministry for the Environment

The French Ministry for the Environment was created in 1971, on the 7th of January. Jacques Poujade was nominated at the head of this new Ministry. Among its scope of activities, management of industrial sites or other institutions listed for their potential impacts on the environment was a major concern.

One of its very first actions was to try to avoid a strong social conflict due to the creation of a new harbour industrial area at Fos-sur-Mer. At this time, the development of a competitive French iron and steel industry was strongly supported by the French President, Georges Pompidou, who was convinced by the irremediable decline of the Lorraine industry and the need for building new complex for iron and steel industry near the places where the ore was discharged. From this point of view, Dunkirk and Fos-sur-Mer areas were selected.

2.1.2. Local protesting against the industrial area at Fos-sur-Mer

Jacques Poujade asked to the state representative of the Country, the Prefect, to write down a report on the current situation and its prospects. At the same time, two commissions, the OREAM – Organisation for Studies on the development of Marseille - and the MAEB – Mission for Development of the Etang de Berre area - achieved first proposals for the priority actions and studies to be carried out for the management of the area located around Fos-sur-Mer. These commissions where composed of administration representatives.

The Prefect created four commissions on air, water, urbanism and nature reserves in February 1971 to answer the Minister request. Those four commissions were composed by OREAM, MAEB and Marseille harbour representatives, and representatives of the various public institutions concerned by the project. But there was no local elected representative. The reports were achieved in August 1971 and the Prefect addressed them to the Minister in September 1971.

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[57] Secrétariat Permanent pour les Problèmes de Pollution Industrielle, **30 ans de concertation : le SPPPI ; 10 ans de communication : le Cyprès - Rétrospectives autour de la sécurité et de l'environnement industriels en Provence-Alpes-Côte d'Azur,** novembre 2001.

At the beginning of 1972, the Prefect sent the final report to local elected people and to professional organisations. The report was discussed during an assembly of local elected people in April 1972. Observations of fifty municipalities closed to Fos-sur-Mer and NGOs were taken into account. The debate was rather strained. But all the decisions dealing with pollution management around Fos-sur-Mer had already been taken at the national level

At the same time, while the four commissions were working, population concern for pollution problems was growing up. A local NGO for pollution study and health care (AFNPS) was created in February 1971 to record the evolution of the living conditions in the city of Fos-sur-Mer.

In the spring 1971, the MAEB commission presented a first project for urban development of the area located on the west coast of the Etang de Berre. In this report, the project of urban development of the Fos-sur-Mer municipality was particularly low compared to other larger municipalities (Martigues, Arles…).

The mayor of the Fos-sur-mer, J-J. Féraud, who was not consulted by the MAEB, protested against the project. The director of the MAEB wrote him a letter explaining that the pollution associated with the future industrial complex was not compatible with a harmonious development of his city. Furious, J.-J. Féraud forwarded the letter to the media, to Jacques Poujade and to the Prime Minister and he decided to dismiss from his political party to protest against the policy of the Government. The local problem quickly turned into a national affair as somehow it could be considered as a protest against a project strongly supported by the President.

2.1.3. Creation of the Permanent Secretary for Industrial Pollution Problems (SPPPI)

The Schnell report

Considering the situation, the Minister of Industry and Jacques Poujade decided together to send a small group of experts to study the problem and to propose solutions at the end of October 1971. The group led by M. Schnell gave his report 15 days later. Actually, it was quite important to avoid any decisions linked to the growing fear of pollution that could block further industrial developments in the area of Fos-sur-Mer.

A major proposal of the report was the creation of a Permanent Secretary for Industrial Pollution Problems (SPPPI) in order to:

- Conduct the investigations for the delivering of planning permissions, authorisation for water taking, authorisation of opening for industrial sites listed for their potential impacts on the environment,
- Define a coherent environmental policy,
- Look for the possible ways to reduce the pollution,
- Animate a public information centre on pollution and the measures that are taken to reduce it.

Further proposals were made:

- Fixing of an objective for SO_2 release before the 1st of January 1973,
- Experiment of a process aiming at decreasing sulphur release from thermic power plant,
- Creation of a network for the atmospheric pollution measuring,
- Study of the current and foreseen quality of the water of the Etang de Berre and the gulf of Fos.

Proposal made for the creation of the SPPPI was debated within several Ministers who finally adopted it (and the other proposals of the Schnell report). The Prefect officially created the SPPPI on the 14th of February 1972. The SPPPI was composed of four commissions in charge of air quality, underground water quality, the Etang de Berre water quality and the Gulf of Fos water quality and a central office with public institutions representatives. The OREAM commission was in charge of the creation of a public information centre.

The SPPPI was an innovative structure with no legal status. But in fact, even if its creation was due to the local political protesting, as soon as public institutions representatives took on all the responsibilities, the creation of the SPPPI led to the reinforcement of the “central administration power” in the field of pollution prevention.

Once more, J.-J. Féraut sent a letter to J. Poujade to protest against the creation of such a structure with no representatives of the local population. As a consequence, local elected representatives from Marignane, Martigues, Vitrolles, Saint-Chamas... were involved in the four commissions.

Sulphur dioxide emissions have been recognized as a major issue since the creation of the SPPPI. The following paragraph illustrates the actions carried out by the SPPPI in order to limit the release of sulphur dioxide in the atmosphere.

Several industrial plants (oil refinery, chemical plant, thermic power plant) started operations within 1971 – 1972. As a consequence, sulphur dioxide (SO_2) releases into the air increased: 250 tons per day in 1970, 300 tons per day in 1971 and 470 tons per day in 1972. SO_2 impacts on health and environment (acid rains) were known but there was clearly no quantitative information to fix an objective in terms of emissions or concentration in the air. The Ministry for the Environment, together with the industry representatives' and the local elected representatives, adopted a limit of 800 tons per day of SO_2 releases into the atmosphere. Furthermore, it was decided to decrease SO_2 releases by 50% by the end 1975 and 90% by the end of 1978 (considering as a reference the year 1972). In 1983, emissions did not exceded 400 tons per day.

Another goal of the policy initiated at the beginning of the Seventies was to limit the occurrence of high pollution events. In case of high acid concentration in the atmosphere, it should be asked to the operators to reduce their SO_2 emissions by the use of low sulphur concentration fuel or the reduction of their operations. These procedures could clearly not function without an efficient measure of SO_2 concentration. Thus, at the same time, a network for atmospheric pollution measurement was progressively put

on (40 measurement devices by the end of 1972). AIRFOBEP, Association in charge of the surveillance of air quality, was officially created in June 1972. A major part of the cost of the network was funded by the operators. Since 1971, there has been a continuous effort to develop and to improve the quality of the network.

Considering the health impacts, several studies have been carried out in order to get data on the impact of atmospheric pollution on human health since 1974[58]. The PAARC study[59] (1974 – 1976) showed the link between SO_2 concentration in the atmosphere and respiratory infections. Other studies were carried out in Gardannes (1983- 1984) - where a thermic power plant is located - and around the Etang de Berre (1993 – 1994). Both led to the same conclusions than the first study quoted above, the last one was very discussed and criticised. Recently, a national study[60] carried out by the French "Institut National de Veille Sanitaire" (National Institute for Health Monitoring) between 1997 and 2002 led to the following results:

- There is a linear relationship between atmospheric concentration of several pollutants (SO_2, NO_2, O_3) and the rate of mortality (from cardio-vascular and respiratory diseases) ,
- This relationship is not site-dependent,
- An excess of mortality can be evaluated.

A new SPPPI working group (Air and health) devoted to this topic was created in 2002.

Finally, it should be quoted that in 1989, as a result of the European SEVESO directive, an information centre called CYPRES was created in Martigues, mainly to improve the access of the local population to information on industrial risk activities and environmental protection in the region.

2.2. Political and legal context

2.2.1. European Directive on ambient air quality assessment and management

Within the framework of the fifth action plan for the environment, the aim of the European Community was to carry on the actions linked to environmental problems and to set up new relations between the stakeholders in the sector of the environment. Thus, the Council adopted a Directive[61] in September 1996 concerning the assessment and the

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[58] AIRFOBEP, "Problématique régionale de la qualité de l'air - étude bibliographique", décembre 1998. AIRFOBEP Web site : http://www.airfobep.org/

[59] Pollution Atmosphérique et Affections Respiratoires Chroniques ou à Répétition (PAARC), Groupe coopératif PAARC, Bull. Europ. Physiopath. Resp., 1982, 18, 87-99 et 101-116.

[60] Institut National de Veille Sanitaire, "Programme de surveillance Air et Santé 9 villes", juin 2002.

[61] Council Directive 96/62/CE of 27 September 1996 on ambient air quality assessment and management, Official Journal of the European Communities L 296, 21/11/1996, P. 0055 - 0063.

management of ambient air quality. It provided the foundations of a common strategy aiming at defining and laying down objectives related to ambient air quality. As specified in the Article 1, "The general aim of this Directive is to define the basic principles of a common strategy to:

- Define and establish objectives for ambient air quality in the Community designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole,
- Assess the ambient air quality in Member States on the basis of common methods and criteria,
- Obtain adequate information on ambient air quality of the air and ensure that it is made available to the public, inter alia by means of alert thresholds,
- Maintain ambient air quality where it is good and improve it in other cases."

This Directive gives a list of atmospheric pollutants (including Sulphur Dioxide) for which the Commission will have to submit limit values and alert thresholds for ambient air. It also requires the Member States to draw local, regional or national programmes for improvement in the ambient air quality.

The Directive establishing the limit values for Sulphur Dioxide was published in 1999[62] (see Table 2).

Table 2. Limit values for Sulphur Dioxide set by the European Directive 1999/30/EC

	Averaging period	**Limit value**	**Margin of tolerance**	**Date by which limit value is to be met**
1. **Hourly limit value** for the protection of human health	1 hour	**350 μg/m³** not to be exceeded more than 24 times a calendar year	150 μg/m³ (43 %) on the entry into force of this Directive, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2005.	1 January 2005
2. **Daily limit value** for the protection of human health	24 hours	**125 μg/m³,** not to be exceeded more than 3 times a calendar year	None	1 January 2005
3. Limit value for the **protection of ecosystems**	Calendar year and winter (1 October to 31 March)	**20 μg/m³**	None	19 July 2001

[62] Council directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air, Official Journal of the European Communities L 163, 29/06/1999, P. 0041 - 0060

The Directive also establishes an alert threshold for Sulphur Dioxide ("level beyond which there is a risk to human health from brief exposure and at which immediate steps shall be taken by the Member States"). This level is equal to 500 $\mu g/m^3$ measured over three consecutive hours.

2.2.2. French law on "Air and Rational Use of Energy"

The adaptation of the European Directive 96/62/CE on ambient air quality to the French law was made through the framework law on "Air and Rational Use of Energy"[63] the 30 December 1996. This law recognizes for everyone the right to breath an air which does not harm its health. This law makes mandatory:

- the monitoring of air quality by the State;
- the establishment of air quality objectives, alert thresholds and limit values in accordance with the European Directives, or with the WHO recommendations for the substances not regulated by the European Commission;
- the public information.

The monitoring of air quality is delegated to specific associations, subject to an agreement by the ministry of environment[64]. The limit values for air pollutant are set by specific decree. As far as Sulphur Dioxide is concerned, the limits have been published in 2002[65] . These limits correspond to those published by the European Commission (see Table 2). They will be applied the 1st of January 2005. Moreover, the decree set:

- an air quality objective: 50 $\mu g/m^3$ on average over the calendar year (corresponding to the WHO recommendation),
- an information/recommendation threshold : 300 $\mu g/m^3$ on hourly average,
- an alert threshold: 500 $\mu g/m^3$ measured over three consecutive hours (corresponding to the European Directive).

This law also envisages some measures to guarantee the quality of the air. In particular, a Regional Plan for Air Quality of (PRQA - *Plan Régional de la Qualité de l'Air*) must be established by the Prefect of each administrative region in France. This plan must lay down the main orientations to reach the air quality objectives, to prevent or reduce atmospheric pollution or to reduce the impact of this pollution. The plan has to be revised each 5 years.

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63 Loi n°96-1236 du 30 décembre 1996 sur l'air et l'utilisation rationnelle de l'énergie, Journal officiel n°1 du 1er janvier 1997, p. 11.

64 Décret n°98-361 du 6 mai 1998 relatif à l'agrément des organismes de surveillance de la qualité de l'air, Journal Officiel du 13 mai 1998.

65 Décret n°2002-213 du 15 février 2002 portant transposition des directives 1999/30/CE du Conseil du 22 avril 1999 et 2000/69/CE du Parlement européen et du COnseil du 16 novembre 2000 et modifiant le décret n°98-360 du 6 mai 1998 relatif à la surveillance de la qalité de l'air et de ses effets sur la santé et l'environnement, aux objectifs de qualité de l'air, aux seuils d'alerte et aux valeurs limites. Journal Officiel n°42 du 19 février 2002.

An Atmosphere Protection Plan (PPA - *Plan de Protection de l'Atmosphère)* has also to be established for each city of more than 250 000 inhabitants, as well as for specific areas where the air quality objectives or limit values may be exceeded. This plan has to be in accordance with the Regional Plan for Air Quality.

2.2.3. The Regional Plan for Air Quality in the "Provence - Alpes - Côte d'Azur" region

The Regional Plan for Air Quality of the administrative region "Provence - Alpes - Côte d'Azur" (PACA) [66] was elaborated by a Regional Commission for the Elaboration of PRQA (COREP - *"Commission REgionale d'Elaboration du Prqa"*) open to a large audience and placed under the presidency of the Prefect of the region. Before its approval by the Prefect, a first version of the draft plan was made available for public consultation and proposed for consultation during two months to the territorial authorities.

The PRQA defined 38 orientations to improve the current situation. They concern:

- The development of air quality monitoring.
- The information of the population, and the implementation of health monitoring in relation with air pollution.
- The evaluation of the air pollution impact on the environment and the buildings.
- The reduction of photochemical and ozone pollution.
- The reduction of industrial pollution.
- The reduction of the pollution associated with road traffic.
- The setting-up of groups representing the main stakeholders concerned by air pollution.

These orientations determine quantitative objectives for the reduction of pollutant releases. In order to ensure the good implementation of these orientations, the COREP was changed into an evaluation commission to monitor the evolution of the situation, without waiting the 5-years revising period recommended by the law on air quality and rational use of energy.

A Plan for the Protection of the Atmosphere (PPA) concerning the city of Marseilles as well as the Etang de Berre area is currently under development.

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[66] Regional Plan for the Quality of the Air (PRQA). DRIRE PACA.

http://www.paca.drire.gouv.fr/publications/environnement/rapports/prqa/Index.htm

3. THE PARTICIPANTS TO THE AIR QUALITY MANAGEMENT PROCESS

3.1. The stakeholders

3.1.1. State representatives

The DRIRE (Regional Department of Industry, Research and Environment) is in charge of implementing, under the authority of the Prefect, all or part of the policy decided by the Ministries of Industry, Environment, Transport, Labour, Research and Technology. As such it is notably in charge of preparing the chemical discharges authorizations for the local industries.

We have interviewed M. Ulasien, in charge of air pollution in the Division of industrial environment, risks and underground. M. Ulasien is notably the secretary of the working group on SO_2 of the SPPPI.

Various other State representatives are also members of the dialogue structures. For example : Departments in charge of health and social affairs (*DRASS -Direction Régionale des Affaires Sanitaires et Sociales*), equipment (*DRE - Direction Régionale de l'Equipement*) or environment (*DIREN - Direction Régionale de l'Environnement, ADEME - Agence pour l'environnement et la maîtrise de l'énergie*).

3.1.2. Industry representatives' (operators)

The Etang de Berre is characterized by a high concentration of industries. The main industries contributing to discharges of SO2 are refineries (Total, BP, ESSO, SPM), chemical and petrochemical industries (ATOFINA, Shell, Naphtachimie, Cabot,…) and the oil-fired power plant (EDF).

We have met the environmental quality manager of British Petroleum (BP) : Mrs Durand Pinchard

The representation of these industries within the dialogue structures is also made through national organisations such as:

- *Union Française de l'Industrie du Pétrole (UFIP)* - French Union of Oil Industries
- *Syndicat Général des Industries Chimiques (SGIC)* - General Syndicate of Chemical Industries

3.1.3. Local authorities

This term is used to designate local or regional elected people such as Mayors, Associations of Mayors, Regional or County Councils. We have interviewed M. Andreoni, Mayor of Berre, and President of AIRFOBEP.

3.1.4. Non Governmental Organisations

Several non governmental organisations (NGOs) usually in the field of environmental protection are participating to the dialogue structures. We have met the representatives of two of them :

The MNLE 13 (Mouvement National de Lutte pour l'Environnement - National Movement of fight for the environment) was created in 1981. Its members are scientists, politicians, Union representatives... County delegations have been created and in the county of "Bouches-du-Rhône", the MNLE 13 is composed of 150 to 200 members. Resources are provided by its members, the County Council and the Regional Council. In the Seventies, and even before, a major issue for most of the environmental NGOs was the protection and the clearing of the Etang de Berre. Most of them were grouped together into a larger NGO, which still exists (*Coordination for Rehabilitation and Development of the Etang de Berre*, *Collectif Etang Marin*). The MNLE 13 was interested by the quality of the water of the Etang de Berre, but it was also concerned by other topics such as the atmospheric pollution. Furthermore, it was not claiming for the closing of polluting industries but it was looking for solution allowing the development of industrial activities together with the protection of environment. It thus left the Coordination for Rehabilitation and Development of the Etang de Berre at the beginning of the Nineties.

We have met Mr Nevière, president of the Vitrolles's committee.

The ARDEB (Association Rognacaise pour la Défense de l'Etang de Berre - Rognac Association for the Protection of the Etang de Berre) was created in 1993 in the town of Rognac and is in relation with the various actors concerned by air pollution management: chemists, physicians, operators, public authorities representatives, air quality measurement experts.... Together with Shell, ARDEB created in 2001 the Local Commission for Information and Exchange (CLIE) of the Shell facility.

We have interviewed Mrs Molgosa, local elected representative of the city of Rognac, Honorary President of ARDEB and also a founder member and the secretary of the CLIE.

3.1.5. Control and measurement institutes

The association AIRFOBEB (network for the monitoring of air quality) was created in 1972 at the initiative of the operators in order to develop in the area of Fos and the Etang de Berre a network of pollution measurements stations and to promote and achieve any action that could reduce pollution or at least prevent from pollution increase. In 1986, the State services and the Local Authorities joined the association, as well as, in 1991 and 1996, NGOs for the protection of the environment.

It is now agreed by the ministry of environment as an "air quality control association" for the county of "Bouches-du-Rhône" (these type of structures have been created by the law on air quality and rational use of energy of December 1996).

The members of AIROFBEP are representatives from 4 colleges : State representatives (8 members), Local Authorities (10 members), Industry representatives' (10 members) and NGOs (7 members). The budget of AIRFOBEP comes from contributions from the Local Authorities (18%), State Services (24%) and the industry representatives' (57%). The current President of the association is the mayor of Berre.

The main missions of AIRFOBEP are:

- To develop a network of atmospheric pollution measurement stations (34 fixed stations are now under operation, plus a mobile laboratory of measurement).
- To analyse the measurements, notably in order to check the compliance with national and European standards.
- To provide members, media and population with a transparent information on air quality.
- To participate to actions and studies for the improvement of air quality
- To develop and improve the forecast of pollution, and implement, in coordination with the State services, preventive actions when necessary. These actions concern notably information or alert procedures for the population in case of pollution events and the implementation of SO_2 releases reduction actions (STERNES procedures).

3.1.6. Information structures

The CYPRES (Public Information Centre for the Prevention of Industrial Risks and the Protection of the Environment) was created in 1991 at the initiative of the SPPPI. Its purpose is to provide a free access to information on technological risks and the industrial environment in the region "Provence-Alpes-Côte d'Azur".

3.2. The dialogue structures

3.2.1. The SPPPI and the Working Group on SO2

As mentioned in the previous section, the Permanent Secretary for Industrial Pollution Problems (SPPPI - *"Secrétariat Permanent pour les Problèmes de Pollution Industrielle"*) of the region "Provence - Alpes - Côte d'Azur " was created in 1972. It is chaired by the Prefect of the region. As stated by the SPPPI in its 2003 report[67]: *"the main mission is to group around the table some actors having a priori opposite interests: industry representatives', local authorities and environmental protection NGOs"*. The areas of work concern water, air, wastes, polluted sites and soils as well as technological risks.

[67] Bilan SPPPI Provence - Alpes - Côte d'Azur, Juin 2003

Several working groups are created according to the issues at stake, animated by the DRIRE and composed of representatives from the State, the local authorities and local elected people, the industries and the NGOs.

The Working Group (WG) on Sulphur dioxide (SO_2) was created at the very beginning of the SPPPI as this pollutant was considered as the main contributor to the air pollution. The DRIRE is chairing the WG and prepares the meetings in coordination with the industry representatives' and AIRFOBEP (national network for air pollution surveillance). Its main mission is to improve the urgent actions to be undertaken in case of high SO_2 concentration in the air, and to elaborate action plans in order to meet the quality objectives and the limit values to be applied in 2005. The main participants to this WG are presented in Table 3. However, this list can evolve according to the issues at stake. It is the DRIRE who is in charge of sending the invitations. For example, local authorities from new cities have joined the group recently following their request to the DRIRE (around 50 persons attended the last meeting in April 2003).

Table 3. Participants to the Working Group SO_2

ADEME (E)	OXOCHIMIE (I)
AIRFOBEP (M)	Préfecture 13 (E)
CCI-MP-Environnement Industrie (I)	SETCM (I)
Commune D'Aubagne (C)	SGIC (I)
CYPRÈS (*)	SHELL Pétrochimie Méditerranée (I)
DRIRE – GS 13 (E)	SOLLAC Méditerranée (I)
EDF Ponteau (I)	Sous-Préfecture d'Istres (E)
ESSO (I)	TOTALFINAELF
Marseille Provence Métropole (C)	Raffinerie de Provence (I)
MÉTÉO France (M)	UDVN 13 (A)
MNLE 13 (A)	UFIP (I)
Multipôle de l'Étang de Berre (C)	URVN (A)
NAPHTACHIMIE (I)	VIE Collectif Air – Velaux (A)

(E) State representatives: 4 ; (C) Local elected people: 3 ; (I) Industry representatives': 11 ; (M) Control or measurement institutes, laboratories: 2 ; (A) NGOs : 4

3.2.2. The Regional Commission for the Elaboration of the Air Quality Regional Plan (COREP)

The COREP, composed of approximately 80 persons, was created in 1997. The DRIRE ensured the secretariat and animation. To gather competences of all the actors, the reflections were organized according to 4 working groups (air qualification, health priorities, environmental priorities, control of the emissions of fixed sources and mobile sources) to which the representatives of 5 colleges took part ("local authorities" college, "economic actors" college, "NGOs" college, "qualified personalities" (experts) college, "State Services" college).

3.2.3. Local Commissions of Information

Recently, several local commissions of information have been created in the County of "Bouches-du-Rhône" at the initiative of operators, local NGOs or Local Authorities. We have been informed about two of them

The Local Commission of Information and Exchange (CLIE) of Shell was created in August 2001 following a request by the local NGO ARDEB to the Shell facility. It was created by both Shell and ARDEB. The meeting organised by the CLIE are opened to 3 local NGOs (including MNLE 13 and ARDEB) and local elected representatives (Berre, Rognac...). Depending on the agenda, experts (AIRFOBEP...) or other industry representatives' (Total, BP...) are invited. The agenda and the minutes of the meeting are written by the NGO. Shell only corrects the technical aspects of those documents. The first meetings grouped only a few members, but now more than 40 participants (mayors, DRIRE, NGOs, other industry representatives', citizens, AIRFOBEP,…) attend the meeting. The issues discussed concern industrial risks, environmental pollution or nuisances.

In 2002, BP decided to create a dialogue forum with the local inhabitants to discuss with them some local issues. This structures, the "community committees" - comités de quartier - of BP look like the Shell CLIE. NGOs, local elected people, School director… are invited to the meetings (3 to 4 meetings per year), which are organised by the BP's Communication Direction, which prepares the agenda (according to the population demands), the minutes of the meeting… The discussed topics are presented by experts.

4. THE ACHIEVEMENTS OF THE AIR QUALITY MANAGEMENT PROCESS

4.1. The decisions associated with the Regional Plan for Air Quality

The PRQA was published before the 1999 European Directive and the consequent national regulations (for example the 2002 decree on SO_2 air concentration limits). The Committee created for its elaboration was however aware of the future limits for SO_2 and proposed, among the 38 orientations of the PRQA, some industrial pollution quality objectives for 2003 in order to anticipate the new SO_2 legislation, notably:

- The sulphur dioxide emissions must be reduced by 30% in 2003 (on the basis of 1994 figures). The third of this reduction must be carried out by the end of the year 2000 because of the application of prefectoral decrees relating to the oil refineries. Complementary measures will be decided, based on the technologies available to give off sulphur.
- The STERNES procedures (see 4.2.), aiming at preventing SO_2 pollution peaks, will have to be improved in order to better take into account the weather conditions and the effects of wind (the wind can concentrate the fume emitted by one or more factories on the same zone).
- The follow-up of these orientations must be ensured by the DRIRE through the SO_2 working group of the SPPPI "sulphur emissions", notably with the collaboration of other State Agencies and Industry Associations.

The PRQA also proposed some orientations with regard to the health impacts, among them:

- The improvement of the population information on the health effects associated with air pollution.

- The setting of a health surveillance system to define and improve health indicators such as children health reports, medicines consumption or hospital entrances.
- The continuation of epidemiological surveys.
- The use of the "Air and Health" Working Group of the SPPPI to follow-up the implementation of these recommendations.

Finally, one orientation of the PRQA is devoted to the composition of the working groups of the SPPPI, recommending that their composition should be modified to add new members in order to better guarantee the representation of all stakeholders.

As noted before, a specific Commission was created to evaluate the implementation of the PRQA's recommendations. It appears also that the various working groups of the SPPPI will be used as a relay of the DRIRE for establishing action plans to meet the objectives of the PRQA. 4.2. Achievements of the SO_2 Working Group

4.2.1. The STERNES procedures

A central subject of discussion in the dialogue taking place within the SO_2 working group concerns the prevention of pollution peaks. A specific procedure (unique in France) was elaborated by the WG in 1980, and improved since this date. This procedure is called STERNES (Temporary System of Regulatory and Normative Framing of the Sulphur Emissions) and aims at the temporary reduction of SO_2 releases according to weather conditions and SO_2 atmospheric concentration. Two procedures can be distinguished:

- A general procedure (during winter): when the forecast of meteorological conditions are such that they will favour an accumulation of SO_2 in the atmosphere, the 11 concerned industries must limit their releases of SO_2 to 242 tons per day (intermediate quota). If, despite this procedure, the alert threshold (600 $\mu g/m^3/h$) is reached, a supplementary reduction is asked to the operators (210 tons per day).
- A local procedure: it concerns small geographic areas which might be highly impacted by the pollution under specific meteorological conditions. If a particular wind direction is observed, the industries concerned must reduce their releases if the threshold concentration of 350 $\mu g/m^3$ (initially 450 $\mu g/m^3$) is exceeded. This threshold was reduced in 2003 at the initiative of some operators in order to better anticipate the potential pollution peaks.

When an industry has to reduce its releases, it can either burn a less sulphured fuel (more expensive than the usual one), or reduce its production.

AIRFOBEB is delegated by the DRIRE to inform the industries when the procedures have to be started (according to their measurement of air pollution concentration, and to the meteorological forecast received from METEO France). It also plays a key role in the development of studies needed to determine when the procedure should be started, and in the future analysis of the effectiveness of the procedures.

The releases reduction quotas are specific to each industry. They are discussed between the industry representatives' and the DRIRE, then implemented through a specific decree.

The SO_2 Working Group meetings are still mainly devoted to the STERNES procedures, as there is still a discussion on their effectiveness, and on the way to use them in order to meet the air quality objectives of 2005. On this topic, the discussion remains mainly between the industry representatives', the DRIRE and AIRFOBEP, even if other type of stakeholders are present.

4.2.2. Other type of issues discussed in the SO_2 Working Group

All the meetings of the SO_2 WG start with a detailed presentation by AIFORBEP of the results of their measurements of SO_2 air concentration, showing notably when the current limit values are exceeded and what would happen if the future values had to be applied. It also presents the number of STERNES procedures launched.

This presentation allows all participants and notably those who are not directly involved in the STERNES procedures implementation (namely the Local Authorities and the NGOs) to be aware of the situation, and possibly to discuss with AIRFOBEP on its measurement network.

During the last meeting in April 2003, a discussion took place on the information to be provided to the population when the information/recommendation or the alert thresholds are exceeded. The mayors of some cities complained on the fact that they do not know exactly what to do when they receive the information from AIRFOBEP that the thresholds are exceeded. Following this discussion, the DRIRE decided to create a specific working group on this topic.

This WG is also a place for the NGOs to relay some of their concerns, for example concerning the health impact associated with the exposure to the background level of pollution. We noticed however that they seem to have a small direct impact on the final decisions of the WG (which are taken by the DRIRE).

It is also in this WG that the DRIRE recently asked the industry representatives' to provide technical-economic studies on the possibilities to reduce their SO_2 releases (according to the PRQA orientations).

4.3. The Local Commission of Information and Exchange of Shell

The meetings organised by the CLIE of Shell are opened to several local NGOs and local elected representatives. Depending on the agenda, experts (AIRFOBEP...) or other industry representatives' (Total, BP...) are invited. About four meetings a year are organised. The main issues to be discussed during the meetings are planned in advance. They concern, for example, the atmospheric releases, the SEVESO procedures, the liquid releases, waste management, … The minutes of the meetings we have obtained show in fact that very detailed questions related to the operation of the petrochemical

site are asked by the NGOs or by the Local Authority representatives. A discussion on the last operating events on the Shell site (small incidents, peak of pollution,) is also planned as well as a visit of the site. As only a few persons can participate to the visit, a detailed report of the visit is integrated in the minutes of the meetings.

The topics addressed in these meetings are closer to the local population concerns than the discussions of the SO_2 WG for example. The final objective is not the same, as the WG is more devoted to the elaboration of action plans to comply with the regulation, while the purpose of the CLIE is to provide a place for dialogue and communication between the operator and the local population.
Some modifications of the operation of the site can however be decided as a result of a questioning of the population. For example, following a request of the population, relayed by the ARDEB, Shell decided to launch an engineering study in order to modify the tank that was responsible for hydrocarbons emissions and disgusting odours in the area of Berre and Rognac.

4.4. The stakeholders point of view

4.4.1. Interview of a local environmental NGO representative

Mr Nevière lives in Vitrolles, a city located close to the Etang de Berre. He is retired and President of the local committee of the MNLE 13, an environmental NGO.

In the field of air quality management around the Etang de Berre, the MNLE 13 participates to working groups of the SPPPI (SO_2 and O_3), the COREP (in charge of writing down the PRQA and its application) and the CODEP (in charge of writing down the PPA and its application). The MNLE 13 has participated to AIRFOBEP general assembly since the beginning of the Nineties thanks to the support of local elected people. Mr Nevière recognised that the perception of AIRFOBEP works improved in 1996 when a local mayor, Mr Andreoni, became the president of AIRFOBEP (before 1996, AIRFOBEP was presided by an operator). Mr Nevière estimates that NGOs and local representatives played an important role in the implementation of the STERNES procedures. As an example, he explains that a study was carried out by AIRFOBEP a few years ago thanks to the protesting of local NGOs strongly supported by local representatives and the MNLE 13 in a location that was particularly exposed to atmospheric pollution. It resulted in the installation of a permanent air quality measurement device in that location.

Nevertheless, Mr Nevière wonders if some experts from AIRFOBEP's administrative board or operators profit by the ignorance of NGO's representatives on specific technical aspects and he wishes NGOs had more resources in order to be able to finance survey or to hire technicians who could check the pertinence of the location of measurement devices, the choice of the pollutants to be sampled, the way measurements are carried out and interpreted. Furthermore, he thinks that some NGO's claiming do not find an echo among public authorities or operators he finds it tiring to repeat the same questions without getting any answer. A specific claim concerns the treatment of the background levels of pollution by a global reduction of emissions whereas the debate is always focused on the reduction of number and the duration of pollution peaks. He also

regrets the way the PRQA was written down as once more he thinks that his remarks were only partly taken into account.

Concerning health impacts associated with the atmospheric pollution, Mr Nevière explains he does not trust the results of the Panoxy-Berre study. This study concluded on the non-existence of any relationship between air pollution levels and public health, as there are no more sanitary impacts in the area of the Etang de Berre and the "reference city", Salon-de-Provence. To Mr Nevière, as Salon-de-Provence is as polluted as cities located around the Etang de Berre (contrary to the hypothesis of the Panoxy-Berre study), this conclusion cannot be received (as Salon-de-Provence was not as monitored as today, the real level of air pollution was not known in details). Furthermore, from the point of view of Mr Nevière, it is often reminded of inside air pollution to minimize outside air pollution impacts, but those two types of pollution should not be compared. People suffer from both pollutions and they often have to stay at home because of the noise and the outside pollution.

The emergence of new structures, the Local Commissions for Information and Exchange, managed by operators, is seen as a good way to get reliable information, to ask specific questions or to visit plants. He regrets that no specific budget is allocated to those structures contrary to what is done in the nuclear sector. For instance, the Local Commission for Information of Cadarache produces a newssheet which is distributed to the population (see the Gravelines case study).

Finally, Mr Nevière explained his fear to see the participation of NGOs to the debate held in the various dialogue structure interpreted as a way to validate decisions that come from operators or public authorities, which could result in a loss of confidence in NGOs.

To conclude, Mr Nevière wishes the MNLE 13 could:
- Get reliable information before any decision taking,
- Be able to rely on external experts,
- Be able to express his opinion, be heard and get answer to all its questions.

Mr Nevière also outlines the lack of financial resources of NGOs and their difficulty to participate to all the Working Groups of sub-committee that are created.

4.4.2. Interview of a local elected representative

Mr Andreoni is mayor of Berre and President of AIRFOBEP.

Up to 1996, AIRFOBEP had been chaired by an operator. In 1996, the industry representatives' asked Mr Andreoni to chair AIRFOBEP. They felt that it could bring more confidence in the works that was carried out by AIRFOBEP's experts and to Mr Andreoni mind, they were right. Mr Andreoni adds that today NGOs are largely represented during the general assembly (the vice-president of AIRFOBEP is a NGO representative).

AIRFOBEP is mainly responsible for the respect of regulations by operators. Mr Andreoni thinks that the information produced by AIRFOBEP's experts must be shared with the population, transparency in the presentation of the work being a major component of AIRFOBEP's credibility.

Mr Andreoni explains that there is no conflict between industry representatives', public authorities or NGOs who participate to AIRFOBEP general assembly. He believes that the strong risk culture among the population associated with the historical industrial vocation of the region could explain this. But even if industries bring jobs and professional taxes, it is not a reason to forget the protection of the environment. Thus he estimates that chairing AIRFOBEP is a good way "to keep the pressure on operators".

Concerning the drafting of the PRQA, Mr Andreoni believes that the predominant role of the DRIRE (public authorities) is normal since they have the technical competence to carry out this mission. He wishes the presence of public authorities in the SPPPI could be a way to influence decisions taken by the Ministries. For example, he regrets the decision of the State (with no consultation) to increase the capacity of the Marignane airport (that will lead to an increase of the atmospheric pollution) while constraints on industrial practices are more and more severe.
Finally, Mr Andreoni believes that the creation of a Local Commission for Information and Exchange by Shell is a step forward for a "collective" management of air quality and another way to "keep the pressure" on operators in order to maintain their atmospheric releases at a low level.

4.4.3. Interview of the director of AIRFOBEP

Denis Savannes, director of AIRFOBEP, explains that AIRFOBEP is a technical support for the SPPPI, in charge of presenting the results of measurements, regulating the STERNES procedures or proposing studies on specific topics. The studies performed by AIRFOBEP, notably those related to the elaboration of decision-making aiding tools, are used as a basis for discussion within the working groups. These studies are decided by the administrative board of AIRFOBEP. The results of all studies must be available to the public (according to the status of the association).

The purpose of AIRFOBEP is not to be a consultation structure, but it contributes indirectly to a dialogue between the 4 colleges represented in the association. The objective of AIRFOBEP is to provide an open, objective and transparent information (all measurements are broadcasted on their internet web site). The presence of these 4 colleges contributes to the credibility of the information provided by AIRFOBEP.

AIRFOBEP also participates sometimes to industrial Local Commissions for Information and Exchange, which favour a better understanding of the local concerns.

One of the main advantage of AIRFOBEP is the small size of the Etang de Berre area, which permits to perform proximity actions to the local population. M. Savannes notes also that because air quality issues are well known in the region, AIRFOBEP can provide a more technical information than other air quality control associations (which usually provide a "general public" information).

4.4.4. Interview of a Shell Local Commission for Information and Exchange founder member

Mrs Molgosa is a local elected representative of the city of Rognac, located close to the Shell oil refinery. Rather concerned by the problem of air pollution in the area of the Etang de Berre, because of her son's health, she became in 1998 a member, and soon after the president, of the Association for the Protection of the Etang de Berre (French acronym: ARDEB), a local environmental NGO. Though her activities in this NGO, she meets the various actors concerned by air pollution management: chemists, physicians, operators, public authorities representatives, doctors, air quality measurement experts...

She realized that operators had to provide information on their activities only once every five years and she felt disappointed about it: that was not enough to her mind. She decided to explain her feelings to the General Delegate of Shell Development (M. Deport) in 2001 and a meeting was organised between Shell and the ARDEB. This meeting resulted in the creation of the Local Commission for Information and Exchange (CLIE) in August 2001.

The CLIE appears to be a "constructive" way at the very local level to discuss between different stakeholders the main issues raised by air pollution. In fact, there is a direct contact between people living just near the plant and the operator (who can explain precisely what is done to improve its environmental performances). It helps to develop a climate of trust. Nevertheless, according to Mrs Molgosa, the presence of public authorities during the last meetings modified the quality of the exchange, as the Shell representatives seemed to feel " less open" to the dialogue.

Mrs Molgosa thinks that the creation of several CLIEs in the area of the Etang de Berre testifies for the efficiency and the usefulness of this local dialogue structures. The CLIE can be seen as an answer to a local demand, whereas the SPPPI is situated a regional level and its main objective is to solve global issues. The SPPPI is less "close to the field" and its proposals are made essentially to be used by the DRIRE.

Finally, Mrs Molgosa does not believe that the point of view of an independent expert is systematically needed. Several members of ARDEB are former engineers or managers from the oil industry. As a consequence ARDEB can benefit from their knowledge to understand the technical content of the topics discussed during the CLIE meetings. Mrs Molgosa estimates that non-experts have to do their best in order to be in position to understand the technical aspects of air pollution problems. Finally, depending on the topics dealt with during the meetings, the CLIE can inform the site manager, the DRIRE and the Prefet of how issues raised are, or are not, solved.

4.4.5. Interview of a British Petroleum environmental quality manager

Michèle Durand Pinchart, environmental quality manager, is representing BP at the SPPPI SO_2 working group.

Mrs Durand Pinchart believes that the interesting aspect of the working groups organised by the SPPPI is the possibility to exchange points of view on different topics between the public authorities (DRIRE) and the industry representatives'. It leads to a kind of competition between all operators represented (and mainly the 4 oil refineries) to get the best results as possible in terms of human health and environmental protection. As an example, she quoted the decision of BP to apply innovative "pre-STERNES" procedures (in theory the procedures were launched when the SO_2 concentration rise 450 µg/m^3 and BP decided to decrease this limit at 300 µg/m^3) and the consequent decision of the other oil refineries to do so. Mrs Durand Pinchard describes the on-going pressure of DRIRE and European Directives on the operators to decrease their discharges into the environment.

To Mrs Durand Pinchard, although the environmental NGOs who attend the meeting of the SPPPI are free to express their concerns, they only have a little influence on the main orientations decided between the operators and the public authorities. However, at the local level, she sees them as playing an important role of relay of the population questions, wishes and feelings.

If she clearly admits that industrial activities around the Etang de Berre lead to discharges into the environment and are polluting, she outlines "It is of great importance to us to improve our environmental performances. The population must accept us. Our plants must be well integrated into their environment. We understand people's expectations, we are citizens and we also live close the plants".

BP created one year ago a structure dedicated to dialogue with local actors (mainly city and local NGO representatives). It has some common points with the Shell CLIE. Meetings are organized three or four times a year and the debate is focused on population questions and needs. The objective of BP is to answer those questions and to indicate the existing sources of information. Meetings are organized by the BP Communication Department, which also writes down the minutes.

Mrs Durand Pinchard thinks that there is a need for having a coherent and global approach of pollution management: transportation and cities contribute to air pollution, and this contribution is far from being negligible. It is one of the key roles of the SPPPI: allowing in next years this global approach (for example by creating a working group dedicated to the sustainable development).

Concerning the role of the expertise, Mrs Durand Pinchard explains that most of the health impact studies are carried out by national agencies or recognised consultants. As a consequence, she does not see the need for another expertise supported by BP and which will provide the same results. Mrs Durand Pinchard thinks it is of great importance for its reputation that AIRFOBEP's chairmanship is confided to a local elected representative.

The justification of the industrial activities has never been raised (BP has been present since 1922 on this site), but it could be asked for new industries.

4.4.6. Interview of the Secretary of the SO_2 WG from the DRIRE

M. Ulasien is in charge of air pollution in the Division of industrial environment, risks and underground. M. Ulasien is notably the secretary of the working group on SO_2 of the SPPPI.

M. Ulasien explains that the SPPPI was first initiated to debate around risk issues. It was then extended to other subjects (like for example, odours, health,…). One major interest of the SPPPI's working groups, is that it permits a broaden discussion with the industry representatives', outside a regulatory context. The presence of NGOs is interesting as they rise some relevant issues.

When the new SO_2 limits were published (to be applied in 2005), the DRIRE had a meeting with the 11 concerned operators, and ask them to present to the working group what was their plan to reach the future values. M. Ulasien thinks that it would have been more difficult to obtain such plans if the WG did not exist, and if the negotiations had to be undertaken only between the DRIRE and each industry.

The orientations defined in the Regional Air Quality Plan have been elaborated by the State Services following the work of the COREP. This plan permitted to better structure the actions undertaken by the Public Authorities or by the SPPPI.

5. FIRST ELEMENTS OF ANALYSIS OF THE AIR QUALITY MANAGEMENT PROCESS

5.1. Main characteristics of the "dialogue structures"

An interesting feature of the risk governance on air quality around the Etang de Berre appears to be the recent co-existence of two kinds of structures:

- On one hand, a “regional” structure, the Permanent Secretary for Industrial Pollution Problems (SPPPI, created 30 years ago), lead by the public authorities (DRIRE), aiming mainly at the implementation and the control of the application of French and European regulations,
- On the other hand, local structures, lead by an operator and / or a local environmental NGO (for example the Shell Local Commission of Information and Exchange - CLIE), aiming at providing a place for a dialogue at the local level. These structures being much more recent (1 or 2 years).

The SPPPI and the CLIE both deal with the management of air quality (and other kind of pollutions or industrial risks) and various actors attend the meetings organized by those structures, but the issues raised during the debate and relationship between actors are rather different. They appear somehow to be complementary.

The SPPPI is not a mandatory structure. It was created 30 years ago to temper a crisis created by the Local Authorities and due to their concern about the potential pollution which would result from the development of the industrial area located around the Etang de Berre (this development resulting from a firm decision of the Government). This structure is then issued from a territorial demand and a political willingness. It is used as a tool by the Public Authorities to favour the implementation of the regulations, and to keep the pressure on the operators while keeping a certain degree of dialogue with them and with the other actors (local authorities or environmental NGOs). It is a forum of implication of local stakeholders, even if the main players during the meetings are the DRIRE, the industry representatives', and, in the case of the SO_2 working group, the "expert", AIRFOBEP. The durability of this structure is probably due to its constant adaptation to the social, political and regulatory context (creation of new working groups, integration of new members, regulation evolutions, monitoring of new pollutants...). The role of the SPPPI is not to solve issues associated with one particular industry. It is concerned with the overall problematic of the industrial pollution of the region.

The CLIE of Shell is issued from the willingness of the operator to answer the demand of a local NGO for more information on the operation of the petrochemical site. It is not a regulatory structure. It is a forum of dialogue between the operator and the local population. The Public Authorities, even if they participated to a few meetings, are somehow excluded from the discussion.

We have analysed only the Shell CLIE, but since 2 years, other commissions of this type have been created around the Etang de Berre, either at the initiative of local authorities or operators; either to respond to the demand of the French Ministry of Environment[68].

5.2. Guiding principles of the decision making process

5.2.1. Decision making process within the SPPPI

Even if there is an increasing number of participants to the SPPPI meetings, the SPPPI is still mainly a dialogue structure between operators and public authorities. Most of the interviewed actors admit however that the operators are not the only responsible of the pollution, and that there is a real need to implicate new actors within the SPPPI working groups.
In the SO_2 working group, the agenda and minutes of the meeting are redacted by the DRIRE. The meetings are prepared in advance by representatives of the DRIRE, the

[68] It can be noticed that, following the severe accident in a chemical industry in Toulouse, a project of law in France is planning the creation of "CLIC" - Local Commission of Information and Consultation (*"commission locale d'information et de concertation"*) for all industrial sites presenting a high degree of risk, in order to provide information to the public. In July 2002, The French ministry of environment has asked the Prefects to create "experimental working groups" which could evolve into CLIC as defined by the project of law.

operators and AIRFOBEP. The dialogue is partly based on the results of air quality measurements presented by AIRFOBEP. The DRIRE representative lead the dialogue. The current issue is to find a consensus on how to comply with the recommendations detailed in the Regional Plan for Air Quality (PRQA) within penalizing the industrial activities. This Plan formalizes the ambition of the Authorities for the medium term concerning air quality. It will be reviewed every 5 years.

The decisions taken during the WG meetings concern actions to be undertaken by the operators (for example to provide technical-economic studies for the development of pollution reduction solutions), by AIRFOBEP (in order to improve their measurement systems), or the DRIRE (for example the creation of a specific WG to discuss on the information to be provided to the population in case of pollution peaks, at the request of some local elected people and NGO representatives).

Such a dialogue cannot really answer the increasing need of population to get informed on what is going on. This is certainly one of the reasons at the origin of the creation of the local commissions of information, which are closer to the population.

5.2.2. Decision making process within the Shell CLIE

The purpose of this structure is to favour a dialogue between one operator and the population (or relays, ie elected represented and local NGOs) living near its plant and who is a priori the most exposed to its pollutant emissions. The issues to be discussed are determined in advance by the ARDEB Association together with the other local NGOs which joined the CLIE, and greed by the operator. They are related to the operating of the petrochemical site, to explanations of recent incidents and to pollution issues.

This structure appears to be a way for the operator to understand what are the feelings of the population, what they want to know, what they are suffering from… It is used to determine which efficient measure(s) can be adopted in order to comply with their priority needs (information delivery, modification of a building, decrease of the disturbance associated with the noise…).

For the NGO and the representatives of the population, it is a good way to obtain information directly from the operator. It can also be a mean of pressure to obtain the implementation of actions by the operator (for example the elimination of odours).

An interesting feature is that the question of justification of the industrial activities has never been asked, even by the NGOs interviewed whose aim is to associate human’s health and environmental protection together with economic development. This can be partly explained by the historical context and the weight of the industries located in this area in terms of jobs provider.

5.3. Stakeholder involvement process

Within the SPPPI working group, various types of actors are involved: regulators, operators, experts, local authorities, local NGOs. It can be noticed that the local population is not directly involved, but this can be explained by the fact that the purpose of this group is to decide actions at the regional level. The local authorities or the NGOs seem to have a little impact on the decisions taken.

Nevertheless, the presence of NGOs is perceived as necessary by the DRIRE or the AIRFOBEP Director, as, from their point of view, NGOs are sorts of stimulus providing pertinent questions which can help the process of improving air quality. From the point of view of one NGO representative, however, the question raised are not answered, and they have sometimes the feeling that their presence is used as a "caution" to the decision taken.

The composition of the working group is not fixed. It can evolve in time according to the issues. It is the DRIRE who sends the invitation. Recently they have invited representatives of new cities which where confronted to some complains from their population about the level of pollution. The PRQA also provided a recommendation to open the working groups of the SPPPI to a wider number of actors.

It can also be mentioned that the Commission for the elaboration of the PRQA (the COREP) is composed of the same actors than those who participate to the SPPPI working groups. Some economical actors other than industry representatives' have been added (like for example the Regional Chamber of Trade and Industry, the Regional Chamber of Farming, the National Society for Railway Transports, the Airport...) as the plan had to take into account all sources of pollutions and not only the industrial ones.

The composition of the CLIE of Shell has also evolved with time. At the beginning, only a few members where invited (Shell representatives, 2 NGOs and the representative of some cities). The composition of the CLIE for the last meetings, (around 40 participants) shows that more local inhabitants have been participated, as well as other operators. AIRFOBEP also participates when there are some discussions on air quality. In fact, the composition of the CLIE, proposed by ARDEB, is three monthly revised according to the topics.

5.4. The role of expertise

A central actor of expertise is AIRFOBEP who provides the results of the measurements of air quality. The fact that the Administrative Board of this association and its General Assembly are composed by representatives of four colleges (State Services, industry representatives', Local Authorities and NGOs) contributes to the credibility of its results. This credibility was reinforced when the Chairmanship of the association was given to a mayor instead of an operator.

Concerning the CLIE of Shell, the representative from the ARDEB association thinks that it is not necessary to ask systematically for an external expertise. They rely on the knowledge of the members of the association to evaluate the proposals of Shell.

The representative of MNLE13 notes that the NGOs are more and more involved in decision groups (SPPPI working groups, CLIE, COREP, AIRFOBEP…). He notes however that the knowledge of the NGOs members is not always sufficient to evaluate the relevance of operators' actions. An external expertise would be useful, but the NGO does not have the financial means to pay some studies, or experts. He wishes that the CLIE created around various industrial sites had a specific budget to be used for external expertise. He also wishes it was feasible within the CLIE to publish a newssheet devoted to the population’s information.

The representative from BP estimates that there is no need for external expertise, as the health impact studies are not performed by the operator himself, but by external institutes.

G. IMPLEMENTATION OF THE OSPAR CONVENTION FOR CHEMICAL AND RADIOACTIVE RELEASES

FIRST PART : GENERAL BACKGROUND AND ORGANISATION FOR CHEMICAL AND RADIOACTIVE DISCHARGES

1. HISTORICAL CONTEXT

The OSPAR Convention for the protection of the marine environment of the North-East Atlantic was signed at a ministerial level in Paris on 22 September 1992 and entered into force on 25 March 1998.

The Convention has been ratified by all the Contracting Parties : Belgium, Denmark, the Commission of the European Communities, Finland, France[69], Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland and by Luxembourg and Switzerland.

1.1. The overall context : environmental awareness at an international level

The OSPAR Convention can be considered as the latest stage in developments which began in the late 60's. After years of economic growth, the question of the impact of human activities on environment is raised.

At an international level, states progressively adopt international agreements to protect the sea. In 1972, the UN Stockholm Conference on Human Environment declares that *"the states shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea"* (principle 7 - cf. OSPAR Convention, art.2.1 quoted below). In 1982, the UN Convention of Montego Bay on the law of the sea lays down principles on global and regional cooperation for the protection and preservation of the marine environment (part. XII). The sea is now considered as a *"common heritage of mankind"*[70] that should be protected from human activities. In 1992, the Rio conference reinforces states' commitments to protect the sea[71] by introducing the concepts of "precautionary principle" and "polluter-pays principle".

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[69] France : law n°97-1274 of 29 December 1997 authorising the ratification of the Convention for the protection of the marine environment of the North-East Atlantic.

[70] Art.136, United Nations Convention on the Law of the Sea, 10 December 1982.

[71] Chapter 17 of the Agenda 21

1.2. The Oslo Convention (1972) and the Paris Convention (1974)

The wrecks of the oil tanker *Torrey Canyon* in 1967 and of the Dutch ship *Stella Maris* in 1971 oblige the European states to take into account the protection of the marine environment of the North-East Atlantic.

In 1972 is signed the Oslo Convention in order to control the dumping at sea of industrial wastes, sewage sludge and dredged material and the incineration at sea of liquid industrial wastes. It entered into force in 1974. The dumping of industrial wastes and sewage sludge and incineration at sea has now been phased out. The OSPAR decision 98/2 prohibits the dumping of radioactive wastes.

The principle 7 of the UN Conference of Stockholm (see above) is at the origin of the signature of the Paris Convention in 1974 which aims at preventing marine pollution by discharges of dangerous substances from land-based sources and also from offshore installations. It entered into force in 1978.

From the start, the two Commissions applying the Conventions worked together and set up a common secretariat based in London.

1.3. The North-Sea Conference

At a regional level, the North-Sea Conference (NSC) brings together the representatives of coastal countries which were not satisfied with the progress made in the framework of the Paris and Oslo Conventions[72]. The countries concerned commit themselves to prevent pollution in the maritime area of the North Sea. The first meeting took place in 1984 in Bremen. Three facts can be underlined :

- on the contrary to the sectorial approach of the Oslo and Paris Conventions, the NSC insists on the global, eco-systemic approach ;
- the protection of the North-Sea can not be effective without an international cooperation ;
- the NSC introduces for the first time the precautionary principle as a guideline.

The NSC is just a political forum without structural organisation and its objectives are very close to OSPAR goals. In fact, the Strategies adopted in Sintra in 1998 (see below) are strongly influenced by the Esjberg Declaration in 1995 which defined seven strategies[73]; five out of seven are now OSPAR objectives.

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[72] Members of the NSC are : UK, Norway, Sweden, Germany, Denmark, France, Belgium, the Netherlands, Switzerland and the European Commission (DG Environment).

[73] Protection of species and habitats ; fisheries ; prevention of pollution by hazardous substances ; further reduction of nutrient inputs ; prevention of the pollution from ships ; prevention of pollution from off-shore installations ; management of radioactive substances including waste.

Nevertheless, the signature of the OSPAR Convention in 1992 changed the position of the NSC : OSPAR works on the same topics but the geographic area is brighter. The NSC is only a subset of OSPAR maritime area.

1.4. The OSPAR Convention (1992)

The merge of the Oslo and Paris Conventions in 1992 contributes to preventing pollution at the best. The objective consists of updating the framework and consolidates the Conventions by unifying them in a single one called "OSPAR Convention". Unlike other Conventions signed under the aegis of the UN Environment Programme (UNEP)[74], OSPAR has got its own status and does not depend on the UN.

The geographic coverage of the new Convention is the same as the two Conventions but the definition given of a "maritime area" is brighter ; in fact, it includes *"the internal waters and the territorial seas of the Contracting Parties, the sea beyond and adjacent to the territorial sea under the jurisdiction of the coastal state to the extent recognised by international law, and the high seas, including the bed of all those waters and its sub-soil"*.

Whereas the Oslo and Paris Conventions listed some substances of possible concern, the OSPAR Convention has got an overall approach of the pollution. It deals with all the sources of pollution able to reach the maritime zone concerned[75]. The scope of initiatives is brighter. The four annexes to the Convention cover the achievements under the Oslo and Paris Conventions:

(i) prevention and elimination of pollution from land-based sources (like the radioactive discharges)
(ii) prevention and elimination of pollution by dumping or incineration (like the radioactive wastes)
(iii) prevention and elimination of pollution from offshore sources
(iv) assessment of the quality of the marine environment
(v) protection and conservation of the ecosystems and biological diversity of the maritime area

Its global objective consists of *"[taking] all possible steps to prevent and eliminate pollution and [taking] the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected"* (art.2.1).

In order to reach this aim, new provisions have been introduced :

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[74] For example, the Barcelona Convention for the Mediterranean Sea. The Helsinki Convention for the Baltic Sea has got the same status as OSPAR.

[75] Nevertheless, the Convention does not deal with the questions relating to management of fisheries (exclusive competence of the EU) and to maritime transport (Convention of London or "MARPOL Convention", 1973).

- the Contracting Parties will apply the precautionary principle and the polluter-pay principle ;
- they will define the best available techniques (BAT) and the best environmental practice (BEP) ;
- unlike the Oslo and Paris Conventions, binding decisions can be adopted by the OSPAR Commission ;
- the Convention provides for the participation of observers, including non-governmental organisations, in the work of the Commission ;
- it establishes for the public the right to information.

1.5. The Sintra ministerial meeting (1998)

To mark the entry into force of the new Convention, a ministerial meeting held in Sintra in July 1998 adopted long-term strategies focused on 5 subjects to guide the work of the OSPAR Commission :

(i) protection and conservation of ecosystems and biological diversity of the maritime area ;
(ii) hazardous substances ;
(iii) radioactive substances ;
(iv) eutrophication ;
(v) environment goals and management mechanisms for offshore activities.

This meeting adopted a new Annex 5 to the Convention which extends the competence of OSPAR ; it can now adopt programmes and measures to protect and conserve the ecosystems and the biological diversity of the maritime area.

We can notice that the Declaration of Sintra has got no legal value. On the contrary to some points of view, it is neither an Annex of the Convention[76] nor a binding decision. It is just a political declaration without binding force which lays down some objectives and the means to protect the marine environment. It is a compromise between the representatives of the 16 Contracting Parties.

1.6. The Bremen ministerial meeting (2003)

In June 2003 took place a ministerial meeting in Bremen to review the first five years' work towards the goals set at Sintra, to reaffirm the commitments of the Contracting Parties and to renew the mandates for further work on the five OSPAR strategies.

For the first time, the OSPAR and Helsinki Commissions worked together to improve the environmental protection of the North-East Atlantic and the Baltic Sea. Three topics have been developed : the need for an ecosystem approach to the management of human activities ; the support for the European Union initiative for a European Marine

[76] The Declaration of Sintra does not have to be ratified by the Contracting Parties.

Strategy[77] (which includes OSPAR Strategies) ; the creation of marine protected areas by 2010.

1.7. Summary of the chronology

Date	International agreement	Area
1967	*Shipwreck of Torrey Canyon*	---
1971	*Shipwreck of Stella Maris*	---
1972	UN – Stockholm Conference on Human Environment	Global
1972 *(1974)*	Oslo Convention	North-East Atlantic
1974 *(1978)*	Paris Convention	North-East Atlantic
1976 *(1978)*	UNEP - Barcelona Convention	Mediterranean Sea
1982	UN –Montego Bay Conference on the Law of the Sea	Global
1983	North Sea Conference (NSC)	North Sea
1992	UN – Rio Conference	Global
1992 *(1998)*	OSPAR Convention - 1st Ministerial Meeting	North-East Atlantic
1992 *(2000)*	Helsinki Convention	Baltic Sea
1998	OSPAR -2nd Ministerial Meeting Declaration of Sintra	North-East Atlantic
2002	UN –Johannesburg Summit on Sustainable Development	Global
2003	OSPAR – 3rd Ministerial Meeting Declaration of Bremen	North-East Atlantic (+ Baltic Sea)

2. PRESENTATION OF THE PARTICIPANTS TO THE RISK GOVERNANCE PROCESS

We can distinguish three main actors of the risk governance process at the level of OSPAR meetings. OSPAR is a relatively wide-open governance process.

2.1. Officers

OSPAR has got a very small structure ; no more than 10 persons (secretariat, jurists, linguists…) work permanently in OSPAR. The chief executive officer of the Commission is the Executive Secretary who is appointed by the Commission by consensus for 3 years. He manages the works of the Convention.

OSPAR is financed by the Contracting Parties. Thus the implementation of the Convention mainly relies on the resources of the Contracting Parties. The contribution to the OSPAR budget is divided between the Contracting Parties other than the European Union in proportion to their Gross National Product in accordance with the

[77] Communication from the Commission to the Council and the European Parliament, "Towards a strategy to protect and conserve the marine environment", October 2002 (COM (2002) 539 final).

scale of assessment adopted regularly by the United Nations' General Assembly. Germany is the first contributor, France the second and the United Kingdom the third[78].

2.2. Contracting Parties

The Contracting Parties are the 16 states which have signed the OSPAR Convention.

At a ministerial level, they are represented by the ministries responsible for the protection of the environment.

At the Commission level, the heads of delegation stand for different national authorities: the majority represents the Ministry of Environment and/or Environmental Agencies (Switzerland). The European Union is represented by the DG Environment of the Commission. The Chairman of the Commission is chosen between the heads of delegation. He is two-year-term-elected by consensus.

At the main committees, each Contracting Party may send to any meeting a delegation consisting of as many delegates as it considers appropriate ; heads of delegation are often assisted by technical experts or are technical experts themselves.

As an example, the Table 1 below lists the French heads of delegation in the different OSPAR meetings.

Table 1. French heads of delegations

	1992	**1998**	**2003**
Ministerial meeting	Ségolène Royal Minister of Environment	Dominique Voynet, Minister of Environment	Hélène Jacquot, Ministry of Environment/DGAFAI
OSPAR Commission	---	Geneviève Besse, Foreign Office/DE	Jean-Georges Mandon, Foreign Office/DE
Radioactive substances	---	Pascal Chatel, Ministry of Industry/DGEMP	Hélène Charpentier, Ministry of Industry/DGEMP
Hazardous substances	---	Dominique Gilbert Ministry of Environment/Direction de l'eau	Sylvain Bintein, Ministry of Environment/DPPR

DE = Direction des Affaires Economiques et Financières – Sous-direction de l'Environnement
DGAFAI = Direction Générale de l'Administration, des Finances et des Affaires Internationales
DGEMP = Direction Générale de l'Energie et des Matières Premières
DPPR = Direction de la Pollution et de la Prévention des Risques

On the contrary to the other Contracting Parties, the French head of delegation comes from the Foreign Office. It is a traditional position in the French diplomacy. Concerning the implementation of the Convention, it rests on the different ministries concerned : the ministry of Environment for the hazardous substances ; the ministry of Industry for the radioactive substances. In case of different points of view between the different French actors, the Foreign Office settles the disagreement after the intervention of the Prime

[78] Source : OSPARCOM, 2003, Bremen, summary record, annex 25.

Minister's services if necessary. Its position is a compromise between the different ministers.

2.3. Observers

Observers are members of non-governmental organisations, intergovernmental organisations and any states which are a non-Contracting Party. The Commission admits an observer by unanimous vote.

NGO's shall apply some criteria to be admitted as an observer. They must "*have an organised administration*" ; they are "*international in character*" and "*are authorised under their constitution to speak for their members through accredited representatives*". Observer status may only be granted to an NGO with specialised technical, scientific or other expertise pertinent to the objectives of the Convention. We can find both environmental and industrial organisations.

The OSPAR Commission can admit NGO's as "general observers" or "specialised observers". The first ones are entitled to participate in all aspects of the Commission's work - except internal management and finance - and the second ones only to meetings which concern them.

27 observers are admitted at OSPAR. Nine NGO's have got the status of general observers at OSPAR :
- 4 from industry : CEFIC[79], UNICE[80]… ;
- 5 from green NGO's : Greenpeace International, WWF, KIMO, Friends of the Earth…

18 are specialised observers like the World nuclear association (WNA), the Union of the Electricity Industry[81] or Eurochlor.

The allocation of the seats for NGO's in meetings of the Commission is decided by the President of the Commission and for the subsidiary bodies (main committees and working groups) by its chairman.

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[79] Conseil européen des fédérations de l'industrie chimique.

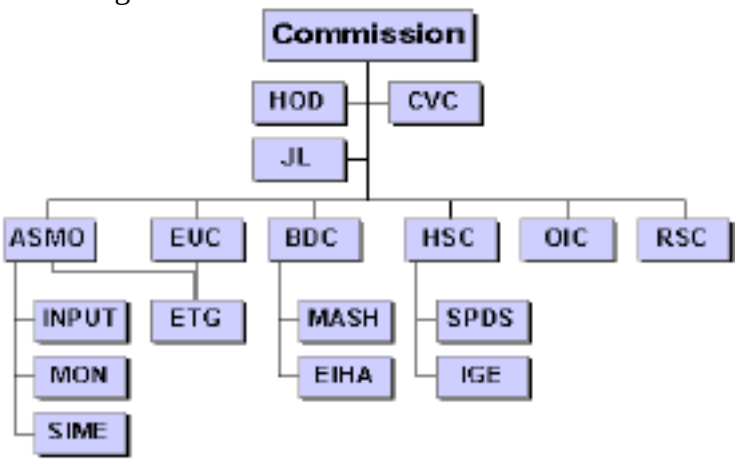
[80] Union of industrial and employers' confederations of Europe.

[81] COGEMA and BNFL are members of WNA. EDF is member of the Union of Electricity Industry.

3. PRESENTATION OF THE RISK GOVERNANCE PROCESS

3.1. OSPAR organisation

OSPAR is a three-tier organisation.



Management and advice

- Committee of Chairmen and Vice-Chairmen (CVC)
- Group of Jurists/ Linguists (JL)
- Heads of Delegation (HOD)

Second tier level

- Environmental Assessment and Monitoring Committee (ASMO)
- Eutrophication Committee (EUC)
- Biodiversity Committee (BDC)
- Hazardous Substances Committee (HSC)
- Offshore Industry Committee (OIC)
- Radioactive Substances Committee (RSC)

Third tier level

- Working Group on Inputs to the Marine Environment (INPUT)
- Working Group on Monitoring (MON)
- Working Group on Concentrations, Trends and Effects of Substances in the Marine Environment (SIME)
- Eutrophication Task Group (ETG)
- Working Group on Marine Protected Areas, Species and Habitats (MASH)
- Working Group on the Environmental Impact of Human Activities (EIHA)
- Working Group on Substances and Point and Diffuse Sources (SPDS)
- Informal Group of DYNAMEC experts (IGE)

At the first-tier level, the Commission (OSPARCOM) composed by the representatives of each of the Contracting Parties draws up programs and measures for the prevention of pollution, supervises the implementation of the Convention and reviews its effectiveness. It meets at the level of officials once every year. Regularly (every five years) takes place a ministerial committee (MMC) which aims at assessing and redefining the different Strategies.

At the second-tier level, six main committees have been set up by the OSPAR Commission. Five main committees have been created to facilitate the implementation of the five Strategies defined in Sintra. The Radioactive Substances Committee (RSC)

was established to facilitate the implementation of the Strategy with regard to radioactive substances, the Hazardous Substances Committee (HSC) for the Strategy with regard to hazardous substances. Their goals consist of assessing the effectiveness of the programs, preparing draft recommendations and decisions and assessing compliance of Contracting Parties with agreed measures and programs. They meet annually.

At the third-tier level we can find working groups. They've got a technical competence on one precise aspect of a problem. On the contrary to other main committees, the RSC does not rest on permanent working groups.

3.2. Aspects of the governance process

The OSPAR governance process can also be characterised as pyramidal : the Commission votes on the proposals for recommendations and decisions prepared by the committees on the basis of the technical work of the working groups.

Each Contracting Party has got one vote. The European Community is entitled to a number of votes equal to the number of their Member States which are Contracting Parties[82]. But it does not exercise its right to vote if the Member States exercise theirs.

Observers do not have the right to vote but can submit any documents they consider to be relevant. They can also make proposals but they need to be taken on by one Contracting Party to be discussed. The OSPAR organisation is basically intergovernmental : state is the key-element of the decision process. Unanimity is the basic principle of the decision process.

The risk governance process is based on the search of the compromise through the dialogue. It is a step-wise approach oriented towards the reduction of the marine pollution.

3.3. The status of OSPAR measures

The OSPAR Commission adopts programmes and measures and can take specifically recommendation or decision by a unanimous vote of the Contracting Parties. If unanimity can not be found, the Commission can nevertheless adopt them by a three-quarters majority vote. In this case, the decision only binds the Contracting Parties who voted it. Moreover, unlike decisions, recommendations have no binding force.

The subsidiarity principle is implicitly recognised : through their national rules, the Contracting Parties have to implement the objectives taken at an international level.

No inspections can be made to check the implementation of OSPAR measures.

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[82] Only Norway, Iceland and Switzerland are not Member States.

In case of disagreement, the OSPAR Commission can not pursue a country which does not apply the measures taken. Moreover, any disputes concerning the interpretation of the Convention between Contracting Parties is settled by a procedure of conciliation within the Commission ; in case of failure, a procedure of arbitration is engaged at the International Court of Justice.

3.4. Traceability and transparency

For each meeting, the Secretariat writes official minutes placed on the OSPAR website. Concerning the transparency of the process, we can distinguish two aspects :

- between the members of OSPAR : all documents are available. The stakeholders are present at the three levels of the risk governance process and can provide the other actors with reports and information.
- between OSPAR and the public : all documents are available to any person on request. The right of information for the public is guaranteed[83]. Nevertheless, the Contracting Parties are entitled to refuse the public spread of some documents where it affects, by instance, commercial and industrial confidentiality, public security…These documents are mentioned as “restricted”.

3.5. Interview of the OSPAR Secretariat about the general background and organisation

Mr. Alan Simcock is the OSPAR Executive Secretary. He formerly was the chairman of the OSPAR Commission (1997-2000) when he was the head of the British delegation.

OSPAR is not an organisation with a common will but rather a forum where governments try to reach agreement. Moreover OSPAR doesn’t have large capacities. It therefore much relies on the capacities of the Contracting Parties. It is a political process where trade-offs are made between contracting parties. The positions of governments are often themselves a compromise between ministers. Observers such as the industry and Greenpeace, can put pressure on Governments or pose questions to Governments which are known to take them over. In most cases the discourse is negotiated in front of NGOs. However in some situations, important negotiations take place at the level of Heads of Delegation where observers are not allowed to attend.

At OSPAR, there are two main ways of thinking. According to the first one OSPAR role consists in making trade-offs between risks and benefit. A risk might be acceptable if it is associated with savings that can be better used to develop protection against another risk. Against this view the second approach stands as a moral absolute obligation to avoid risk and keep the marine environment pristine. These two approaches showed up clearly during the Brent Spar controversy. Brent Spar arguments coloured the OSPAR negotiations on radioactive and hazardous substances strategies. As a result, risk assessment is more a management tool to progress than a drive, a goal-

[83] Art.9, OSPAR Convention, 1992.

setter in OSPAR activities. Although the interpretation of the strategies are diverse (especially for radioactive substances), the goals set in Sintra are closer to the absolutist view of the protection of the marine environment than to the economic view. There is a progressive move towards an ecology based approach, which takes on board wider considerations than human impact.

The increasing role of the EU on hazardous substances questions the relation between OSPAR and the EU. There are two schools of thoughts. One view is that the difference between EU and OSPAR should be diminished to avoid any duplication, and increase the level and the efficacy of resources in the protection of the environment. Another perspective is to consider that in a wide European Union with four different regions, there is scope for regional tools. While the EU would apply uniform approaches in member states, OSPAR is able to address the particular North East Atlantic environment. Otherwise, there are specific activities where OSPAR is not contested, for instance the protection of species.

SECOND PART :
DESCRIPTION OF THE RISK GOVERNANCE PROCESS CONCERNING THE RADIOACTIVE SUBSTANCES

1. THE POLITICAL CONTEXT : THE DECLARATION OF SINTRA (1998)

The OSPAR Strategy with regard to radioactive substances aims at *"preventing pollution of the maritime area from ionising radiation through progressive and substantial reductions of discharges, emissions and losses of radioactive substances, with the ultimate aim of concentrations in the environment near background values for naturally occurring radioactive substances and close to zero for artificial radioactive substances"*(art.1).

In achieving this objective, the following issues should be taken into account :
- legitimate uses of the sea ;
- technical feasibility ;
- radiological impacts on man and biota.

The implementation of the Strategy takes place in accordance with the following timeline.
- By the year 2000, *"the Commission will, for the whole maritime area, work towards achieving further substantial reductions or elimination of discharges, emissions and losses of radioactive substances"*.
- By the year 2020, *"the Commission will ensure that discharges, emissions and losses of radioactive substances are reduced to levels where the additional concentrations in the marine environment above historic levels, resulting from such discharges, emissions and losses, are close to zero"* (art.4).

The Declaration of Bremen in 2003 has modified the Strategy by leaving out the objective of 2000.

2. THE PARTICIPANTS TO THE RISK GOVERNANCE PROCESS CONCERNING THE RADIOACTIVE SUBSTANCES

2.1. The OSPAR Commission

In order to achieve the aim, the Commission will develop programmes and measures *"to identify, prioritise, monitor and control (i.e. to prevent and/or reduce and/or eliminate) the emissions, discharges and losses of radioactive substances caused by human activities which reach, or could reach, the marine environment and which could cause pollution through ionising radiation."* (art.3.1.)

It identifies radioactive substances which give rise to concern taking into account scientific investigations, in particular the MARINA-Project of the European Commission.

It develops programmes and measures that ensure the application of the best available techniques (BAT) and the best environmental practice (BEP) and assesses their implementation every five years.

It defines environmental quality criteria.

2.2. The Radioactive Substances Committee (RSC)

The Radioactive Substance Committee (RSC) formerly named Working Group on Radioactive Substances (RAD) was established to facilitate the implementation of the OSPAR Strategy with regard to radioactive substances.

RSC prepares draft recommendations, decisions or other programmes and measures aiming at a progressive and substantial reduction of discharges of radioactive substances. It arranges for the collection of data and information on anthropogenic discharges, emissions and losses of man-made and natural occurring radioactive substances. Moreover, it assesses reports from Contracting Parties on the effectiveness of programmes and measures implemented by them.

2.3. The participants to the RSC

The members of the RSC stand for national authorities or agencies that are responsible for the nuclear sector (environment / nuclear industry / radiation protection…)

France is represented by an officer of the “Direction Générale de l’Energie et des Matières Premières” (DGEMP - General Direction of Energy and Raw Materials) of the Ministry of Industry with the technical support of a member of the Institute for Radiation Protection and Nuclear Safety (IRSN). The French representative can rest on the scientific expertise of the IRSN and can ask the French Nuclear Safety Authority and the French operators their points of view about any concerns. IRSN helps the DGEMP to understand the technical stakes on radioactive substances but if there are different points of view, the final decision is taken by the representative of the DGEMP.

The IRSN member is at the present time the chairman of an intersessional working group about radiation doses (called IWG3) which depends on the RSC.

At the RSC meetings also participate :
- 16 Contracting Parties ;
- one intergovernmental organisation : IAEA ;
- four NGO’s : Greenpeace International, KIMO, WWF and, for the industry, the World Nuclear Association (WNA).

3. THE ISSUES AT STAKE

RSC is interested in all radioactive discharges from the nuclear and non-nuclear facilities (like the phosphate fertiliser industry). The majority of the monitored radioactive discharges comes from the reprocessing plants of La Hague and Sellafield ; thus, until now, the OSPAR Commission mainly focuses on them.

Measures taken by the OSPAR Commission can aim at reducing both liquid and gaseous discharges but in fact, they mainly focus on reducing liquid discharges[84].

The case of NORM[85] discharges is hardly questioned until now at OSPAR.

3.1. How to interpret the objectives of the Sintra Declaration ?

3.1.1. Timeline 2020 : what do “historic levels” and “close to zero” mean ?

By the year 2020, *“the Commission will ensure that discharges, emissions and losses of radioactive substances are reduced to levels where the additional concentrations in the marine environment above **historic levels**, resulting from such discharges, emissions and losses, are **close to zero**”* (art.4).

The participants to OSPAR do not agree with the meaning of the objectives of the Strategy with regard to radioactive substances, particularly the interpretation of “historic levels” and “close to zero”. At the present time, no consensus has been found between the different partners.

The “historic levels” refer to concentrations of radioactive substances in the marine environment due to past discharges. Two questions are principally raised : the definition of the level (problem of the natural variability of the concentrations) and the reference date. Some partners consider that the historic levels are related to 1998. Others think that they are not sensitive to a specific year. The stakeholders nevertheless agree that despite the absence of a consensus on its definition, the Strategy should not be postponed.

The formulation “close to zero” is differently interpreted by the participants : does it apply to discharges, concentrations or dose ? By instance, the WNA considers that the radiation dose is the most important parameter in assessing the reduction of radioactive releases. It concludes that radioactive releases are close to zero because the dose impact is very low. Greenpeace International has got a different point of view. It insists on the fact that the impact of radioactive substances on the marine environment is full of uncertainties and requires the development of environmental quality criteria. The

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[84] The annual report of the OSPARCOM only contains data on liquid radioactive discharges.

[85] Naturally Occurring Radioactive Materials.

precautionary principle has to be applied. Moreover, it makes a parallel with the Strategy with regard to hazardous substances and its ambiguous objective of "the target of the cessation of discharges". It asks for a harmonisation of the two Strategies[86].

3.1.2. How to set up "baselines" for releases, concentrations and doses?

In order to assess the progress on the implementation of the Strategy between 2000 and 2020, baselines have been introduced. These baselines consist of data on radioactive discharges, their concentrations in the marine environment and the resultant radiation dose to public.

At the RSC, three intersessional working groups have been set up : IWG 1 (discharges), IWG 2 (concentrations) and IWG 3 (dose).

Partners did not find yet a common position.

(1) IWG1: discharges

Five main concerns have been raised in the RSC 2003[87]:

- **base-period** : 1993-1997 or 1996-2000 ? Four Contracting Parties (Belgium, France, Spain and the United Kingdom) considered that the base period should be the first one because the baseline should reflect the situation before the Sintra commitments ; eight other Contracting Parties supported the period 1996-2000 since being centred on 1998, it reflected the starting point for the application of the OSPAR Strategy ;

- **statistical techniques** : the baseline should contain two components : the average of the range of these years (arithmetic mean) and the standard deviation of this range at the 95% level to cover for variability ;

- **choice of radionuclides** : the baseline covers total alpha, total beta, tritium, caesium 137, technetium 99 and plutonium 239/240 and other individual radionuclides that may have a substantial radiological impact on the marine environment. The choice is made by consensus between the Contracting Parties ;

- **normalisation** : France made the proposal to normalise the discharges against some other factors like the production of electricity. It argued that baselines (in absolute value) for plants that had been operating below full capacity during the base period would prevent them from moving again to full operation. The majority of the Contracting Parties is opposed to the French position ;

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86 Source : RSC 2001 summary record, agenda item 3.

87 Source : RSC 2003 summary record, Annex 4 " Progress report on establishing baselines for the OSPAR Strategy with regard to radioactive substances".

- **application** : the baseline is calculated for OSPAR maritime area and covers the discharges from nuclear and non-nuclear sectors. Some Contracting Parties would like to set more precise baselines in order to delineate the progress that have been made by individual Contracting Parties, a type of installation or one installation. France also argued for limiting the data used to those relating to the normal operation of nuclear installations ; discharges related to special operations should not be taken into account. Ireland is opposed to such a position.

(2) IWG 2: concentrations

This working group is collecting data on concentrations in the marine environment. OSPAR has been divided into 15 zones. The partners face a lot of concerns, particularly the definition of the base-period and the representativeness of the data (the different sizes of the data sets available for different zones). The same radionuclides as above are covered.

(3) IWG 3: doses

The work of this group is just at the beginning. The dose baseline element should in the first place be derived from the baselines on concentrations of radionuclides in the sea, and consequently a baseline element should be developed for the contributions to doses to members of the public from the same radionuclides in the zones used for the concentration baseline element.

The French proposal to take into account the collective dose has been refused although it has been calculated in MARINA II Project recently provided to OSPAR by the European Commission.

3.1.3. The Bremen ministerial meeting (2003)

At the Bremen ministerial meeting, a compromise for the base-period has been found. Until now, the question had not been settled at the RSC. Thus the OSPAR Commission asked the ministers to decide on the reference period. The period 1995-2001 has finally been chosen.

Moreover, the RSC should now find a consensus concerning three topics :
- an appropriate method for applying the baseline to the radionuclides iodine-129, carbon-14 and tritium ;
- an appropriate method of dealing with exceptional discharges arising either from the decommissioning of nuclear installations or from operations to recover old waste ;
- the variability in the level of operation of installations.

The agenda setting of these three topics is a result of trade-off between France and its other partners.

The Contracting Parties are also concerned about the problem of discharges of technetium 99 from the reprocessing plant of Sellafield. They welcomed the UK Government's recent request to the operator of Sellafield for a voluntary moratorium of technetium-99 discharges during nine months, during which the operator should explore the technical possibilities of the removal of technetium-99 from liquid wastes.

3.2. The assessment of the implementation of the Strategy

3.2.1. The national plan for achieving the objective of the Strategy

In order to assess the implementation of the OSPAR Strategy at a national level, national plans have been required by the Commission. National plan includes :

(i) modification of discharges authorisations ;
(ii) technical improvements to reduce discharges ;
(iii) forecasts for the year 2020 of discharges of radioactive substances.

All the national plans have been presented at the OSPAR Commission. It does not have to agree or disagree with them. It just takes note of it. The national plans present a wide variety of ways and means to implement the Strategy. The mid-term objective is to try to harmonise them.

The national plans have no legal value, they only represent the commitments of the Contracting Parties of applying the OSPAR Convention at a national level.

In particular, France considers that the reprocessing plant of La Hague fulfils the commitments of OSPAR. The review of the radioactive discharges authorisation for La Hague in 2003[88] is considered as the first translation into domestic law of OSPAR Convention. The article 42 implicitly recognises the OSPAR objectives of "close to zero" for artificial radioactive substances[89]. It emphasises on the transparency of the authorisation procedure guaranteeing the justification and limitation of discharges and their effect on the environment. Moreover, the chosen method – assessment study within a period of three years, review of the authorisation within 4 years – is inspired by the progressive and continuous approach of OSPAR. At last, the Arrêté of 26 November 1999 for the nuclear industries[90] requires environmental monitoring of the radioactive effluent before and after discharges and an assessment of the dose to humans.

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88 Arrêté of 10 January 2003.

89 Art.42 : "*With the ultimate aim to reach concentrations in the marine environment near background values for naturally occurring radioactive substances and close to zero for artificial radioactive substances (…)*".Cf. art.1 of the Declaration of Sintra.

90 Arrêté of 26 November 1999 setting technical requirements for the limits of discharges and emissions subject to regulation.

3.2.2. The assessment of the implementation of BAT

The Contracting Parties recognised the need to use the "best available techniques" (BAT) in order to reduce the releases of radioactive substances from their industries in the marine environment. The PARCOM recommendation 91/4 requests *"to apply the best available technology to minimize and, as appropriate, eliminate any pollution caused by radioactive discharges from all nuclear industries, including research reactors and reprocessing plants, into the marine environment."* National reports concerning the implementation of the recommendation 91/4 are assessed every 4 years. These reports are compiled to collect information of the application of BAT in nuclear facilities. In 2000, the French report has been presented. It particularly emphasises the fact that the French legislation already covers the tightening of discharge limits on the basis of "best available techniques" (Environment Code, art. L.110-1).

BAT and BEP are defined in the appendix 1 of the OSPAR Convention. In 1999, an agreement between the Contracting Parties tries to list criteria to which the parties have to refer for applying BAT. But the implementation of this principle is still questioned.

3.2.3. Towards an assessment of the environmental impact : the environmental quality criteria

OSPAR adopts the Joint Assessment and Monitoring Programme (JAMP) to assess the environmental impact of radioactive discharges. Each year, the Contracting Parties send the OSPAR Commission data about the liquid discharges from nuclear plants. An expert assessment panel reviews the reports provided. We can also notice that under Article 35 of the EURATOM Treaty, the European Commission verifies the monitoring arrangements for radioactivity in the environment of those Contracting Parties which are members of the EU.

Moreover, the goal of the RSC in a mid-term perspective (2007) consists of the definition of environmental quality criteria. Such work should build upon the international research of the International Atomic Energy Agency (IAEA)[91], ICPR or on the European program FASSET[92]. This program aims at bringing a framework for the assessment of environmental impact of ionising radiation.

OSPAR recognises that there are uncertainties about the effects of radioactive discharges on the marine environment. But it does not mean that nothing has to be done: adequate tools have to be created to allow the assessment of environmental impact of radioactive substances. Greenpeace International stresses on the expected long-term effects of persistence or bioaccumulation of radionuclides in the environment.

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[91] IAEA-TECDOC-1091,"Protection of the environment from the effects of the ionizing radiation", July 1999.

[92] FASSET : Framework for assessment of environment impact. It started in November 2000 and is to end by October 2003.

The European program will only define scientific criteria. Until now, other considerations in the definition of the environmental quality criteria like ethical or socio-economic considerations have not been taken account.

3.3. The particular case of the reprocessing plants of La Hague and Sellafield

The OSPAR Commission mainly focuses until now on radioactive discharges from nuclear reprocessing plants because the majority of the monitored radioactive discharges comes from La Hague and Sellafield.

3.3.1. The reprocessing and non-reprocessing options

OSPAR questions the reprocessing option of the spent nuclear fuel. The recommendation PARCOM 94/9 concerning the management of spent nuclear fuel requests the Nuclear Energy Agency of the Organisation of Economic Cooperation and Development (NEA/OECD) to *"carry out a thorough technical review and an assessment of the reprocessing and non-reprocessing options (…) "*. This technical review aimed at comparing the radiological impacts of the two options and their effect on the reduction or elimination of discharges of radioactive substances.

The NEA study report[93] concludes that the differences between the two concerning the radiological impacts are very low. The study does not give a clear indication on the choice of one option or the other. With regard to the marine environment, reprocessing of spent fuel results in discharges of radioactive substances into the OSPAR Convention area. Reprocessing creates larger radioactive discharges to the marine environment than non-reprocessing.

Several Contracting Parties draws the following conclusions :
- since the radiological impact on man is not the determining factor for making a choice between the two nuclear fuel cycle options, other factors become more important for such a choice ;
- there is scope for further reductions in discharges of reprocessing facilities which is also mentioned in the NEA study.

The Commission recognises that the NEA study outlined the need for the further development of environmental quality criteria[94].

In 2000 and 2001, two OSPAR decisions were voted :

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[93] NEA Study Report, "Radiological Impacts of Spent Fuel Management Options: A Comparative Study", 2000.

[94] Source : OSPARCOM 2000, Copenhagen, summary record, annex 11.

- OSPAR Decision 2000/1 on substantial reductions and elimination of discharges, emissions and losses of radioactive discharges with special emphasis on nuclear reprocessing ;
- OSPAR Decision 2001/1 on the review of authorisations for discharges or releases of radioactive substances from nuclear reprocessing activities.

The two decisions were adopted to review as a matter of priority the authorisations for discharges or releases of radioactive substances from nuclear reprocessing facilities *"(…) with a view to implementing the non-reprocessing option (for example dry storage) for spent nuclear fuel management at appropriate facilities (…)"*. We can notice that the expression "with a review to" does not mean "with the objective to".

3.3.2. The position of the different actors

The topic of the reprocessing/non-reprocessing option is a key-point of the discussion. France (and the United Kingdom) abstained to vote the two decisions. That's why they do not apply in the two countries; they have no real effects.

France refuses to vote the two decisions and points out that according to the NEA report, the reprocessing option does not trigger higher radiological impacts than the non-reprocessing one. Moreover, OSPAR has not to interfere in the French energy policy which is a national competence under the EURATOM Treaty. At last, no environmental impacts of radioactive substances have been proved. France concludes that *"the radioactive substances were not a priority"*[95].

On the opposite, Denmark, Ireland, Iceland and Norway consider that the objectives of Sintra can not be reached without closing down the reprocessing plants. Greenpeace International stresses on the uncertainties about leukaemia in the region of La Hague and on the environmental impacts. It considers that the actions of the nuclear reprocessing operators are seeking to redefine the terms of the OSPAR Strategy. The UK and France should agree to abide by OSPAR Decision 2000/1 and immediately end all nuclear reprocessing discharges ; it appeals in 2001 for a moratorium. KIMO insists more on the economic aspects by supporting the local coastal communities which need a clear environment to live with (cf. the problem of technetium 99 in 2003).

The other Contracting Parties have voted the two texts while some countries have contracts with BNFL or COGEMA for reprocessing their spent fuel.

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[95] OSPARCOM 2001, Valencia, summary record.

List of the measures adopted by OSPARCOM concerning the discharges of radioactive substances (it does not concern the radioactive wastes)

Measures	Subjects
PARCOM Recommendation 88/4 on nuclear reprocessing plants	- new reprocessing plant - increase of capacity of the existing plants
PARCOM Recommendation 91/4 on radioactive discharges	- appliance of the BAT - statement on progress every 4 years
PARCOM Recommendation 93/5 concerning increases in radioactive discharges from the nuclear reprocessing plants[96]	- new or revised authorisation if special consideration is given to BAT and an environmental impact assessment
PARCOM Recommendation 94/8 concerning environmental impact resulting from discharges of radioactive substances	- monitoring programmes - preparation of a summary environmental impact assessment - emphasis on assessing biological and ecological effects
PARCOM Recommendation 94/9 concerning the management of spent nuclear fuel	- assessing the alternative options for spent nuclear fuel management - NEA study report
Agreement 1999-11 : guidelines for the submission of information about, and the assessment of, the application of BAT in nuclear facilities	- guidelines for the application of BAT, implementation of the PARCOM recommendation 91/4
OSPAR Decision 2000/1 on substantial reductions and elimination of discharges, emissions and losses of radioactive discharges with special emphasis on nuclear reprocessing	- authorisations from nuclear reprocessing facilities reviewed as a matter of priority - with a view to implementing the non-reprocessing option
OSPAR Decision 2001/1 on the review of authorisations for discharges or releases of radioactive substances from nuclear reprocessing activities[97]	- review of authorisations as a matter of urgency

4. THE STAKEHOLDERS' POINT OF VIEW

4.1. Interview of the OSPAR Secretariat

Mr. Alan Simcock is currently the OSPAR Executive Secretary. He formerly was the chairman of the OSPAR Commission (1997-2000) when he was the head of the British delegation.

In the radioactive issue, there are three main sources :
- reprocessing : Sellafield and La Hague represent 80% of the radioactive input of OSPAR zone
- nuclear generating plants
- non nuclear industry

[96] Reservations from France and the United Kingdom.

[97] The two last decisions do not apply in France and the United Kingdom.

Because Sellafield and La Hague reprocessing plants are the major sources of radioactive releases there is a clear division between countries. France and the UK are convinced that what is done to control radioactive discharges is reasonable. Denmark, Ireland, Iceland, Norway are convinced that reprocessing is a threat to their economic interest. Others all have contracts with Sellafield or La Hague.

Ireland, Denmark, Iceland, Norway do no rely much on nuclear power. Moreover they are concerned about a risk of public reaction and effects on the market, as they would be with BSE. This is not specifically related to radioactivity. With regard to fish, dioxin is also significant. In the Baltic pregnant women shouldn't eat fish more than once a week because of the possible harm on babies. There is a large nexus of arguments floating around which make a risk assessment oriented policy difficult.

To get a formal OSPAR agreement you have to reach a _ agreement. OSPAR can't have an agreement on reprocessing because there are always more than _ opponents. Nevertheless this is a public arena and every one is trying to avoid being seen as the country being the problem. In 2000, Ireland brought a proposal to terminate nuclear reprocessing. Denmark also had a similar but different proposal. Nobody wished to be seen totally opposed to Ireland and Danish proposals. This is the reason for the negotiation of the decision 2000/1 in Copenhagen. Moreover, an agreement about the implementation of the Sintra Strategy was reached in Copenhagen in 2000 : each country will produce a report saying its interpretation. The aim is to try to get agreement to achieve the strategy. This is to make sure that countries implement their interpretation. By 2020 there will be an improvement at any rate.

To conclude, the OSPAR Executive Secretary makes a parallel between radioactive discharges and radioactive dumping. Before 1997, discussing this issue was impossible and then consensus was progressively reached. UK and France understand that they have to explain northern countries that what they do is relevant, reasonable. In UK a series of events with Sellafield undermined BNFL reputation and position. More ministers in the European Union are less convinced by nuclear energy.

4.2. Interview of the French representative at the RSC

Mrs. Hélène Charpentier is a member of the DGEMP, Ministry of Industry. She has been representing France at the RSC since 2001. During the interview, she was assisted with Mr. Michel Chartier from IRSN. He has also been participating to the RSC since 2001 as expert. He is the chairman of the working group about dose.

Mrs. Charpentier emphasizes the Strategy with regard to radioactive substances is relatively theoretical, presents a convoluted writing and thus is difficult to implement. It remains a political declaration without binding force. France expressed notably some reservations about the transposition of the Strategy in European law.

The involvement of DGEMP in OSPAR can be explained by the important industrial stakes associated with the implementation of the Convention. As far as the radioactive substances regulation is concerned, the DGEMP rests on the work made by the Nuclear

Safety Authority (DGSNR). The French national plan was for example written in cooperation with the DGSNR and the operators (COGEMA, EDF).

The French national plan insists on the fact that the review of the radioactive discharges authorisation for La Hague fulfils the commitments taken at OSPAR. Unlike the British national plan that defines specific orientations and announces objectives for 2020, it draws the picture of the current French legislation. France considers that the method of the regular review of the releases limits will allow to reach the Sintra objectives. France can not now announce results ; forecasts for 2020 have not been made. Moreover, the reference to OSPAR at the article 42 was included lately in the drafting.

Some EDF nuclear facilities should face an increase of tritium discharges. EDF has to report this fact to OSPAR as well as to the European Commission (within the framework of Article 37 of the EURATOM Treaty). In this context, the international aspects, and particularly OSPAR, may have a greater importance for EDF.

Concerning the two decisions refused by France, Mrs Charpentier notes the ambiguous positions of some Contracting Parties. Germany has for example expressed its opposition to reprocessing but still sends its radioactive wastes to La Hague. In fact, these decisions do not concern the commercial links, but only the revision of the releases authorizations.

The recommendation PARCOM 91/4 on radioactive discharges is based on the appliance of BAT to reduce pollution. The assessment of BAT seems currently to be realized ex-post : if the discharges decrease, BAT is applied. The concept of BAT seems to be not clearly defined. That’s why it is difficult to make viable comparison between the Contracting Parties and to know which one applies BAT. The recommendation 91/4 allows to provide regular data on radioactive discharges and raises the problem of the harmonisation of these data. France has presented its report about the implementation of BAT in 2001. COGEMA underlines that significant progress have been obtained for the liquid releases, notably by implementing a “new liquid effluent management”. The OSPAR Commission just takes note of it.

At the Bremen ministerial meeting, the base-period was adopted as a compromise; the 1995-2001 period being proposed by the German Environment Ministry Jürgen Trittin. France accepted the 1995-2001 base-period and as the same time France asked to put on agenda several issues :

- baseline period : France is worried about a possible ratchet-effect : periodically, the baseline could be modified in order to achieve the goal of “close to zero” before 2020 ; France is opposed to such situation ;
- normalisation : France refuses the baselines impede the development of its industrial activity, particularly its energy production capacity. Radioactive discharges should take the energy production into account. The majority of the Contracting Parties disapproves such position ;
- the baseline should cover all the radioactive discharges.

There is no organised and systematic consultation between France and the other Contracting Parties. Usually, no common position is taken before the meetings, each country keeps its own autonomy.

Usually, NGO's attending the meetings can speak when they wish to do so, but the impact varies according to the meeting Chairman willingness. This does not mean that NGOs do not have any important role: they have an initiative power which can have a non negligible influence if it is relayed by a State. It is the case with Greenpeace who entr often into alliance with Ireland or Norway.

4.3. Interview of the deputy-director of the DGSNR

Mr. Philippe Saint-Raymond is the deputy-director of the Nuclear Safety Authority (DGSNR).

One of the objective of the DGSNR consists of regulating the discharges of the nuclear facilities making sure that the discharges are as low as reasonable achievable (ALARA) given the available technology. At the beginning, the OSPAR Convention had got the same objective but the Sintra Declaration introduced a complicatewording of the objective not easy to implement according to the difficulties associated with its interpretation. The OSPAR Convention is perceived as essentially a political declaration ; thus the DGSNR does not consider it as a guideline for the elaboration of regulation.

The review of discharges authorisation for La Hague (Arrêté of 10 January 2003) includes elements related to the OSPAR Convention. The review every four years of the authorisation of discharges has been introduced after a request of the ministry of Environment which wished a reference to OSPAR. Without this political will, the DGSNR would not have necessarily included such a short-time delay for reviewing authorisations although it thinks that it is necessary to periodically review the authorisations to adapt the "reasonably achievable" to the evolution of technical conditions.
Greenpeace refers the new authorisation of radioactive discharges for COGEMA-La Hague to the “Conseil d’Etat”; it emphasizes this authorisation does not comply with the OSPAR Convention because, from its point of view, the radioactive discharges do not tend towards zero. The DGSNR should prove the new authorisation does not contradict the OSPAR Convention. The DGSNR particularly considers that the OSPAR Convention does neither require zero discharges (Greenpeace’s position), nor zero impact (COGEMA’s position) but “concentrations close to zero”.

The review of authorisations for EDF nuclear facilities does not take care of OSPAR objectives because their discharges into the sea are very low and rank below COGEMA-La Hague ones.

The French national plan was written by the DGEMP in cooperation with the DGSNR and COGEMA. The French State is bounded by this plan is plan, and as a matter of consequence, the DGSNR. As for normalisation, the DGSNR considers that it does not

correspond to the OSPAR Convention philosophy which is to decrease discharges in absolute value.

The DGSNR thinks that the European Commission at OSPAR can not commit itself for its Member States. The role of EURATOM is to establishe the basic radiation protection standards (ALARA principle…) but only States are competent to set discharges limits for their own facilities.

4.4. Interview of a COGEMA representative

Mr. Jean-Claude Bordier is the Director of Quality, Safety, Security and Environment in COGEMA-Reprocessing business unit . COGEMA is a member of the World Nuclear Association (WNA) present at OSPAR as an observer.

Mr Bordier stresses the importance of the formation of the different delegations attending the ministry meetings of the OSPAR Convention. There is usually a strong political position during these meetings, and according to the representatives, the influence might be from the industry or from the environment.

At the Bremen ministerial meeting in 2003, the OSPAR and HELCOM Conventions decide to work together with special emphasis on ecosystem approach (fishing, marine transports, legitimate use of resources,....). The case of the radioactive substances represented only 5% of the final Bremen declaration, even if this topic was often put at the front of the media debate.

Two groups at the OSPAR Commission can be distinguished: the countries with nuclear energy production facilities and the countries without nuclear facilities. Among the group considered as "against nuclear", are : Ireland, Norway, Iceland, Denmark. Among the countries having nuclear facilities, some are using the waste reprocessing, not only France and the United Kingdom, but also: Germany (end of the reprocessing in 2005), Belgium (moratorium on the reprocessing), Switzerland (moratorium from 2006 for 10 years).

Mr. Bordier underlines the ambiguity of the participation of the European Commission as such. If it stands for the European policy, it has to receive a mandate from the Member-States and in this case, the Member-States do not have to participate because they are represented by the European Commission.

COGEMA is very concerned about base-period and the determination of the starting point to evaluate the progress made. For France and the United Kingdom, the base-period shoud correspond to the values known in 1998 (date of the Sintra Declaration). Since 1998, important efforts have been made, and COGEMA wishes to put forward these progress in the implementation of the Convention. Reducing more some discharges could lead to very expensive investments in the future.

For COGEMA (and WNA), the discussions about the baselines were focused on the radioactive discharges. But dose and concentrations should be taken into account. The

objective of “close to zero” should be applied to the dose and consequently be based to the zero impact.

The radioactive discharges must be normalised to the energy production. For WNA, the OSPAR Convention must not be an obstacle to future industrial developments. COGEMA underlines that progress in reducing radioactive discharges is made with regard the energy production and it prefers to give priorities on discharges that have important dosimetric impacts.

At the local level, OSPAR didn't give rise to discussions. For Mr. Bordier, it can be explained by the fact that the Convention deals with long-term issues.

For COGEMA, the first answer to the OSPAR Convention lies in the commitment of progress included in the discharge authorization and in the revision of the limits and conditions of discharges every 4 years.

4.5. Interview with a Greenpeace France representative

Mr. Yannick Rousselet is responsible for the nuclear campaign of Greenpeace France. Greenpeace France does not participate to OSPAR meetings but it provides Greenpeace International with data on radioactive discharges in France.

Mr. Rousselet considers the OSPAR Convention as a political tool, useful in the perspective of obtaining thestop the radioactive discharges. OSPAR is a political and cultural arena. The value given to the Convention depends to the actors. The internationalisation of the issues at stake gives a visibility on the differences between countries regarding nuclear issues and shows that it does not exist unique solutions. Greenpeace does not claim neither to be a scientific organisation nor to supersede the authorities. It does not bring solutions to the issues at stake. But, as a pressure group, it aims at increasing the scope of the debate by emphasizing some problems which are not raised yet (carbon 14 in La Hague for example).

The strategy of Greenpeace in OSPAR is to isolate states that take “bad decisions” from its point of view. As far as reprocessing is concerned, France and the United Kingdom face the opposition of other Contracting Parties (notably from North of Europe) in favour of the end of the reprocessing. Moreover, the political announces adopted by the Contracting Parties can be used publicly and can be use as a mean of pressure on the concerned countries. For example, Greenpeace emphasizes the contradiction between the German government’s position to stop nuclear energy and the fact that Germany always sends its radioactive wastes to La Hague.

Greenpeace’s final goal consists of stopping the reprocessing. The position of Greenpeace is openly radical: zero discharges has to be reached. But pragmatically it aims at reducing the discharges for radioactive substances in a mid-term perspective. Greenpeace considers that the review of the authorisation for discharges in 2003 is in favour of COGEMA-La Hague. The real discharges have not been reduced, just the authorisations of discharges. The difference between the limits of discharges and the

real discharges is too bright and the margins of manoeuvre for the operator are too important. The new legislation for La Hague is based on a political choice of the new government and not on environmental criteria. Greenpeace refers the new authorisation to the “Conseil d’Etat”, notably because it does not comply with OSPAR commitments. On the contrary, it welcomes the UK decision to apply a moratorium for the discharges of technetium 99 and to oblige the operator of using new techniques in order to reduce them.

The national plan has been written only by the authorities concerned without the participation of NGO’s. This plan only reflects the French legislation concerning the radioactive discharges and represents the interests of the industrials. Forecasts for 2020 have not been realized. Greenpeace tries to debate about two facts:

- can reprocessing be justified ? is there a public interest for not stopping reprocessing ?
- should discharges be continued ? how to lock the radionuclides ?

Greenpeace oblige the operator to justify its releases : for example, why does it not choose to lock iodine 129 ?

Consensus between industrials and public authorities who talk about zero impact and Greenpeace which talks about zero discharges seems difficult to reach.

Mr. Rousselet notices that it is particularly difficult to lead a dialogue between authorities, operators and NGO’s in the nuclear field. The French system is so locked that Greenpeace has got no more choice than to intervene in a strong way to raise problems. There is a gap between the Greenpeace action in the field and its non invitation to participate to the discussions about the problems raised. OSPAR offers the possibility to discuss them. Mr Rousselet recognises that the GRNC is a new experience in which the recognition of pluralism is exemplary. Greenpeace does not refuse to participate to local dialogue process but it is afraid of being manipulated. Three problems about the participation of NGO’s in a dialogue process have been raised : the financial means ; the time to analyse data ; the technical competence. But Mr. Rousselet recognizes the dialogue is more and more open now.

Concerning the OSPAR process, Greenpeace does not expect a lot on the issue of discharges. OSPAR goes in circle. That is the case for the baselines. COGEMA is very clever to continuously redefine the terms of the problem. The technical debate should be replaced by real political decisions.

The influence of the OSPAR Convention in France is slight. Greenpeace tries to spread the Convention in the local context of La Hague but the subject is hardly discussed at the La Hague Plant Information Commission (CSPI).

4.6. Interview of a local NGO member

Mr. Barbey is a member of the local NGO "ACRO" which aims at controlling and monitoring radioactivity in the West of France. ACRO also sits in many official commissions.

ACRO is not directly involved in the meetings organised in the framework of the OSPAR Convention (organised at the level of the Commission or in France). However, i,n the case of radioactive substances, decisions and orientations adopted in the framework of the OSPAR Convention are of great interest for an NGO like ACRO, mainly because these decisions and orientations currently deal in priority with the reprocessing facilities.

Mr. Barbey underlines that, in the general objectives of the Convention, the wording 'eliminate the pollution" appears (art. 2.1.).[98]. But the Convention seems to not apply the same logic between the hazardous and radioactive substances. For the latter, the reference is no more made directly to discharges, but to concentrations in the marine environment[99]. For him, the Convention introduces ambiguities on this topic. Notably, in the Sintra Statement, the gereal part of the Convention mention the elimination of the pollution and seems then more restricting than that adopted for the radioactive substances.
Concerning the definition of criteria to evaluate the progress made, it seems essential to M. Barbey that the proposal from the OSPAR Convention be coherent with the research works of the European Commission or ICRP.. The existence of several forums about this question makes possible the expression of different points of view.

In particular, the determination of environmental quality criteria at the OSPAR level are not very developped. He thinks it is important that the scientific debate about these criteria be not disconnected from the societal debate. In this context, the precautionary principle should be applied. Moreover, he wonders how the reference group at the local level is taken into account to assess the OSPAR objectives.

Mr. Barbey considers that the choice of radionuclides for the baselines seems to be strongly influenced by Sellafield and does not cover sufficiently the radionuclides present around La Hague. Furthermore, the decrease of the radioactive discharges from COGEMA-La Hague is essentially due to the decrease of the production and not to progress made in the prevention of pollution.

The different local stakeholders were not appealed to participate to the drafting of the national plan although the issues at stake concern them.

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[98] Art.2.1. : "*"taking all possible steps to prevent and **eliminate pollution**"*.

[99] *"the Commission will ensure that discharges, emissions and losses of radioactive substances are reduced to levels **where the additional concentrations in the marine environment above historic levels**, resulting from such discharges, emissions and losses, **are close to zero**."*

Moreover, Mr. Barbey thinks that it would be necessary to favour the harmonisation of the criteria and objectives for the chemical and radioactive substances. This is all the more important since there is currently a willingness to take into account the chelical discharges of nuclear installations.
Until now ACRO is not really involved in the understanding of the OSPAR Convention. At the local level, OSPAR is just known because of the objective to achieve “discharges close to zero in 2020”. The framework of the Convention is badly known. At the Local Information Commission of the COGEMA-La Hague plant (CSPI), Greenpeace is the only NGO to spread information about it. OSPAR is seen as an international agreement in which local NGO’s are not consulted although the problems raised are also local issues.

At last, Mr. Barbey has got reservations about the polluter-pay principle. It does not mean that the pollution will be reduced ; if an operator has got enough financial resources, it can keep on polluting.

THIRD PART :
DESCRIPTION OF THE RISK GOVERNANCE PROCESS CONCERNING THE CHEMICAL SUBSTANCES MERCURY RELEASES FROM CHLOR-ALKALI INDUSTRY

1. CONTEXT : MERCURY RELEASES AND THE PROTECTION OF THE MARINE ENVIRONMENT

Since the Minamata mercury pollution in the 1950s, mercury has been increasingly in the focus of pollution prevention and control policies as one of the major hazardous substances. Initially considered as a local problem, mercury pollution is now also understood to be global, diffuse, and chronic.

Mercury is a PBT substance, i.e. it is Persistent, Toxic and Bioaccumulates. The impact of mercury on health ranges from adverse neurodevelopmental effects, toxic effects on the nervous system to adverse effects on the cardiovascular, immune and reproductive systems and the kidneys. Once released in the nature, mercury is likely to turn into methylmercury and bioaccumulates in the food chain with risks for animal and human health. Mercury is volatile and its emissions are spread over long distances in the atmosphere and in the oceans. The more vulnerable populations are those living by the sea with a high intake of fish.

Mercury emissions sources are coal combustion, industry and small-scale gold mining. As regards industry, the chlor-alkali industry which produces chlor for the synthesis of PVC is one of the main sources in most European countries.

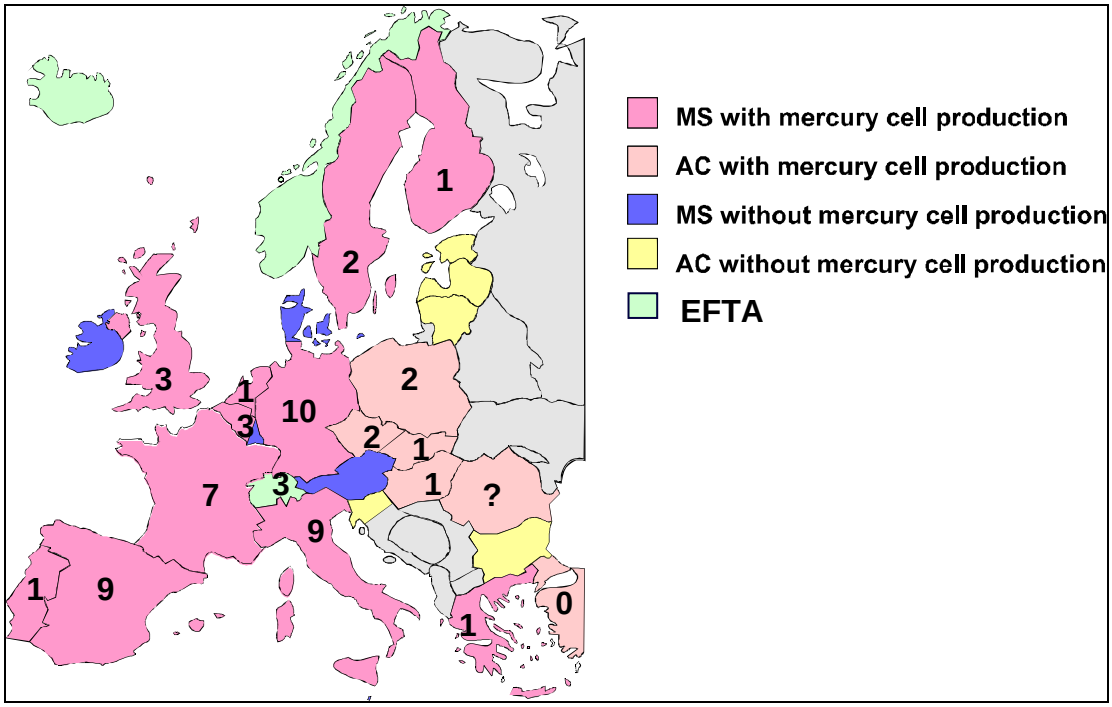
Because of its volatility, mercury is covered by the UNECE 1998 Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution (LRTAP) on Heavy Metals. However in Europe the most significant steps were taken in the framework of the regional OSPAR convention, and more recently by the European Commission.

1.1. Mercury-cell technology for chlor-alkali production

The chlor-alkali industry produces chlorine (Cl2) and alkali, sodium hydroxide (NaOH) or potassium hydroxide (KOH), by electrolysis of a salt solution. The main technologies applied for chlor-alkali production are mercury, diaphragm (asbestos) and membrane cell electrolysis. The mercury cell and diaphragm processes date from the late 1800s while the membrane cell electrolysis developed in the second part of the 20th century. Unlike Eastern Europe, Japan and the United States, chlorine production in Western Europe shows a predominance of the mercury-cell process (54% of chlorine capacity 2001). There are about 40 mercury-cell chlor-alkali plants in the OSPAR region. The chlor-alkali industry employs about 40,000 people in Western Europe and the total conversion cost, on the basis of figures provided by Euro Chlor, was estimated at € 3,100 million in 2001.

In 2000 the chlorine production capacity from mercury cells in Western Europe was 6.2 million tonnes. Due to the process characteristics, mercury can be emitted from the process through air, water, wastes and in the products. The total mercury emission to air, water and products from chlor-alkali plants in Western Europe was 9.5 tonnes in 1998, ranging from 0.2-3.0 g Hg/tonne of chlorine capacity at the individual plants.

Number of mercury-cell chlor-alkali plants
in the European Union, EFTA and Accession Countries in 2001



MS = Member States AC = Accession countries
EFTA = European Free Trade Association

Source : *Report from the Commission to the Council Concerning Mercury from the Chlor-alkali Industry, COM(2002) 489 final*

1.2. PARCOM 90/3 Decision

On 8 March 1990 the Ministerial Declaration of the Third International Conference on the Protection of the North Sea, convened at the Hague (Den Haag) agreed that :

- "Existing mercury cell chlor-alkali plants should be phased out as soon as practicable on a national basis with the objective that they should be phased out completely by 2010.
- Mercury based chlor-alkali plants should be required to meet, by 1996 a limit value of 2g Hg/t Cl2 capacity for emissions to the atmosphere, unless there is a

firm commitment that the plant will be converted to mercury-free technology by the year 2000.
- Mercury in hydrogen which is released to the atmosphere, or is burnt, shall be included in this standard."

The PARCOM decision 90/3 of 14 June 1990 on reducing atmospheric emissions from existing chlor-alkali plants built on The Hague (Den Haag) ministerial declaration.

"Contracting Parties to the Paris Convention for the Prevention of Marine Pollution from Land-Based Sources AGREE:
- that existing mercury based chlor-alkali plants shall be required to meet by 31 December 1996 a standard of 2g Hg/t Cl2 capacity for emissions to the atmosphere, unless there is a firm commitment that the plant will be converted to mercury-free technology by the year 2000;
- that mercury in hydrogen which is released to the atmosphere, or is burnt, is to be included in this standard;
- AND RECOMMEND that existing mercury cell chlor-alkali plants be phased out as soon as practicable. The objective is that they should be phased out completely by 2010."

The Hague (Den Haag) declaration in march 1990 and consequent PARCOM decision in June 1990 were prompted by pressure from NGOs on governments in the 1980s both on PVC and on mercury. The recommendation (3rd paragraph) in the decision is a result of a political trade-off that is revealing of OSPAR nature: phase-out is put on the agenda, but the extent to which this measure effectively applies is unclear. The binding nature of the recommendation will actually be a matter for discussion throughout the 1990s. As regards the paragraph 2 of the 90/3 decision (standard of 2g Hg/t), it was met in due time by all concerned facilities according to an OSPAR report made in 1996.

2. PARTICIPANTS

Discussions on mercury took place in the Hazardous Substances Committee which gathers experts from the Contracting parties and stakeholders as observers.

Important stakeholders on mercury are the industry union (Eurochlor) and Greenpeace.

2.1. Contracting parties

Any work on a hazardous substance carried out in OSPAR is led by one or two countries in cooperation with OSPAR secretariat. In the case of mercury losses activities are led by Spain and UK. Both have mercury cell facilities. Spain hosts the most important mercury mine in the world.

Ten countries out of 15 contracting parties (EU excluded) have mercury cell facilities : Belgium, Finland, France, Germany, the Netherlands, Portugal, Spain, Sweden, Switzerland, UK.

2.2. Eurochlor

Euro Chlor is an affiliate of the European Chemical Industry Council (Cefic). Euro Chlor represents European chlorine producers employing more than 40,000 people at 82 plants in 18 countries. Full members are producers of chlorine in: Austria, Belgium, the Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

Euro Chlor defines its role as "working to:

- improve awareness and understanding of the contribution that chlorine chemistry has made to the thousands of products, which have improved our health, nutrition, standard of living and quality of life;
- maintain open and timely dialogue with regulators, politicians, scientists, the media and other interested stakeholders in the debate on chlorine;
- ensure our industry contributes actively to any public, regulatory or scientific debate and provides balanced and objective science-based information to help answer questions about chlorine and its derivatives;
- promote the best safety, health and environmental practices in the manufacture, handling and use of chlor-alkali products in order to assist our members in achieving continuous improvements (Responsible Care)."

Eurochlor is an active observer of OSPAR activities since the beginning of the 1990s. The discussion on the concept of PBT (persistent, likely to bioaccumulate and toxic pollutants) and the impact of the 90/3 decision were two important matters that motivated a strong involvement of Eurochlor in OSPAR activities.

2.3. Greenpeace

Greenpeace contributed to put pressure on the chlor industry in the 1980s to phase out mercury cell technology. Following the 90/3 decision with the phase out recommendation, it participated in OSPAR working groups to review the implementation of measures at national level.

Up until 1998 Greenpeace was only allowed restricted access to the meetings. It was possible for NGOs to present papers on a first open stage. Then the working groups were closed to observers. An important decision made in Sintra was to open about all meetings to observers.

Thanks to its scientific laboratories, Greenpeace also contributes data and makes sure that OSPAR has all the information available. It engages in technical discussions on the properties of chemicals and fate in the environment. Its scientific expertise enables the NGO to analyze the data provided by experts and to review risk assessment studies. Greenpeace participated in the definition of the PBT concept within OSPAR.

Greenpeace has an interest in the new developments in European chemical policy and makes regular comments on the steps taken in the EU, first of all on the principles of this policy.

3. ISSUES AT STAKE

3.1. The review of PARCOM 90/3 decision

3.1.1. A request from the industry

The chlor industry was not much involved in OSPAR work in 1990 when it realized the impact of the decision. This decision actually was one of the main reasons for a greater involvement from the industry in OSPAR work in the beginning of the 1990s. OSPAR appeared then to be an arena where important decisions were made with significant impact on the operation of facilities. Beside decisions on individual substances, OSPAR also started to build a methodology in order first to define chemical pollution (PBT concept: substances with hazardous intrinsic properties of Persistence, liability to Bioaccumulate and Toxicity), then to classify and prioritize substances (DYNAMEC process), and eventually to specify actions to further assess and reduce their impact.

Industry agreed in principle with the ban of mercury technology but not with the time-table assigned by OSPAR, and the rationale for the phasing out process. Companies considered that it was already possible to reach negligible impact and to operate the facilities in a sustainable way until their “natural” end of life. They engaged in OSPAR to dispute the 90/3 decision both on legal ground, and on technical criteria.

On the legal ground, the chlor industry argued that the phase-out was not a binding decision. It happens that the phase out is only a *recommendation*, but it is part of a larger statement which is labelled as an OSPAR *decision*. All contracting parties have supported the 90/3 decision and they are committed to implement it. However does this commitment also apply to the recommendation ? Taking advantage of this legal ambiguity, the industry has insisted that this recommendation is not mandatory, and requested OSPAR to give a clear statement on this issue.

On the technical side, the industry made important efforts to reduce discharges and made numerous studies to assess the level of pollution. First, studies were made to agree on common assessment principles and objectives (since the mercury cell chlor-alkali plants were not all similar). Then, impact assessment was made around the sites on air, water, vegetables, and so on… Feedback experience and epidemiological studies were also carried out. The fact that the facilities dispose of a join task force through their Union (Eurochlor) was a great help in the process to gather and harmonize the data. OSPAR meetings made it possible to share this with OSPAR Contracting Parties. The industry pointed out that the current releases from mercury cells was very low with BATs compared to the historic pollution. The impact was considered trivial, provided that proper investments were made in the facilities to make the process cleaner with good practices. It was then argued that the overall amount of discharges would be less if

the plants would carry on their activity, making an effort to keep on decreasing discharges than if the plants would close in 2010 with no incentive to reduce the level of discharges. Consequently the industry requested to let mercury cell chlor-alkali plants operate until the end of their operation life time.
In 1998 during OSPAR meeting EuroChlor made a statement that :

a. "the levels of emissions and discharges of mercury had decreased over the last 20 years by 98-99% (to products and water) and by 91% (to air);
b. there was potential to make further substantial reductions estimated at about 50% over the next 10 years;
c. the huge investment (3.5 to 4 billion ECU) to replace all mercury cells with membrane cells within the next 10 years was unlikely to be justified on any economic grounds. With present and anticipated levels of mercury emissions, there was no sustainable environmental argument to justify such an investment. Moreover, the environmental impact of such residual emissions was more dependent on their cumulative amount until phase out rather than on their detailed timing;
d. there would be no further investment in Western Europe in mercury cell technology. Where economic circumstances warranted it, mercury cell plants would be converted to membrane technology. Otherwise, when plants reached the end of their economic lives, they would be closed."

3.1.2. OSPAR's review of the implementation of 90/3 decision

Reporting on mercury losses

In OSPAR work, important efforts are made to assess the mercury losses in the environment. The data collection is based both on reports by the industry and the national authorities. The fact that the chlor industry is structured in a European organisation (Eurochlor) significantly helps the collection of data. The purpose of the work achieved is first to provide a consistent and overall picture of mercury losses from chlor-alkali industry in OSPAR region. Guidelines were worked out by Eurochlor to improve the assessment methodology among OSPAR parties and the comparability between contracting parties as well as between individual plants of contracting parties. Secondly, this assessment is essential for OSPAR to check and explain any case of apparent increase in mercury-cell chlor-alkali production capacity (and/or in mercury emissions) reported by contracting parties.

The review of the phase out implementation

The Contracting parties were faced with a situation where the legal status of the phase out decision was unclear and new arguments were made to reconsider the recommendation. Notably the report on mercury losses made obvious that the releases were very low compared to the years preceding the 90/3 decision. Moreover each country bears the responsibility to implement the 90/3 decision in its own national context.

During two years informal intersessional work took place to consider options regarding the implementation of PARCOM Decision 90/3. The first option was to leave the existing Decision unchanged (2010 deadline). The alternative was to replace Decision 90/3 with a new OSPAR decision (review of the 2010 date).

OSPAR Convention requests that decisions are reviewed every ten years. In 1999 an OSPAR workshop was hosted by Spain to discuss the 90/3 decision. The objective of the workshop was "*to consider the future of OSPAR work on the chlor-alkali industry and the various issues and problems associated with this, in particular the implementation of paragraph 3 of PARCOM Decision 90/3 on Reducing Atmospheric Emissions from Existing Chlor-Alkali Plants.*" This covered different issues :

- The implementation of the paragraph 3 recommendation; a discussion was held on the implementation in the different countries and on the various proposed solutions.
- The assessment of mercury losses and problems of reporting, comparability of data and transparency associated with OSPAR measures and reports.
- The work on BAT for the chlor-alkali sector in other international organisations (first of all EC) and its relationship to work on this sector carried out in OSPAR.
- Strategy and measures for site remediation and safe disposal of mercury and its compounds arising from the phase-out of mercury cell chlor-alkali technology.

The meeting was chaired by Mr Juan Martinez, representing the Spanish Ministry of Environment. Part of the meeting was chaired by Mr Richard Moxon, from the UK Department Environment, Transport and the Regions (DETR), as a technical chairman for OSPAR meetings on chlor-alkali issues. The meeting was attended by representatives from contracting parties (Belgium, European Community (EC), Finland, France, Germany, the Netherlands, Portugal, Spain, Sweden and the UK), the United Nations Economic Commission for Europe (Convention on Long-range Transboundary Air Pollution), and Euro Chlor as a NGO. This workshop was mainly devoted to discussions between contracting parties and the industry. The purpose was among others to hear the industry arguments : it was not open to environment protection NGOs. This limited access is possible for so-called intersessional meetings.

During the 1999 workshop, several countries explained their action and their views for the future steps. Considering the fact that it was already possible for Netherlands to reduce by 80-90% mercury emissions in 2010 compared to 1985, the Dutch representative outlined a proposal by which the phase-out could be spread in time via a 4 year budget period (from 2008-2012). The Belgian delegate stressed the specific situation of his country with the highest chlorine production capacity per capita of all OSPAR Contracting Parties and relatively new mercury-based process and production units. He expressed difficulties with the timing of the phase out. The French representative pointed out that France had already implemented in 1991/1992 the recommendation set out in paragraph 3 of PARCOM Decision 90/3. The French Ministry of the Environment asked, on a plant-by-plant basis, for an environmental and human health risk assessment and an assessment of the economic impact of implementing measures (e.g. BAT) to reduce mercury emissions (see below the French example). The French authorities considered this information a pre-requisite for any discussions on a postponement of the phase-out stipulated in PARCOM Decision 90/3.

The chlor industry presented an alternative strategy to the implementation of the recommendation of the 90/3 decision. It requested attention on this proposal with the hope that this would make possible a review of the decision. Eurochlor strategy develops six commitments (see details in Annex 1) :

- No further development of mercury technology
- No transfer to third countries
- Reduction programme for releases with more ambitious targets than the decision 90/3
- Data on releases to be transmitted to OSPAR
- Development of a BEP for decommissioning and waste management
- Mercury cell chlor alkali plants to operate till end of life

Conclusion of the workshop

Finally, there was no consensus among contracting parties for the development of a new OSPAR decision on this issue. OSPAR considered that it was now up to each contracting party to state whether the recommendation included in the 90/3 decision was binding or not. This issue was a matter for national implementation, and no longer for intergovernmental discussion within OSPAR. However OSPAR agreed to institute a regular reporting procedure to examine:

- national progress on implementation generally
- how the commitment in the OSPAR Convention to the application of best available techniques is being fulfilled

3.1.3. Implementation of PARCOM 90/3 decision at the national level : the French example

In France the mercury cell technology is the most developed technology for the chlor-alkali production as in other West European countries. There were until recently 7 mercury cell facilities operating.

In 1991 the French Ministry of Environment released an order on mercury releases from chlor-alkali facilities using mercury technology (*Arrêté du 21 novembre 1991 relatif aux rejets de mercure en provenance d'installations classées pour la protection de l'environnement du secteur de l'électrolyse des chlorures alcalins*). The text refers to the third International North Sea Conference (INSC) and its march 1990 declaration, and not to PARCOM 90/3 decision which is however more formally binding. It covers existing facilities as well as new ones. It sets emission limits to 1,0 g Hg/t capacity and 2,0 g Hg/t capacity as an average for daily releases. This stems from the INSC and OSPAR limits but whereas INSC and OSPAR speak of limits for *emissions to the atmosphere*, the November 1991 French arrêté provides norm for liquid releases.

The text doesn't ban the technology and even authorizes the creation of new mercury cell units provided they apply the "best available technical means" and that releases remain under the new limits (art. 10). In the meantime it is requested to review every

four years emission limits "*in accordance with the objective to stop mercury releases from chlor alkali mercury cells on 31 december 2009.*" (art. 11).

In 1998 in the framework of a broad order on industrial releases (*Arrêté du 2 février 1998 relatif aux prélèvements et à la consommation d'eau ainsi qu'aux émissions de toute nature des installations classes pour la protection de l'environnement soumises à autorisation.*), revised emission limits are fixed for mercury releases. The text actually completes and updates the 1991 order :

- the INSC and OSPAR emission limits (2 g/t capacity) which were included in French law by the 1991 order for water releases now also apply to air releases
- the emission limit for water releases is detailed : liquid releases should not exceed 0,5 g/t capacity per production unit[100].

Moreover it is now forbidden to start new mercury cells. Existing ones must abid by the legal limits. However if there is firm commitment from the facility to convert to a mercury free technology by 2010, the limit for air releases doesn't apply.

In march 2000 (*Circulaire du 7 mars 2000. Installations classées pour la protection de l'environnement. Installations de production de chlore par electrolyse à mercure.*), the Ministry of Environment requested the French mercury cell facilities to provide an impact assessment by 30 July 2001. To explain this requirement the Ministry states that *"the evaluation of the health and environmental impacts, undertaken in France around the classified installations, seems a fundamental aspect of the [*mercury cell issue*]. It does not appear indeed possible to me to reconsider a decision announced ten years ago without all the impacts being clarified so that the debate can proceed in a balanced and transparent way, taking into account the whole of economic, health and social dimensions. Discussions between the Minister, the French trade association concerned (Syndicat des Halogènes et Dérivés) and INERIS[101], allowed the development of a reference file to assess the health and environmental impact of the mercury discharges. This evaluation will be done on the basis of common methodology which was made available to the facilities in 1999."*

This impact assessment includes :

- evaluation of mercury concentrations in the vicinity of the facility (in water courses and ground water, soil and plants, fish)
- assessment of health and environmental impact associated with mercury discharges
- evolution of mercury discharges in the past ten years
- technical and economic evaluation of the actions taken to reduce mercury releases in air, water and waste in the past ten years
- possible new actions
- socio-economic aspects associated with the conversion to alternative technologies

[100] Both limits are average monthly limits. The average daily limit is double the average monthly limit.

[101] Institut National de l'Environnement Industriel et des Risques is the expert to the authority as regards hazardous activities mainly from the industry.

- expected discharges if the 2010 deadline is postponed

The Ministry of Environment has invited the French mercury chlor alkali industry to convene in a workshop with stakeholders by the end of 2003 to inform about this assessment and the actions taken, as well as to discuss the new measures to be developed. This workshop will also be an opportunity to discuss the 2010 deadline taking into account both the health and environmental impact assessment of the cells and the socio-economic impact of their operation and possible closure. According to a representative of the French ministry of Environment, one difficulty in the French context lies in the fact that companies were unable to overcome competition and reach an agreed position on the phase out issue whereas in Germany for instance the industry developed a joint phase out time table.

3.2. Steps at EU level : an increasing competition for OSPAR

3.2.1. The EC involvement in pollution prevention and control

The Council has not formally approved OSPAR Decision 90/3. The Community therefore considers it has no obligation to act in compliance with it. However in December 2001 the European Commission released a Reference document on best available technologies in the chlor-alkali manufacturing industry according to Article 16(2) of Council Directive 96/61/EC (IPPC — Integrated Pollution Prevention and Control). The document refers to membrane technology as the Best Available Technique for the production of chlor-alkali. As regards mercury cell plants it specifies that the BAT is considered to be conversion to membrane cell technology, and details the measures that should be taken to protect the environment during the remaining life of mercury cell plants. However according to IPPC Directive, when determining for the individual installation the permit conditions, based on BAT, the national authorities take into account the technical characteristics of the installation concerned, as well as its geographical location and the local environmental conditions.

In 2002 the European Commission reported to the Council on mercury from the chlor-alkali industry. The report underlines that the IPPC Directive is the only legally binding instrument that governs the phase-out of mercury cells, while it reminds that “the mercury-cell process is not considered to be BAT for the chlor-alkali sector and it will be for the local competent authority to decide on BAT-based permit conditions for individual installations on a plant-by-plant basis.”

At the EU level the topical question is no longer the time-table of phase out. OSPAR and IPPC provide efficient tools for national authorities to move towards the phase-out while ensuring with the support of BAT that the operating plants reduce their environmental impact.

As the 2010 deadline comes closer, the concern is the management of mercury remaining from future decommissioned facilities. Mercury cells in the European Union currently contain some 10,000-12,000 tonnes of mercury. Another 3,000 tonnes are

contained in plant, buildings and waste. The total amount of mercury to be decommissioned will be approximately 12,000-15,000 tonnes.

The industry proposed a solution by having mercury from decommissioned plants recycled in Almaden mines in Spain, which are the largest mercury mines in the world. The agreement with Minas de Almadén is part of the West-European chlor-alkali producer's strategy for a safe disposal of metallic mercury from shutdown cells (see Commitment 6 of the strategy - annex 1). It was introduced as a trade-off to postpone the 2010 delay for phasing out. Following its position not to come back to the 90/3 decision, OSPAR considered it more appropriate to take action on decommissioning within the framework of the European Community.

3.2.2. OSPAR agenda setting in the EU environment : OSPAR conclusions as regards the increasing EC involvement in hazardous substances regulation

From the moment the IPPC Directive came into action, the programme of OSPAR activities on hazardous substances was somewhat challenged. There are a number of similarities between the two processes :

- a review is made to prioritize hazardous substances and to make an extensive assessment of their characteristics
- Reference documents are produced to identify best available technologies
- This process involves the public authorities, with institutional experts, as well as representatives of industry and additional stakeholders (consumers, environmental protection NGOs)

Nevertheless the resources and status of the work done by the two organisations are quite different :

- an OSPAR decision is only binding to contracting parties that signed it
- participation of industry in assessment (first of all, to provide data) is mandatory only in the EU regulation

OSPAR has acknowledged this difficulty and seeks ways to complement rather than to compete with the EU.

In 1998 when examining IPPC Bref documents, the Chairman of OSPAR POINT Committee stated that "*it was important that the planning of the BAT/BEP review of POINT-related (OSPAR) measures could be brought in line with the actual planning of IPPC/BREF documents in order to avoid duplication of work and to make best use of the activities which were being carried out (or planned) within the EC and the OSPAR framework.*" It was also pointed out that "*the added value of the OSPAR BAT work was the special emphasis on measures relating to substances identified for priority action in the context of the implementation of OSPAR's Strategy with regard to Hazardous Substances. This important element of the protection of the marine environment should be stressed by Contracting Parties which were involved in the IPPC/BREF work.*"
One of the assets of its work as OSPAR points out is its focus on the protection of the marine environment whereas the EC has a wide range of responsibilities and has to

balance various concerns (environment protection, industry development, employment, consumer protection…).

4. STAKEHOLDER VIEWS

4.1. OSPAR secretariat

Following the 90/3 decision most discussions on mercury took place at the technical level in working groups where the reduction of releases and the level of mercury losses in the environment were reviewed. Nonetheless the strong and continuous request from the industry to reconsider the recommendation progressively put the debate on the political level.

First chlor alkali plants considered they would turn to the mercury-free membrane technology. However recession made their position more difficult. Then they wanted to discuss the implementation of the 90/3 decision. Their purpose was not to avoid the ban, which was all justified but to try to find ways for a consistent approach to phase out in Europe.

However some Contracting Parties were already well engaged in the phase out process and it seems that national authorities in these countries feared NGO pressure or possible law suits from their national industry.

OSPAR secretariat has assisted this process by leading the discussion first at the technical level, then at the political level. Eventually no agreement was reached because of a lack of consistent views among contracting parties.

4.2. Eurochlor

At the end of the 1980s and beginning of the 1990s, the PBT concepts started to be elaborated within OSPARCOM activities. The industry was concerned about the definition of this concept. It feared that there would be no difference made between all substances considered as Persistent Bioaccumulable and Toxic and that stringent measures would apply equally to all of them. From this moment it made important efforts to take part in OSPAR discussions.

For the industry OSPAR is an opportunity to contribute to the governance of hazardous substances and to show competence and responsibility. The industry has been providing OSPAR working groups with data on facilities and releases, and has assisted OSPAR process with technical expertise skills. It has been regularly presenting before Contracting parties the efforts made to reduce discharges : it has been taking an active part in the regular review of OSPAR decisions, once again by providing data from the production units, and transferring to OSPAR the collected information gathered at European level by Eurochlor. This participation is non-mandatory.

There was also interest from the industry to show that it did not limit its responsibility to the legal requirements and could develop voluntary strategies that met OSPAR general goals. Through its 6 voluntary commitments strategy the chlor industry insisted that it intended to take responsibility not only for the reduction of releases but also for the decommissioning of mercury cell facilities : the agreement with Almaden mines was a demonstration that the industry expresses concerns as regards a potential transfer of risk to third countries, and that it was able to organize the corporation and make a volunteer management on this issue.

Interestingly a representative of the chlor industry lists the following items to characterize the role of industry in OSPAR Hazardous Substances policy :

- Contribution to the definition of the concept of hazardous substances using scientific criteria (persistence, bio-accumulation and toxicity)
- Contribution to the development of the DYNAMEC process for the selection and the priority setting of hazardous substances
- Introduction of a stage of evaluation, by a small group of experts (among them one expert from the industry) of the quality of the data used to select the hazardous substances
- Introduction of the possibility to remove the substances from the list of the dangerous substances on the basis of additional data provided by the industry. It is the only system which envisages an "un-selection" and which applies it
- Introduction of the principle of risk assessment which was not included in the approach of OSPAR
- Getting the right of collaboration with the authorities in the preparation of the risk assessment and risk mitigation file for priority substances
- Getting a delay before the publication of the list of selected substances, to allow industry to comment on or to modify the relative data
- Continued action to raise awareness about the practical difficulty to implement the OSPAR "zero emission" objective

He adds that these results would not have been possible without a regular participation in meetings, a positive attitude from the industry towards OSPAR activities, and trustworthy relations with the national authorities.

The rationale for the industry’s involvement is that the decisions taken by OSPAR should be as much scientifically grounded as possible. Its participation in the definition of the PBT concept is a clear example of that.

4.4. Greenpeace

Greenpeace opposed the industry strategy. The industry had said that if the 2010 deadline was postponed, they would invest more in risk mitigation. According to Greenpeace, this implied that, unless this request was met, investments would not be made to strengthen discharge and emission controls before 2010. This strategy was putting OSPAR in a difficult situation. In essence, the chloralkali industry was presenting OSPAR with an ultimatum by making any actions to reduce further its

releases of mercury conditional on its demands being met. Greenpeace maintained throughout that OSPAR should hold to its 2010 deadline for phase-out of mercury cells and that the industry should, in the interim, meet its responsibility further to reduce discharges, emissions and losses of mercury to the marine environment

Greenpeace participates in technical discussions on BATs. However it considers that BAT remains first and foremost an "end of pipe process": it aims at controlling the releases without questioning the upstream process. It deals with what is produced more than with the production process and the material that are used in the process. While participating in the technical discussions, Greenpeace also tries to bring the issue back to substitution, to shift from risk mitigation to risk avoidance. In this respect, the NGO underlines the limits of Quantitative Risk Assessment. Effects can take place at the level detected near the plant even if it is below a regulatory level: there are concentration, combination processes. Moreover, given the propensity of mercury to undergo long-range transport through the biosphere and to accumulate in biological systems, all avoidable releases must be prevented as soon as possible. One cannot say that releases are acceptable for marine environment just because they are below regulatory limits.

As regards the increasing role of EU regulation, there is interest from Greenpeace that measures taken in the field of the marine protection from hazardous substances are more enforceable. In this respect the EU directives are putting more onus on its members than OSPAR can do on its contracting parties. On the other hand, the asset of OSPAR remains that it deals only with the protection of the sea, such that there is less incentive to compromise environmental protection goals with other social or economic concerns.

4.5. The French Ministry of the Environment

During the 1999 workshop on chlor alkali, the French Ministry of the Environment asked, on a plant-by-plant basis, for an environmental and human health risk assessment and an assessment of the economic impact of implementing measures (e.g. BAT) to reduce mercury emissions. This information was considered a pre-requisite for any discussions on a postponement of the phase-out stipulated in PARCOM Decision 90/3.

The purpose of this proposal was to make an as sound as possible assessment of mercury releases to determine OSPAR position on its 90/3 recommendation. A confirmation of a phase out decision actually requests strong arguments in the face of its economic and social impact. In order to avoid a situation where important gaps would occur between contracting parties in the implementation of the decision, it was useful to try and find a common European position on this issue.

Although this proposal was supported by some countries, it was eventually met with the answer that local releases are not directly relevant in OSPAR discussions.

Given the increasing role of the EU in chemical policy, the interest French representatives take in OSPAR activities on hazardous substances is now weakening. It is acknowledged that OSPAR remains an important arena to progress and promote new approaches to the protection of marine environment. Nevertheless as far as hazardous

substances are concerned there are significant redundancies in the activities carried out by OSPAR and the EU. Because of its more binding character the EU framework appears to be more effective and draws most resources from OSPAR Contracting Parties which are EU-members. For instance, whereas in the EU framework a country assessing the chemical properties of a given hazardous substance would be able to oblige the industry to provide data, OSPAR has no authority on the industry to provide cooperation.

FOURTH PART : FIRST ANALYSIS

1. THE GUIDING PRINCIPLES OF THE DECISION-MAKING PROCESS

According to the OSPAR Convention the measures and steps taken to reduce or eliminate pollution associated with hazardous and radioactive substances shall apply :

- the precautionary principle
- the polluter pays principle
- best available techniques (BAT) and best environmental practice (BEP)

Hazardous substances

As regards hazardous substances more specifically, the Sintra strategy in 1998 added the principle of substitution, i.e. the substitution of hazardous substances by less hazardous substances or preferably non-hazardous substances where such alternatives are available. The phase-out recommendation included in the 90/3 decision on mercury releases is based on that principle. The existence of the membrane technology allows shifting to a mercury free production of chlorine.

Also important is the development of BAT. The development of Best Available Techniques aims at reducing the pollution from hazardous activities. The scope of these techniques is wide. They can cover the substitution principle. For instance, the BAT for mercury technology in the 2001 BREF in the chlor alkali industry is considered to be a shift to membrane technology. Very often however BATs specify the available techniques that are the more appropriate to reduce the releases using the same hazardous substance. BAT are the result of an investigation process which combines innovation and risk assessment : what are the newest techniques used, what are their relative impact on the environment, on safety at work and on products safety ?

Radioactive substances

As far as radioactive substances are concerned, the question of substitution introduces a debate and is at the origin of divergences among the contracting parties. Does it apply at the level of the whole practice (i.e. electricity production with nuclear energy)? Does it mean to discuss the justification of the reprocessing option?

In fact, the current concern on radioactive discharges within OSPAR is focused on the two reprocessing plants and thus the debate on substitution is a rather difficult issue: two countries (France and UK) have direct economic interests in the debate while the others are less concerned by the economic point of view. In this perspective, it has to be noticed that the OSPAR decision related to the "reprocessing option" (this decision was favouring the non-reprocessing option) was signed by the contracting parties, except France and UK, and thus do not apply to these countries which are the only one having reprocessing plants.

Therefore, although it seems impossible to reach a consensus among the contracting parties within OSPAR on the issue of the justification of the reprocessing option, it creates a forum for discussing the issue and providing arguments in favour and against the different possible strategies. In this context, OSPAR creates the debate but does not impose solutions.

With regard to the radioactive substances, the recommendation 91/4 relies on the application of BAT to reduce marine pollution. In order to facilitate its implementation, the Contracting Parties refer to the "guidelines for the submission of information about, and the assessment of, the application of BAT in nuclear facilities"[102] which provide them with some BAT indicators. The downward trends of radioactive discharges can be considered as the main indicator of BAT use. No listing of BAT was until now dressed. In fact, the concept of BAT concerning the radioactive substances is not as developed as the one for chemical releases. It is not a key-point of the debate between experts at OSPAR. The discussions take rather place at the national level according to each installation.

2. THE IMPLEMENTATION OF DECISIONS AND REVIEW

A basic principle in OSPAR convention is that the implementation of decisions and even more of BAT is a matter for contracting parties. They specify the objectives set in an OSPAR decision or apply the BATs defined by the Convention taking into account the national and local context. it has to be reminded that the "decisions" or the "recommendations" are voted either with unanimity, or by a three-quarters majority vote. In the latter case, the "decision" only binds the Contracting Parties who voted it. The "recommendations" have no binding force.

The commitment taken by contracting parties still is that they have to show that they act consistently with their vote, and they cannot avoid presenting in front of other parties the efforts they make to implement every decision they supported.

Hazardous substances :

This is a typical feature of BAT that it is not a binding tool, and its application needs to be tailored or adapted according to the technological and economic situation of the plant. As the Convention underlines :

"In determining whether a set of processes, facilities and methods of operation constitute the best available techniques in general or individual cases, special consideration shall be given to:
(a) comparable processes, facilities or methods of operation which have recently been successfully tried out;
(b) technological advances and changes in scientific knowledge and understanding;
(c) the economic feasibility of such techniques;
(d) time limits for installation in both new and existing plants;
(e) the nature and volume of the discharges and emissions concerned.

[102] Agreement 1999-11.

It therefore follows that what is "best available techniques" for a particular process will change with time in the light of technological advances, economic and social factors, as well as changes in scientific knowledge and understanding."

This approach is much consistent with the very nature of the intergovernmental OSPAR convention, where action remains dependent on the contracting parties' initiative.

The fact that eventually OSPAR decided that it could not change the 90/3 recommendation, either by postponing the deadline, or by turning the recommendation into a binding decision reflects the low capacity of enforcement and control that the Convention has on Contracting parties. In this loose control may also lie its ability to set ambitious goals.

In the meantime OSPAR continues to request a review of the 90/3 implementation from contracting parties at the national level. This is the only tool to check progress, but it is efficient in putting the onus on contracting parties. Although the time-table of the original phase-out recommendation might not eventually be respected by all concerned countries, the recommendation is progressively being implemented. The 90/3 decision was not adapted, and the goal remains. One may wonder what commitment would have been taken on mercury cell technology by contracting parties if the decision had been binding.

Radioactive substances

Within the framework of assessing the implementation of OSPAR Strategy for radioactive substances, the contracting parties have to present a national plan. It is the responsibility of the contracting parties to produce this plan, but OSPAR cannot evaluate the plan, it just takes note of it.

The decisions on reprocessing (review of discharge authorisations and, reduction or elimination of discharges from reprocessing plants) where taken by part of the contracting parties with a view to implement the non-reprocessing options. They were not voted by the two countries which have the reprocessing plants. This case shows particularly the apparent weakness of the decisions as the countries can decide or not to implement the decisions.

However, even if the OSPAR decisions or recommendations are not legally binding for the contracting parties, it appears that the political decisions taken by the countries in the framework of the OSPAR Strategy (like for example the Sintra or Bremen statements) progressively commit them towards the implementation of the strategy.

3. THE ROLE OF EXPERTISE

The work achieved within OSPAR often seems the result of tensions between political discussions and technical arguments.

Hazardous substances

The two main principles that drive OSPAR process in governing hazardous substances are substitution and Best Available Techniques :

- The input of expertise in the discussion over substitution is rather limited. As the mercury cell example has shown, arguments on substitution target at justification and — once the possibility of substitution is agreed — on the terms of a shift from one technology to another, for instance on the time frame. Risk assessment and the estimation of the balance between the costs and benefits of a technology are less relevant as soon as there is an alternative solution.

- The preparation of BAT implies important scientific and technical efforts to gather data, develop and assess technologies. Nonetheless the delineation between expertise and negotiation is uncertain as soon as BAT are to be interpreted and implemented. As stressed above, a BAT potentially contains recommendations of substitution. The 2001 Bref for chlor alkali production defines on the one hand membrane technology as the BAT for chlorine production, and on the other hand, specifies a set of BAT for the mercury technology when it is still in use although it is about to be phased out. These documents provide tools and references to make progress, but they do not give any indication to guide the choice between the first and the second level of BAT. They leave the implementation time table open. Moreover the use of BAT in individual cases, i.e. on the site of plants, takes account of the economic feasibility, of the format of the facility and a series of criteria which are locally dependent. The implementation of BAT gives room to negotiation at national or local level.

One trend supported by environmental protection NGOs considers that to meet the goals of the Convention and the more ambitious objectives of the Sintra strategy on hazardous substances, it is requested first to question the relevance of the uses of chemicals that have a potential impact on the sea. This is consistent with the emphasis put on the precautionary principle in the Convention. The opposed perspective taken by the industry is that OSPAR should focus its resources on well-founded actions, in order to make sure that the decisions target at the most relevant emissions sources to reduce pollution, and that the actions are proportionate to the potential harm. They are prone to make as much scientifically-based decisions as possible, based on risk assessment. They are supported in this view by the BAT principle. This schematic delineation does not strictly apply to Contracting parties which may take a different stand according to the issues. It reflects however the duality of the Convention dynamics. In this respect the nature of the work on a given substance is a clear indication of the issues at stake. Technical decisions and definitions of BATs are made at the level of working groups. Substitution decisions or the like are rather taken at ministerial level.

Radioactive substances

Concerning the radioactive substances, two main technical questions are raised : what do “historic levels” and “close to zero” in the 2020 objectives mean? In order to reach this goal, how to assess progress made in reducing radioactive discharges, the impact on

marine environment (concentration) and the impact on man (dose) ? The first question is discussed at the Radioactive Substances Committee (RSC), the second in three working groups composed by national experts.

The issues at stake at the technical level are discussed in the OSPAR Commission. The political objectives are then previously translated into technical issues to be transmitted to the experts. Positions adopted result from compromise and negotiations between the actors attending the meetings (Contracting Parties and observers). The interpretation of experts is not only based on technical competence but it also reflects the political strategies led by each participant. So experts can have an active role on political decisions by turning the discussions into one option or the other. For example, talking about “zero discharges” has not got the same consequences as talking about “zero impact” on man.

4. THE STAKEHOLDERS INVOLVEMENT PROCESS : INFLUENCE OF STAKEHOLDERS’ WATCHFULNESS ON TRUST AND CONFIDENCE

OSPAR decision-making process is characterized by the integration of technical and political arguments. Nonetheless there is important assessment work achieved within OSPAR to estimate and follow the quality of the marine environment, the releases of the various substances, and the review of the efforts made by each contracting party.

Hazardous substances

The information on hazardous substances is scattered and is provided in different formats according to each national practices. Data are given by national authorities and when possible by the industry. Gathering, harmonizing and updating data is an important function of the Convention.

There are opportunities for stakeholders, both the industry and the environmental protection NGOs, to provide additional data, to comment and argue on available ones. This gives credit to the quality of the assessment and is a guarantee that to some extent difficult points in assessment are addressed.

The participation of stakeholders in the DYNAMEC process where hazardous substances are assessed and prioritized also strengthens the integration of various viewpoints in the selection of substances. It is possible that the dialogue between contracting parties and stakeholders makes more transparent the way this selection process meets the overall goal of OSPAR, i.e. the protection of the marine environment. The criteria and the choice between substances should actually always be considered from this perspective.

Contracting parties make a regular review of the measures they take to implement OSPAR decisions. This is the duty of the official national representatives. Industry representatives who attend as observers OSPAR meetings may also complement this information to show how they abide by OSPAR decisions through the objectives set by

their national authorities. Conversely, environmental protection NGOs can ask questions to contracting parties to make sure that the efforts they make are consistent with their commitment and equally with the more global OSPAR strategies and goals.

These various elements outline that the assessment and review of the protection of marine environment is made in dialogue with stakeholders and is not a matter for sole technical experts. There is input both from the industry and the environmental protection NGOs to enhance the relevance of OSPAR activities towards its primary goals. This may result in a more trustworthy governance process. This is the reason why both the industry and the “green” NGOs express satisfaction with OSPAR. Their views are listened to, and the principles set out in the Convention (precautionary principle and BAT) give them a basis to influence the actions taken. However most issues are not associated with local concerns around chemical sites. OSPAR decisions and work don’t seem to be visible to the wider public.

Radioactive substances

As noticed by the various stakeholders we met, the OSPAR Convention is mainly seen as a political process, where the Contracting parties commit themselves towards the progressive implementation of the Strategy.

The preparation of the national plan for France was made by the DGEMP with the technical support of IRSN. Moreover, the DGSNR took part to the validation of the document. However, no consultation of the NGO's was made for the elaboration of the national plan. The representative of a local NGO around the COGEMA-La Hague plant regrets that the debate is not open to other participants than the operators and the administration, and that the local actors do not have a role to play in the elaboration of the national plan or in the determination of the technical aspects of the strategy (baselines, radionuclides to be selected , definition of environmental quality criteria,…).

The Greenpeace NGO, participating as observer to the OSPAR Commission, notes that it is important for them to be able to provide their opinion as they act as a pressure group aiming at enlarging the scope of the debate and raising some issues. Even if they do not sign the decisions, they can have an influence if some contracting parties adopt their points of view.

5. THE FACTORS INTEGRATED INTO THE DECISION FRAMING AND DECISION TAKING PROCESSES

As explained above, OSPAR decision-making process includes technical and political arguments. Depending on the issue, the precautionary principle will be put forward, or the approach will be more focussed on technical considerations and will rely on the development of a BAT.

The most original feature of this process is that it is an intergovernmental arena. By signing the Convention each contracting party has agreed to strive towards the protection of the marine environment. The relevance of any OSPAR decision is

considered against this general goal. Although one country may have good reasons not to implement a decision (for instance, employment and economic development considerations), it will not like to appear as the country which resists the progress in marine environment protection. For that reason there is interest for all members to build as far as possible a common position before reaching a decision. This negotiation process allows contracting parties to look for a centre of gravity between their respective positions. This search includes consideration of economic and social factors but remains oriented towards the protection of marine environment. The loose implementation rules also make it easier to reach ambitious decisions.

Hazardous substances

In the case of mercury cell technology, the phase out recommendation was taken on the basis of the very hazardous nature of mercury. This was not contested. However the social and economic issues were progressively raised as soon as implementation started. The recommendation set a time limit, but gave no indication on the phasing out process. The only indication was that the new limits set by the 90/3 decisions were not binding for facilities that would convert to a mercury free technology by 2000. The industry made the reverse consideration : it reduced releases well below the new limits and considered that this would be an argument to let the facilities run until their natural end of life. This argument was presented with the demonstration that pollution would be less in this case than if no further investment were made in the plants.

In 1990 OSPAR contracting parties commonly agreed that the use of the mercury cell technology was no longer justified and accordingly set an ambitious goal to phase out the production of chlorine with this technology. The implementation at national level raised domestic concerns. At European level the industry under Eurochlor tried to influence a revision of OSPAR recommendation. Progressively a series of questions were raised which were not considered in the initial phase-out recommendation. The emergence of these issues did not however challenge the recommendation and the consideration that mercury cell technology was not justified. Nonetheless they were important in the phase of implementation : what to do with the mercury waste from decommissioned plants ? how to consider the binding nature of the recommendation when a plant adopts the latest BAT and is expected to add a trivial mercury pollution for a limited number of years after the 2010 deadline ? doesn’t the divergence of interpretation between contracting parties about the binding nature of the recommendation create a situation of unfair competition between national industries ? These questions but the first are not necessarily relevant from the perspective of the 1990 decision, but they needed to be addressed. OSPAR provided an arena for these issues to be raised, discussed and negotiated. They were not solved within OSPAR, but their discussion in OSPAR enabled contracting parties and the industry to make decisions to progress in their solving.

Radioactive substances

With regard to radioactive substances, the current question for applying the Sintra strategy refers to the definition of reference criteria able to address the question of the quality of the environment.

The first debate deals with the potential impact of radioactive substances on ecosystems and the environment. Until now, ICRP admitted that protecting human, implied protecting the environment. There is no more a consensus on this topic, even at ICRP, and researches are currently underdevelopment in order to study the potential effects on ecosystems of accumulation of radioactive substances and to establish models for the evolution of the environment. First information is provided but there is still scientific work to be performed. Furthermore, it appears that the scientific researches allow to explain part of the process of transfer into the environment, but is not in position to solve the question of the quality of the environment. Unfortunately, as it was pointed out by different stakeholders (notably NGOs), there is in this perspective a lack of political and social debate in order to set up the expectation in terms of quality of the environment, based on the current scientific knowledge as well as the social, environmental and economic concerns of the stakeholders. The absence of debate on this issue leaves the "door open" for various interpretations (purely scientific, "absolutist", "complexification" of the issue…) without allowing to go towards a consensus and common values.

Therefore, in practice, the first developments for defining the criteria rely on the selection of "traditional" but "operational" indicators: discharges, environment concentration and doses. The debate is thus focused on the choice of the indicator: some wish to reduce close to zero the discharges while others prefer to deals with the evaluation of doses. Behind this technical issue, different interests are confronted, without a real debate on the main issue at stake: the quality of the environment and its evolution.

APPENDIX G1.
MERCURY LOSSES FROM CHLOR ALKALI INDUSTRY : HISTORY

1990	OSPAR Decision 90/3 "recommends that existing mercury cell chlor-alkali plants be phased out as soon as practicable. The objective is that they should be phased out completely by 2010"
1991	*French regulation — Arrêté* and *Circulaire* as of 21 november 1991 introducing decision 90/3 requirements into French Law
1996	*EU regulation* — IPPC Directive
1998	OSPAR Strategy on Hazardous Substances
1998	*French regulation* — Arrêté 2 february 1998 on releases in water from industrial facilities
1999	OSPAR Workshop on Chlor Alkali
2000	OSPAR decision not to review 90/3 decision
2000	*French regulation* — Circulaire 7 March 2000 on impact assessment for mercury cell units
2001	Reference Document on Best Available Techniques in the Chlor-Alkali Manufacturing industry, December 2001
2010	OSPAR deadline for the implementation of the 90/3 recommendation
2020	OSPAR deadline for the implementation of the 1998 Hazardous Substances strategy

APPENDIX G2.
OSPAR WORKSHOP ON THE CHLOR-ALKALI INDUSTRY
SEPTEMBER 1999

ANNEX 1

OSPAR CONVENTION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH-EAST ATLANTIC

OSPAR WORKSHOP ON THE CHLOR-ALKALI INDUSTRY (WOCAI)

MADRID: 27 – 29 SEPTEMBER 1999

Voluntary Commitments by each Western European Chlor-Alkali Producer (Mercury cells)[103]

Commitment 1:

No increase in mercury chlor-alkali production capacity

The companies re-state the commitment made in 1995 not to install mercury cells for any incremental chlor-alkali production capacity.

Commitment 2:

Mercury cells will not be shipped to third parties

The companies commit themselves not to sell or transfer mercury cells after plant shutdown to any third party for re-use.

Commitment 3:

Mercury Emission Reduction Programme

The companies commit themselves to the continuing reduction of mercury emissions beyond the PARCOM Decision 90/3 standard of 2 g Hg/t Cl_2 capacity for emissions to the atmosphere.

Any environmental impact of future atmospheric mercury emissions from the chlor-alkali industry depends on the total environmental burden of mercury during the remaining life time of the plants. Therefore, the West European mercury process chlor-

[103] For the production of chlorine, alkalihydroxides and hydrogen.

alkali producers will express their emission reduction commitment as a timetable of staged emission reductions. Specifically, the companies commit to:

i. achieving an annual weighted average level of mercury emissions to air, water and in products not exceeding 1,0 g Hg/t Cl_2 capacity by end 2007; and
ii. working towards a target weighted average level of mercury emissions to air, water and in products not exceeding 0,7 g Hg/t Cl_2 capacity by 2010; and
iii. pursuing their efforts to further reduce their emissions beyond that date,

on condition that the plants concerned are allowed to operate beyond the year 2010. Some plants, for reasons such as design, age and geography, may not be able to achieve the above figures, while others will achieve even lower emission levels. Therefore, in addition to the stated targets for weighted average emission limits, the companies make a further commitment that no individual plant will exceed a level of mercury emissions to air, water and in products of 1,5 g Hg/t Cl_2 capacity by end 2007.

In order to reflect any further progress in emission abatement techniques, the companies will review these commitments no later than end 2007 with a view to achieving still lower emissions where practicable.

Commitment 4:

Reporting of individual plant mercury emissions data

Euro Chlor members with chlor-alkali production plants using mercury technology agree to disclose their individual plant mercury emission data in conformity with the OSPAR reporting guidelines. In other words no objection will be made because of the confidential nature of this data. The data will be open to audit by the competent national authorities through a designated independent third party.

Commitment 5:

End of existing mercury plants

The mercury cell producers commit to closing or converting their mercury cell chlor-alkali plants to non-mercury processes when the plants reach the end of their economic lives. The timing of conversion or shutdown of existing chlor-alkali plants using the mercury technology will to a large extent depend on factors such as the environmental performance of the plant and its age, state of its equipment and economic attractiveness of its relevant market and downstream product mix. On the basis of a study by an independent external consultant, Euro Chlor expects that the phase-out of mercury cells in West Europe is likely to be completed by 2030 at the latest.

Commitment 6:

Safe disposal of metallic mercury from shutdown cells

The companies are determined to use best environmental practices and best available techniques to appropriately handle the transport, storage and disposal of metallic

mercury that arises after shutdown of the cells with the aim to avoid emissions and spillage into the environment.

Large quantities of pure mercury (some 12 000 tonnes) will become available as a result of the closure or conversion of the mercury cellrooms. Recognising that the pure mercury from cellrooms is best used in a manner that minimises the need for adding mercury to the global circulation by mining and extracting virgin mercury, the companies therefore agree:

i. to source so far as possible their future requirements for mercury for the operation of existing cellrooms from the pure mercury arising from cellroom closures and conversions. The result will be that members' net purchases of virgin mercury from external sources will be minimised, and probably zero.
ii. to regard as the most-favoured option the return of all pure mercury not required within the industry to an established mercury producer so as to displace new production of the equivalent quantity of virgin mercury. The feasibility of this most environmentally favoured solution will of course depend critically on the time-span over which the plants are converted or closed.

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1 September, 1999

List of Signatures of Western European Companies (Mercury cells)

Akzo Nobel Base Chemicals BV
Albemarle SA
Aragonesas Industrias y Energia SA
Ausimont/Montedison SpA
BASF AG
Bayer AG
Elektro-Chemie Ibbenbüren GmbH
Electroquimica De Hernani SA
Elf Atochem SA
EniChem SpA
Erkimia SA
Hays Chemicals Ltd
Hellenic Petroleum SA
Hüls/Vestolit GmbH
ICI Chemicals & Polymers Ltd
Industrie Chimiche Caffaro SpA
LII Europe SARL
Norsk Hydro ASA
Produit Chimiques d'Harbonnières
Quimica del Cinca SA
Rhodia Ltd
Solvay SA
Säurefabrik Schweizerhall
Tessenderlo Chemie SA
Uniteca SA
Vinnolit Monomer GmbH
Vintron GmbH

H. THE ABANDONMENT OF THE BRENT SPAR OFFSHORE INSTALLATION

1. BACKGROUND AND CONTEXT

1.1. Historical context

The UK Continental Shelf (UKCS) has been the scene of hydrocarbon exploration and production since the mid 1960s, first in the shallow waters of the southern North Sea, then through the progressively deeper waters of the central and northern North Sea and finally in deep water off the northwest Atlantic coast. Over that period, a significant number of offshore installations associated with the industry have been put in place. The precise number varies depending on the source consulted, due to differing definitions of what constitutes an installation, but it is reasonable to suggest that there are somewhere in the region of 250 structures. As the UKCS has matured as an oil and gas province, the focus of industry, government and other interested parties has shifted gradually from questions related to the most appropriate way to develop the resources to the question of what will be done with these installations when the hydrocarbon reserves they are associated with are exhausted.

One of the first installations to be decommissioned on the UKCS was the Brent Spar. Construction of the installation had begun in 1975 and it had been commissioned in 1976. In many respects, this was a unique structure in that it was neither a rig nor a platform, but rather a floating oil storage buoy. It was intended as a temporary storage and tanker loading facility for the Brent field in the northern North Sea—owned jointly by Shell and Esso, and operated by Shell—until such time as a pipeline could be built. It was finally declared redundant in 1991. Seen from the surface, the 14,500 tonne installation looked relatively innocuous. With a total height of over 140m, however, the bulk of the structure lay beneath the surface and was composed of six huge storage tanks with a capacity of some 50,000 tonnes of oil and a displacement of some 66,500 tonnes.

Disposal options for the Brent Spar could be divided into two broad groups. The first would involve its removal and dumping in deep water, the second, its removal and dismantling ashore. While the structure had been assembled practically in its entirety onshore then floated out to its location in the North Sea, a number of factors made the simple reversal of this process difficult. While the structure was stable where it stood, degradation of the tanks over time coupled with damage to two during operations meant that any attempt to refloat it or to rotate it to a towing position risked buckling or even rupturing the tanks. These were the practical issues facing the operators as they began the process of determining how the Brent Spar would be disposed of.

1.2. Political and Legal Contexts

1.2.1. Legal context

Irrespective of the practical problems, the operators also had to comply with legal requirements relating to the abandonment of offshore installations. In this regard, both international law and UK law were of relevance. The initial position in international law, contained in the 1958 Convention on the Continental Shelf, was that all offshore installations had to be removed entirely once they had reached the end of their useful lives.[104] In due course, however, the technical and cost implications of this approach became apparent—not least as the industry began to plan and develop some of the most challenging projects it had taken on in the northern North Sea. Thus, the 1982 Conference on the Law of the Sea saw agreement on certain exceptions to this general rule provided that navigational, fishing and environmental requirements were met—the net effect of which were that parts of some installations could be left in place.[105] In 1989, the International Maritime Organisation issued guidelines in this regard.[106] Relating more specifically to the North Sea, the OSPAR Convention also adopted an approach involving a general prohibition on sea dumping, but made exceptions for the disposal of offshore installations and pipelines.[107]

As regards UK law, the relevant provisions at the time were contained in the Petroleum Act 1987, which stated that an operator must obtain approval from the Department of Trade and Industry (DTI) for the disposal of an offshore installation.[108] The licence would be granted assuming the acceptance of the Abandonment Plan prepared by the operator. This Plan had to be proportionate, cost-effective and consistent with both international obligations and the precautionary principle. In addition, the Plan had to constitute the Best Practicable Environmental Option (BPEO). This latter was a concept proposed by the UK Royal Commission on Environmental Pollution in 1988.[109] Demonstrating that an option constituted the BPEO involved a number of factors including: ensuring that alternatives were sought to identify as complete a set as possible; specifying the origins of data used and their reliability; presenting scientific evidence objectively in order to assist the taking of decisions with social or political significance; and not regarding financial considerations as overriding.

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[104] Art. 5(5).

[105] UN Convention on the Law of the Sea (UNCLOS), Art. 80(3).

[106] UN International Maritime Organisation Guidelines for the Removal of Offshore Installations 1989.

[107] Annex III, Prevention and Elimination of Pollution and Elimination of Pollution from Offshore Structures, Art. 5.

[108] Where the operator proposed to dispose of an installation at sea away from the original site, there was also a requirement for licences to be obtained under the Food and Environmental Protection Act 1985.

[109] Twelfth Report of the Royal Commission on Environmental Pollution, *Best Practicable Environmental Option*, (Cm. 310, 1988).

Discussions between Shell and the DTI began in 1992, with some thirteen disposal options initially being considered. Of these, six were regarded as viable, with two finally being considered in detail: deepwater disposal and horizontal dismantling. Between 1992 and 1994, different aspects of these two options were examined until documentation was submitted to the DTI proposing deepwater disposal at one of three sites identified by the Scottish Office Agriculture, Fisheries and Environment Department (SOAEFD)[110] as the BPEO. During the same period, surveys of those sites had been commissioned by Shell and SOAEFD. In May 1995, Shell was granted a licence to dispose of the Brent Spar at the North Feni Ridge in the North Atlantic.[111] The deepwater disposal option was chosen over the horizontal dismantling on the basis that it involved significantly lower risks to personnel (by a factor of six), was cheaper (by a factor of four) and would have only a minimal environmental impact.

1.2.2. Political context

The fact that such a comprehensive regulatory regime had been put in place in the UK regarding the abandonment of offshore installations meant that the UK government viewed itself as being in the vanguard in this respect and was entirely confident about the adequacy of the arrangements. As far as it was concerned, any decisions to be taken in this area would be based on sound science and take account of the full range of significant factors. This meant that the industry would not be able simply to opt for the cheapest option (although, given that up to 50 per cent of decommissioning costs can be offset against tax, the government was by no means indifferent to the industry's concerns about the costs of abandoning the installations on the UKCS), but would also have to consider, for example, the effect on the environment and the risks to personnel involved in the physical process of removal. In short, the degree of confidence felt by the government in its position in this regard could not really have been higher.

1.3. Industrial and environmental aspects

1.3.1. Industrial aspects

For the industry, a key factor in determining what to do when the decision has been taken to abandon an installation has been the cost involved in any given decommissioning plan. It is safe to say that when the first generation structures were designed and built, while relatively detailed projections of costs and returns were calculated associated with the production profile of a reserve, perhaps even over a 25-year period, the costs of decommissioning and abandonment were not considered.[112] As

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[110] The North Feni Ridge, the Rockall Trough and the Maury Channel, all located in the North Atlantic.

[111] A report commissioned by the DTI from the National Environmental Research Council concluded in April 1996 that, '[w]hilst not necessarily unsuitable, it is unlikely that the site was the most suitable which could be found within the criteria used'. p12.

[112] For a view of field project calculations at this time, see Ferdinand E. Banks, *The Political Economy of Oil*, Lexington, Mass. and Toronto: Lexington Books, D. C. Heath & Co., 1980, p. 52.

time went on, however, this factor began to loom larger in industry thinking.[113] Nowhere was this awareness greater than on the UKCS. Although this province is home to no more than 10 per cent of the worldwide total of offshore installations, the proportion of very large and massive structures in deep water means that as much as 50 per cent of the worldwide cost of decommissioning will be expended here. In this context, the industry view, as expressed through representative organisations such as UKOOA and the E&P Forum, is that it is preferable where appropriate, for example, to leave part of large structures in place and to dump structures in deep water than to remove all redundant structures in their entirety to shore for scrapping. In short, the industry is keen on a case-by-case approach, which allows the individual complications of each structure to be taken into account as well as the risks posed by any decommissioning plan.

1.3.2. Environmental Aspects

From an environmental perspective, the decommissioning of large production platforms will pose some significant challenges—not least the question of what to do about the drill cuttings on the seabed associated with their operations perhaps over many years. This issue is currently the focus of a stakeholder dialogue process as well as discussion at OSPAR level.[114] On one view, the platforms themselves, being essentially inert steel or concrete structures, pose no such significant environmental threat in the sense of contamination should they be left in place or dumped in deep water. Another view is that metal structures would result in contamination as they decompose, while contamination in associated pipework, including low-level radioactive scale, would not be insignificant. The Brent Spar, being a storage facility, thus raised questions of metal contamination as well as contamination from whatever remained in its tanks and pipework. In this latter regard, Shell acknowledged that contaminated water remained in the structure, as did a small amount of oil. The effects of these contaminants on the seabed and the ocean as a whole, should the structure be dumped in deep water, were therefore factors to be considered in reaching a decision about the BPEO. While this matter had been considered to the satisfaction of the DTI during the regulatory process, not all interested parties agreed with the conclusions. In particular, the environmental NGO, Greenpeace, took the view that the dumping of such a vast structure was unacceptable in all circumstances and set a dangerous precedent. In addition, it believed, following a suggestion from an ex-oil worker, that the inventory of toxic substances on the installation could be much more significant than had been admitted by Shell. Following up this suggestion, it took a sample during its occupation of the Brent Spar and concluded that perhaps as much as 5,000 tonnes of oil remained on board, in contrast to the nominal amount claimed by Shell.

News that the Brent Spar was to be dumped had not produced much reaction in the media, whether in the UK or further afield. Nor had notification of the decision to the

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[113] See, for example, P.H. Prasthofer, ‘Decommissioning Technology Challenges’, *Offshore Technology Conference*, III, 1998, 379-396.

[114] For the current situation, see ‘Ministerial Meeting of the OSPAR Commission, Bremen Statement, 25 June 2003, paras 25-27.

OSPAR Contracting Parties led to any objection to the plan being made to the UK government by its counterparts. Reports of the Greenpeace occupation of the installation, however, and especially the dramatic footage shot as activists boarded it, changed all of this. In a short space of time, the disposal of the Brent Spar, from being a peripheral issue of technical interest only to regulators and industry, had become a major international issue touching the whole question of the attitudes of government and industry to ocean dumping specifically and environmental protection in general. Suddenly, the issue was headline news across Europe and Shell became the target of public protest, ranging from a boycott of its products to the firebombing of its petrol stations in Germany. Meanwhile, the UK government came under sustained pressure from its European partners, including previously quiescent OSPAR partners, to reverse the decision to allow deepwater disposal.

The government's response was extremely robust, defending the regulators decision on the basis that a rigorous process had identified deepwater disposal as the BPEO. This tough stance was continued even as the issue came to dominate relations with its European partners, most notably at the G7 summit in June 1995. Shell, on the other hand, wavered in the face of the dramatic effects on its business across Europe and finally announced, even as the UK's Prime Minister reiterated the government's stance, that it was abandoning the deepwater disposal plan. Shortly afterwards, Norway granted Shell permission to moor the installation in the Erfjord while it was decided what should happen next.

2. DESCRIPTION OF THE RISK GOVERNANCE PROCESS

2.1. Presentation of the risk governance process

It was at this point that the innovative approach that is the focus of this case study began to emerge. Faced with such a serious problem, which had seen Shell experience a severe rift with consumers and also with the government that regulated its activities on the UKCS, the company was very much in uncharted territory and it was by no means clear where it should turn next. Its first move was to commission Det Norske Veritas (DNV), an independent, not for profit, foundation with an established reputation, to carry out an audit of the contents of the Brent Spar with the hope of resolving the conflict between its figures and those put forward by Greenpeace. In the event, Greenpeace admitted errors in its sampling process even before the publication of DNV's report, which supported Shell's assessment.

Shell also announced a new 'Way Forward', placing a notice in the Official Journal seeking expressions of interest from contractors regarding the disposal of the Brent Spar. These submissions together with some 200 other proposals that Shell had received were to be developed into a 'long list' and the organisations involved then invited to meet pre-qualification criteria. In due course a list of 21 contractors was published and those involved given a month to develop an outline of their disposal plans.

At this point, Shell also announced that there would be a Stakeholder Dialogue Process with a view to assisting the identification of the ultimate solution. This process grew out

of Shell's earlier approach to the Environment Council (an independent charitable organisation that brings together stakeholders from all sectors to develop solutions to environmental problems) where it had begun to discuss options for the way forward as regards reaching a new disposal decision. In this regard, it should also be noted that the report commissioned by the DTI from the National Environmental Research Council concluded in April 1996 that, 'some means should be sought to take public acceptability into account in evaluating future marine environment impact assessments'.[115] The Environment Council first proposed a process by which a Europe-wide panel of 50 to 60 stakeholders would be established with a view to it being consulted throughout the technical process of developing a new disposal plan as a means of testing ideas and keeping in touch with the various interested constituencies. While Shell was agreeable to this proposal, the response from the UK government was negative. Shell and the Environment Council returned to the drawing board and developed a modified plan which the government accepted—albeit stressing that whatever disposal option was eventually chosen had to be at least as good as deepwater disposal on the basis that this was the BPEO.

The ultimate process developed by Shell and the Environment Council was not vastly different from the first proposal and it is probably not insignificant that in the interim between the UK government's initial rejection and ultimate acceptance the Energy Minister had left the government.

The first task in the new process was to discover who wanted to be involved and how. The Environment Council, on the basis of its independence, took on the task of contacting parties who were likely to be interested. This produced some 200 responses and it was then a matter of arriving at a balanced group of stakeholders who would be prepared to meet periodically, prior to the points at which key decisions about the disposal would have to be taken. The group consisted only of *participants* with no *observers*. In particular, the media were excluded, unless prepared to participate, on the basis that the behaviour of stakeholders was likely to be affected by their presence.

These meetings were facilitated by the Environment Council and it was made clear from the outset, firstly, that the deepwater disposal option had to be considered, as this was what the regulators had decided was the BPEO, and, secondly, that the aim of the exercise was not to reach a consensus but rather to ensure that whatever decision was eventually reached emerged from an open and transparent process.

As regards the broader transparency of the ongoing process, a key task was to ensure that there was easy access to information about it. This involved the setting up of a website, producing newsletters and CD-ROMs, and holding press briefings.

The process itself began with the facilitator attempting to draw out from the participants what their concerns were with the various options on the table with a view to informing the engineering process.

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[115] NERC Report, note 8 above.

By the time that the first meeting was held in London, on 1 November 1996, the 21 pre-qualified contractors on the so-called Long List, had produced a range of some 30 disposal options and these were discussed at the meeting. As a result of that initial Stakeholder Dialogue, the list was reduced to six contractors and 11 disposal options by mid-January 1997, with those contractors then being given four months to develop detailed commercial projects. DNV was once again retained to provide an independent evaluation of the projects on technical, environmental and safety grounds.

Over the next few months, Stakeholder Dialogue meetings were held in Denmark and the Netherlands and in June the six short-listed contractors presented nine detailed proposals. In order to assist stakeholders, a CD-ROM was produced with details of all the proposals including computer animations, interactive maps and video sequences. Then, in the autumn of 1997, the contractors' prices together with the findings of DNV's evaluations were published and further Dialogue meetings were held in the UK, Denmark, the Netherlands and Germany. On the basis of these interactions the choice was narrowed down to the original deepwater disposal option and a plan to re-use the Brent Spar in the construction of a quay extension at Mekjarvik near Stavanger in Norway. A final BPEO assessment was conducted and Shell announced in January 1998 that it had chosen the re-use option.

This choice then had to be approved by the DTI, which approval was forthcoming in August 1998. The project was completed in July 1999.

The Stakeholder Dialogue process, dovetailing with the technical process, operated according to the BPEO approach. This meant that once the most technically feasible options had been identified, their environmental aspects were addressed first, then their safety considerations and finally their cost. The environmental evaluation covered such areas as energy balance, emissions to air, consumption of resources, waste disposal, containment, ecological effects, aesthetic impacts, local societal effects and the environmental management systems put in place by the contractors.

It is interesting to note that the stakeholders concluded that none of the options put forward would have a significant environmental impact, not even the original deep water disposal plan which had caused so much controversy. The issue was, therefore, how to choose among the options given that there were only very small differences between them in terms of environmental impact. Here the stakeholders in the dialogue process were able to agree criteria to be used in such circumstances. Firstly, projects with a *positive energy balance* were to be favoured, that is, those in which more energy was saved than consumed. Secondly, projects coming higher up the *waste hierarchy* would be favoured over those lower down. This hierarchy, which aims at the minimisation of waste, ranks options as follows:

1. re-use
2. recycling
3. disposal

Applying these criteria, the stakeholders favoured the quay extension proposal above others on the short list inasmuch as it had the best energy balance figure and would allow 80 per cent re-use.

Turning next to safety, the quay extension and deepwater disposal options had the lowest potential for loss of life or a major accident.

Finally, on cost, deepwater disposal was the lowest, with the quay extension coming next.

It is worth noting, however, that although the calculations of risk and cost allowed projects to be ranked according to the different criteria, the actual outcome for the quay extension fell short of expectations: it cost nearly twice as much as expected and failed to achieve a positive energy balance.

2.2. Participants and resources

The four key participants for the purposes of this case study were as follows: Shell, the DTI, Greenpeace and the Environment Council. Shell was very much the prime mover. Having taken the decision to abandon the regulatory route, it was incumbent upon it to come up with an alternative means of reaching a decision that would allow it to resolve its conflict with Greenpeace, its customers and the government. The scale of this task should not be underestimated. As far as Greenpeace was concerned, the fact that Shell had abandoned its original plan to dump the Brent Spar was a victory and the fact that it was then engaging in a more open and collective effort to find a solution was seen as vindication of its stance. The DTI, on the other hand, was initially far more sceptical. It still believed that the regulatory process had produced the BPEO based on sound science and consideration of all the relevant risks, including environmental and occupational. It, therefore, attended the dialogue process, but remained to be convinced about its efficacy. For the Environment Council, this process was a stern test of its skills as a facilitator of discussions between different stakeholders, as Greenpeace and Shell were practically not even on speaking terms at the outset. The other stakeholders who attended the various meetings were drawn from industry, politics, academia, NGOs, regulators. Research carried out by the Environment Council after the process revealed a very high degree of satisfaction on the part of those involved regarding the process and the outcome. Of more immediate interest for the current study is the attitude of the key players.

As regards resources, Shell was funding the entire exercise and had not placed any limit on the available budget. Participants at the various meetings were not, however, paid.

2.3. Issues at stake

The key question for the dialogue process was quite simply what to do with the Brent Spar installation if it was widely felt that the identified BPEO of deepwater disposal was not acceptable. In this regard, it was of great importance that the dialogue process ran alongside and interacted with the technical process.

2.4. Analysis by the stakeholders

2.4.1. Shell

Shell regards the whole Brent Spar incident as a key turning point in its history and as a painful but very useful learning experience. Speaking to staff, it is clear that the organisation before and after Brent Spar is seen to be a totally different entity in terms of how it understands its business and as a consequence how it understands its relations with other stakeholders.

When the question of decommissioning the Brent Spar first arose, the companies attitude to other stakeholders was very traditional: it recognised those with whom it had regulatory or contractual relationships and interacted with them on the basis of the terms of those legal relationships. Insofar as it had an external relations policy, this took the form of ensuring that the company kept out of the headlines and that nothing interfered with its performance of its core task of exploring for and producing hydrocarbons. In short, its attitude has been described as insular.

As a consequence, the decommissioning of the Brent Spar was seen as a purely technical issue, as representing an engineering challenge for which an engineering solution would have to be found. Insofar as Shell did look for outside views on its ultimate decisions on a solution, this was only as far as, first of all, academia in order to have its work peer reviewed, as it were, and then the regulator.

That said, however, it has been admitted that when news of the deepwater disposal plan reached Shell personnel unconnected with the project, their initial reaction was that this was surely wrong. Once they had seen the rationale, however, they were reassured that the solution did indeed represent the BPEO. Unfortunately, as the company concedes, there was no sufficient consideration at that time of the likelihood of a similar initial response from the public and of the probable difficulty in persuading non-experts of the validity of the engineering rationale.

The ultimate breakdown of the initial project was exceedingly painful for the company. Staff remained convinced that they were doing the best that could be done and were uncomfortable with the idea that they might be forced to do something they regarded as second best, but they were confronting a hostile public and media reaction and accepted that their plan simply did not have wider support. They also had to deal with the fact that colleagues in other countries were feeling the effects of a decision that had been thought to be of interest only on the UKCS. Again, the company concedes that it failed to recognise the potential wider impact of the issue.

At this point, the company felt that it had lost control of the debate, along with the trust of its stakeholders. People, it felt, simply trusted Greenpeace and did not trust either Shell or the government. In these circumstances, notwithstanding its own certainty about the validity of the deepwater disposal plan, and notwithstanding the regulators' and the government's insistence that it go ahead with the licensed plan, it decided to start again and to open up the decision process.

Having engaged first DNV and then the Environment Council, Shell began to feel that it was regaining some control and beginning to build the confidence of its stakeholders. Although entering on the process with trepidation and fearing confrontation, the company felt that once stakeholders had a chance to consider all the issues it was possible that the original plan would be accepted. Alternatively, it was open to the possibility that new ideas would emerge—albeit that it was constrained by the regulators' insistence that any alternative must be as good as the approved BPEO.

The company's view of the process is extremely positive. None of the feared confrontation materialised—such disputes as arose being between other stakeholders rather than with Shell. It observed that when its technical results were verified by DNV, other stakeholders thereafter simply deferred to Shell on these matters, satisfied that it had the relevant expertise on engineering and other technical matters. This was a very striking finding for the company and stood in stark contrast to the public's attitude to its technical assertions during the regulatory process.

At the meetings, small group sessions were also used to allow stakeholders to consider and work through the problems facing Shell as it considered how to dispose of the Brent Spar. These allowed people to understand the constraints under which the company had to operate and thus to see what could and could not be done, irrespective of their preferences. DNV and the relevant contractors were also present at the meetings so that the stakeholders could ask questions and seek their advice.

Whereas the initial meeting at the QE2 conference centre in London was very formal, the remaining three London meetings and the five conducted in continental Europe (two each in the Netherlands and Denmark and one in Germany) were held in more informal surroundings and conducted on a much more informal basis. This latter approach was found to be more conducive to a productive meeting. Shell found that people were not impressed by formality, the company realising that this could give the impression of a public relations exercise which is what they were precisely concerned to avoid.

As regards the impact of the Dialogue on the technical process, it was found that solutions that the engineers regarded as technically feasible and environmentally sound, might be seen as unacceptable by other stakeholders applying other criteria, related to their own environmental and social perceptions. For example, an option involving the burial of the installation in a dredged trench was seen by the engineers as worth pursuing further, but was rejected by the stakeholders in the Dialogue process.

Shell was impressed by the way that the Dialogue process did not proceed simply by way of reaching decisions on the basis of a show of hands, but on the basis of a thorough examination of the stakeholders' reasons for accepting or rejecting a proposal. This allowed technical arguments to be considered on their merits, even if these were just as likely to be viewed by the stakeholders as not overriding other criteria.

A key concern for Shell was that the process would result in delay. While cost in itself was not an issue, the commitment of time by senior personnel was. In the event, Shell proposed a timetable for the various phases of the process, indicating when decisions would have to be reached on narrowing down the options. It was concerned about how

people would react to this, but in fact the schedule was simply accepted by the various stakeholders. Shell realised that once it was clear that a decision would *have* to be reached on a disposal option, all stakeholders, whatever their initial position, had an interest in a conclusion being reached and delay being avoided.

As mentioned previously, the Brent Spar incident and the Stakeholder Dialogue process are seen by Shell as turning points with the organisation emerging afterwards being qualitatively different from that which existed before. Among the lessons learned and the new approaches instituted are the following:

- Whereas previously Shell had a Press Relations department that was independent from the other parts of the company's business, external relations are now seen as an integral part of everything that the company does. This is one result of the appointment of a Reputation Manager in 1996 with the brief to ensure that the company did not encounter such problems in the future. Shell moved to a position where it understood that its reputation is an asset and thus requires to be managed just as much as its physical and financial assets.

- Openness is now the default position and the company seeks to manage issues with an external aspect proactively rather than waiting to see if anything happens and then reacting.

- The company now seeks to manage opportunities, for example, through ensuring its senior management have a higher public profile and present a human face for the company rather than it being perceived as a corporate monolith.

- More fundamentally, there is now an active programme of relationships management. Here the company asks itself who it needs to be in dialogue with in order to ensure good external relationships. This involves it looking at its relationships at all levels from local communities affected by its most mundane activities right up to governments who are concerned with its strategic objectives. The aim is to build ongoing personal relationships between named personnel and key stakeholders or their representatives so that all concerned have a continuous 'feel' for what is going on. In this way, both the company and its stakeholders can avoid shocks caused, on the one hand, by the company's activities and, on the other, by external reactions to them. Problems are identified at an early stage and steps taken to resolve them in close cooperation with stakeholders. The company has found that this approach makes stakeholders both more willing to listen to the company's point of view and to offer help and vice versa.

- In terms of what sort of process is required in any given situation, the company is guided by what its stakeholders tell it once they have been contacted with initial information about a new project. It then seeks to customise the process according to the response, whether full-blown stakeholder dialogue or less extensive measures.

- The dramatic shift in the public attitude to Shell's credibility and technical expertise brought about by the intervention of DNV in the Brent Spar case mean that independent verification and accreditation of what the company is doing is now seen as vital as a means of ensuring that stakeholders have confidence in what the company is doing.

Independent facilitation provided by the Environment Council was vital in the Brent Spar case. It is not necessary in most cases now where Shell has good ongoing relationships with stakeholders, but would be vital in any case where there were entrenched positions.

2.4.2. DTI

At the time of the Brent Spar case, the UK Government was very concerned by Shell's decision to abandon the deepwater disposal plan. The DTI stood by its decision that deepwater disposal represented the BPEO. This was reinforced by the fact that although the media uncritically accepted Greenpeace data about residual oil in the installation the DTI knew this to be false as a result of flawed sampling techniques.

The DTI also took the view that this was essentially a domestic issue, involving the UKCS and UK territorial waters, and as such was a matter for the UK Government. This position is reinforced by the fact that even when the Greenpeace campaign was at its height, the UK government received only a handful of letters of protest from within the UK, but some 4,000 from continental Europe. Nevertheless, it is clear that the UK Government fulfilled its international obligations and notified its European partners in the Oslo and Paris Commission (OSPAR) of the decision. No objections or comments were received from OSPAR on the sea disposal plan.

It is also clear that when Shell subsequently came forward with revised proposals the DTI recognised that circumstances had changed and in due course was able to approve reuse of the installation in a Norwegian quayside development project. However, the DTI was initially reluctant to accept the need for a wide-ranging Stakeholder Dialogue process as proposed by Shell. Even when it was agreed that it could go ahead, it remained sceptical—and concerned by Shell's suggestion that it wanted to take everyone's opinion into account.

That said, however, the DTI readily concedes that once the process was underway it was converted to the idea and accepts that the process was extremely successful in resolving a problem that started with diametrically opposed positions being held by the main stakeholders. The key, they realised, was that the process is non-confrontational and does not see a dispute as a zero-sum game—all stakeholders may emerge from the process feeling that they have won.

There can be no more striking indication of the scale of this conversion than the fact that the DTI now uses stakeholder dialogue as a routine tool (for example, in Strategic Environmental Assessments). It is aware that online processes for engaging stakeholders are now being developed, but its view is that face-to-face interactions remain preferable because this is a vital component in building trust.

While Stakeholder Dialogue is not a statutory requirement in the case of the decommissioning of offshore installations, the DTI now takes the view that there often should be some variant of this process (for example, where there is a derogation from the requirement for complete removal or an unusual element in the decommissioning proposals) and will ask operators to carry this out where appropriate.

2.4.3. Environment Council[116]

The problem confronting Shell at the time that the Environment Council was brought in was very serious. The UK part of the company was under pressure from its customers and indeed from other parts of the corporation in other countries who were suffering as a result of the initial decision to dump the Brent Spar. The government meanwhile was so angry with Shell as a result of its subsequent decision to abandon the deepwater disposal plan that the company even feared that its future in the North Sea might be jeopardised.

The approach of the Environment Council was to sit down with senior personnel from Shell and to explore the problems they faced in detail. The first issue from the Council's perspective was to reduce the tension between the company and Greenpeace and to this end it facilitated some bilateral meetings between them. The aim of these was in the first instance to allow all concerned to 'let off steam'. Feelings were running so high, indeed, that it was regarded as a significant result in the first meeting that everyone was prepared to sit around the same table.

With this step once taken, it was then a question of working out a process by which the whole question of what to do with the Brent Spar could be re-examined in such a way that the ultimate decision would prove more widely acceptable. An initial proposal to bring together a group of 50 to 60 stakeholders on a regular basis to work alongside the technical process was rejected by the government. It remained very concerned that a decision that had emerged from a properly functioning regulatory process should be put aside and that the operator should be embarking on its own independent process. It is probably true to say, however, that individual personalities were a significant factor here and that the personal hostility of the Energy Minister towards Greenpeace contributed strongly to the government's attitude to the initial proposal. The fact that a very similar proposal was accepted after the Minister had resigned from the government tends to support this suggestion.

The process of meetings of stakeholders in different countries to dovetail with the technical process worked very well. The meetings in the UK, the Netherlands and Denmark were particularly successful, whereas the single meeting in Germany was much less so. At one level, Germany had seen the greatest initial reaction to the deepwater disposal plan and the greatest hostility towards Shell. Beyond that, however, there were problems associated with the working language. Whereas in the UK, the

[116] This section is based on an interview with the key facilitator involved in the process who was working freelance with the Environment Council at the time and who now works for another organisation. Information is also drawn from Environment Council publications.

Netherlands and Denmark English had been used successfully as the working language, a similar insistence on the use of English at the German meeting by the stakeholders and a rejection of the simultaneous translation facilities that were available was perceived to have caused problems because the nuances of the plenary discussions were not always appreciated. Finally, whereas at the other meetings proceedings had commenced with a presentation of the general themes to be discussed, this was resented at the German meeting because the stakeholders stated that they had read all of the background information that had been provided to them in advance. In short, it was clear that the cultural context of the German meeting had not been fully appreciated in advance.

The involvement of DNV is seen as a particularly good move. Whereas there had been a complete breakdown in confidence in the initial regulatory process—because no one believed that dumping the Brent Spar in deep water could really be the BPEO—and a consequent lack of trust in the main parties involved in that process—Shell and the DTI—DNV, because of its reputation and its not-for-profit status, were regarded by all stakeholders as credible and trustworthy. The fact that it was brought into the Stakeholder Dialogue process (as opposed to its earlier involvement in confirming the inventory of substances remaining in the Brent Spar) was also important, because none of the stakeholders felt that this body was being forced upon them—rather it was brought in with the consent of the stakeholders. The presence of DNV at all the subsequent meetings was, therefore, very important because people trusted it and what it said about technical matters. Shell and the DTI also saw its involvement as vital because it confirmed the company's and the regulators' original calculations and thus helped to restore people's trust in those bodies.

The first meeting looked at over 50 proposals for the disposal of the Brent Spar and gradually this number was whittled down by the stakeholders during the dialogue process until only deepwater disposal and the option to cut the installation into sections and use them as the basis for a quay development in Norway remained. This was the choice presented to Shell by the Stakeholder Dialogue process. By the end of the process, it is felt that most stakeholders knew and accepted that deepwater disposal was indeed the BPEO. That did not alter the fact, however, that it was simply not publicly acceptable. The stakeholders preferred an option that involved re-use as opposed to one that simply involved throwing the installation away.

There is a sense, therefore, in which the Brent Spar Stakeholder Dialogue could be said to have been unsuccessful inasmuch as the best environmental decision, as acknowledged by most, was not arrived at. It indicates, however, that other factors are also regarded as important by other stakeholders. The view of the main facilitator in the Stakeholder Dialogue is that the process is only as good as the outcome; it is never sufficient to say that the process was good irrespective of the outcome. This apparently pessimistic conclusion may, however, be leavened somewhat by the observation that ownership of the process by the stakeholders may be regarded as an outcome in itself.

A significant finding of the Brent Spar case for the facilitator was the important role played by key individuals. Initial resistance from the government, the eventually enthusiastic support of the DTI, the willingness of Shell to prioritise its relationship

with customers above its relationship with government—each of these crucial factors in the history of the process was dependent on the attitude of key individuals.

A further key finding was that the independence and experience of the facilitator are vital to the success of this sort of process. Independence from the main protagonists is necessary if the process is ever to get off the ground and allow trust to be built, while experience is vital if the process is not to break down at the first sign of conflict; in other words, skill and expertise are required to keep the process on track.

The facilitator involved in Brent Spar also believes that as significant as this case was in terms of being the first process of its type, the world has now changed to the extent that the exact model utilised is no longer sufficient. At the time, in the mid-1990s, it was sufficient once confidence had been lost in the regulatory process to engage with stakeholders in the form of NGOs, academics, industry, regulators, and so on. Now, however, questions are increasingly being asked about the mandate of these stakeholders. If it is no longer sufficient in many cases to trace the mandate of the regulators back through the periodic exercise of the franchise, it is equally problematical to rely on more extensive processes populated mainly by those with vested and perhaps narrow interests. The challenge now is to find ways of engaging more people without running into the problem of stakeholder fatigue, which is already apparent due to the proliferation of dialogue processes and a frequent failure by those organising them to achieve a better coordination and avoid a duplication of effort.

2.4.4. Greenpeace

In contrast to the view taken by the regulator and the operator with regard to the disposal of the Brent Spar—that this was a unique event which had no implications for the disposal of other installations in the North Sea—Greenpeace very much approached this case on the basis that it would set a precedent. The organisation also had profound doubts about the neutrality of the regulatory process held in such high regard by the DTI and by Shell. Whereas regulator and operator claimed that deepwater disposal had emerged from a process designed to discover the BPEO, Greenpeace believed that there was a predisposition towards a dumping option. It based this belief on information received privately from engineering firms that would have been involved in any onshore disposal of the Brent Spar. Although acknowledging the vested interest of these firms in avoiding deepwater disposal, Greenpeace stands by this information, which suggested that Shell had devoted significantly greater resources to consideration of the cheaper offshore disposal options than to the onshore options.

Beyond this, Greenpeace also had concerns about the adequacy of the BPEO process itself. Firstly, the NGO believed that it was inappropriate to have cost as a consideration in this process at all, even if it was ranked last after environmental and safety issues, not least because of the relative insignificance of the costs of decommissioning in the context of the lifetime profits derived from an oilfield. Secondly, Greenpeace had concerns about the way that quantitative risk assessment was being used by the regulator, apparently as a means of ruling out certain options (specifically onshore disposal) instead of as a means of identifying areas of greatest concern to which mitigating procedures could then be applied.

With regard to the Stakeholder Dialogue process itself, here too Greenpeace has a less enthusiastic view than that of the regulator or the operator. This is due less to the idea of the process than to its precise operation in this case. Greenpeace's observation is that there were marked differences in the meetings held in the different countries. Those in Denmark, the Netherlands, and especially Germany, were characterised by a much stronger pro-environment sentiment than those held in the UK. It is certainly true that for Denmark and for Germany the North Sea is their only sea and accordingly that these countries may have been much more concerned about the possibility of a dumping precedent being set. It may also be the case that these differences in approach simply reflect different societal attitudes towards the environment: in each of the continental European countries involved, for example, people have a much longer and more direct experience of recycling waste.

At the UK meetings, Greenpeace felt that Shell was much more in control of the process. This was not because it had in some sense usurped the role of the Environment Council, but rather because it was essentially among friends, or at least sympathisers. While on paper the mix of stakeholders at the UK meetings looks good, the suggestion is that the Environment Council may have been a little naïve in assuming that, for example, academics would act as neutrals or in some sense as a counterbalance to the operator and the industry more generally. It is pointed out in this regard that many of the academics involved were essentially pro-industry, relying to a great extent for funding on the oil industry.

Another concern that Greenpeace has about the Stakeholder Dialogue process is that a key constituency, the engineering firms who would have been involved in any future onshore disposals, was not represented. The suggestion is that, whatever the feelings of many in this group privately, they were unwilling to be seen to be taking sides publicly which could have put them at odds with the industry upon whom they relied for business.

As regards the remit of the Stakeholder Dialogue, while Greenpeace agreed to be involved at all stages, it was never content with the restriction placed on the process that only issues directly relating to Brent Spar could be considered. From its perspective, the case-by-case approach to the abandonment of offshore installations favoured by the industry (as exemplified also by the Brent Spar Stakeholder Dialogue) only served to mask the significance of the larger context. For example, this restriction meant that the energy balance test could produce perverse results from Greenpeace's perspective. As far as the organisation was concerned, it was perfectly acceptable to select an option with a negative energy balance if this short-term cost had the effect of sending a strong signal about the unacceptability of dumping and a general societal preference for recycling and re-using waste. Furthermore, if the oil industry was to use energetic costs of removing oil platforms as an argument for dumping them, then they should consider the wider impact of their core business in relation to CO_2 emissions and climate change.

If one were to attempt to characterise Greenpeace's view of the Stakeholder Dialogue, it would be that the process was understood very much in an 'engineering' way. In contrast, therefore, to the view especially of the operator that this was a social process dovetailing with an engineering process, Greenpeace takes the view that an engineering

perspective dominated, and that the ‘bigger picture’ argument on industrial responsibility and societal values were played down—or rather people did not understand how to address them.

Overall, however, Greenpeace is content with the change in attitude that the Brent Spar Stakeholder Dialogue has produced in both the regulator and the industry. Indeed, it is now asked to be involved in more such processes than it has the capacity for. This could pose a problem but for the fact that the organisation has confidence in the OSPAR process. In this regard, it particularly directs those operators who approach it in relation to abandonment plans to consult with engineers outside the UK (and especially in Germany) because it has found engineers there to be more willing to challenge the industry. This has the benefit for Greenpeace of increasing the probability that innovative solutions will be proposed, and for the industry of being able to demonstrate to OSPAR that whatever decommissioning plan they propose has been widely considered.

3. ANALYSIS

3.1. The guiding principles of the decision-making process

3.1.1. Rationale of the risk governance principles behind the decision-making process

As discussed above, the original regulatory process required the operator proposing to abandon an installation to produce a plan that was proportionate, cost-effective and consistent with both international obligations and the precautionary principle. In addition, the Plan had to constitute the Best Practicable Environmental Option (BPEO) which meant that that alternatives were sought to identify as complete a set as possible; that the origins of data used and its reliability were specified; that scientific evidence was presented objectively in order to assist the taking of decisions with social or political significance; and that financial considerations were not regarded as overriding. While the Stakeholder Dialogue process constituted a very dramatic abandonment of the regulatory process and a disregarding of a direct instruction from the regulator (and indeed the government), the influence of that original process continued to be felt. While the regulator had essentially been snubbed by the operator, the latter was by no means completely free to do as it pleased and could not allow the Stakeholder Dialogue process to produce just *any* decision about the disposal of the installation. Whatever decision was ultimately reached, it too would have to gain the approval of the regulator before it could be implemented and the regulator made it clear that it would not accept any plan that was less good than the already identified BPEO. The risk governance principles behind the new decision-making process were therefore in essence the same as those underlying the original regulatory process. What was different, however—and indeed significantly different—was the fact that whereas in the original process the public interest was supposed to be looked after by the regulator on the basis of its mandate, in the new process the public interest was to be ensured, firstly, by the involvement of a range of stakeholders who had expressed a direct interest in the case and a willingness to participate directly in the decision-making process over a period of time, and secondly, by the fact that at all stages of the process there was to be complete

openness and transparency with wide access to information about what was going on being a key feature. Equally, the dialogue process allowed the stakeholders to develop and agree the criteria upon which they could reach decisions about options which ultimately manifested fairly small environmental impacts: the energy balance test and the waste hierarchy.

3.1.2. The objectives of risk governance in the case

As discussed in the foregoing paragraph, the DTI as regulator concerned with the abandonment of offshore installations had to ensure that a range of risks were balanced in reaching a final decision. These included environmental risk, occupational risk and indeed economic risk. The appropriate balance of these risks would constitute the BPEO. The fact that confidence in this process was lost when Greenpeace alleged that the operator's and the regulator's data were wrong brought home the fact that governments and the industries they regulate can no longer rely on traditional models to ensure that decisions will be regarded as legitimate. The new process, therefore, in addition to balancing the range of risks had the added objective of allowing other stakeholders to see how decisions were reached and what constraints had to be contended with as well as allowing them to add in the other values and criteria that they regarded as important and which may not have been obvious to the operator and the regulator. The stakeholders thus followed the same BPEO approach, considering respectively the environmental, safety and cost implications of each technically feasible project, but deployed the energy balance test and the waste hierarchy to rank projects that otherwise offered similar environmental advantages.

3.1.3. Contribution to the improvement of the governance of hazardous activities

The Stakeholder Dialogue process served two important functions. First of all, it served to build trust between regulator and the operator on one hand and the other stakeholders on the other, inasmuch as by the end of the process all (or at least most) agreed that the deepwater disposal was indeed the BPEO. And secondly, it allowed the operator and the regulator to see that even a technically sound decision on disposal may not be socially acceptable and that stakeholders may be prepared to accept compromises on one dimension of environmental protection in order to gain advantages on another. The process therefore served to demonstrate that the governance of hazardous activities must indeed be carried out on the basis of sound science, but equally on the basis of what society is prepared to accept; and also that it is possible to achieve the integration of these demands. Potential blockages to the implementation of the new process include: a lack of leadership in key organisations (key players had to believe that the process should be embarked upon); dealing with the problems of cost and delay (in this case, the costs of not embarking on the process were seen to outweigh those of doing so; and all stakeholders had to agree that a timetable should be adhered to); concerns on the part of some stakeholders about the limitations placed on the process (the need to ensure that the process is not constrained in what it can consider but equally is not so broad that it is effectively being asked to perform a task more properly the preserve of a higher level).

3.2. The role of expertise

3.2.1 Identification of uncertainty

A great deal of uncertainty in this case arose because of the starkly different claims being made by Shell and the DTI, on one hand, and Greenpeace, on the other. This uncertainty essentially disappeared, however, when an independent organisation in whom all stakeholders had sufficient confidence (DNV) carried out its own assessment. Thereafter, it appears that uncertainty was not a major concern of the stakeholders. To a very great extent they were prepared to accept the technical data they were given, whether by Shell, the contractors or by DNV and then to use that data to identify the most acceptable option. The fact that the chosen option finally cost twice as much as expected and failed to achieve its promised positive energy balance serves as a reminder, however, that, in advance, all calculations must be regarded as provisional. Given the relative sophistication displayed by the stakeholders in the process and the fact that the BPEO approach was being used, it is probable that none actually regarded the figures as absolute but rather used the various assessments of environmental, safety and economic risk appropriately as a tool for ranking options.

3.2.2. Dissenting views

A key feature of the Stakeholder Dialogue process was specifically that consensus was not the objective, but rather acceptance of the process and, by extension, of the decision ultimately reached. The process very much allowed different views to be heard and worked through. It appears, however, that there was in fact a fairly large measure of agreement at each stage. This is perhaps due to the specific features of the case, principally that all the stakeholders involved had agreed on the need to reach a decision from among a clear set of options within a specified time, and that agreement was reached on criteria that could be used to rank options. Some concern has been voiced by Greenpeace that at points where it did disagree with a conclusion, the impression was nevertheless given that it was in agreement.

3.2.3. Distinction of facts and values

As discussed above, once DNV had become involved, there was little or no dispute over facts. Stakeholders appeared to regain confidence in the ability of Shell to do its job properly, to know what it was doing within its area of expertise. Similarly, the fact that DNV’s independent evaluations of the various options put forward by the contractors was available meant that stakeholders also had confidence in their factual basis. Shell was explicitly concerned to allow stakeholders to express their opinions and to apply their values to the various options, and it is very striking that this was largely not done in an ‘emotional’ way but rather through the deployment of ‘rational’ criteria in the form of the energy balance test and the waste hierarchy.

3.2.4. Defining the role and scope of expertise

Again, once the initial dispute over the amounts and levels of toxic residues in the Brent Spar had been resolved with the intervention of DNV, expertise was not an issue in this case. The expertise of the operator and contractors was accepted within the confines of their technical domains, while the operator was prepared to accept the input of other stakeholders when it came to the criteria to be used to rank technically feasible options. A caveat should be entered, however, in terms of the concerns raised by Greenpeace about the limits of the process.

3.2.5. How experts declare interests

The interests of all parties were very well understood by all stakeholders. Further, the initial loss of confidence had been so profound that any party (and in particular Shell) had a very great deal to lose by any lack of candour about its interests.

3.3. The stakeholder involvement process: influence of stakeholders' watchfulness on trust and confidence

3.3.1. Why is stakeholder involvement needed?

Stakeholder involvement was needed in this case because Shell found itself in a position where it had suffered a severe loss of confidence, notwithstanding that it had followed regulatory requirements to the letter and was itself convinced that it had arrived at the BPEO for the disposal of the Brent Spar. Recognising that the public had no confidence in the regulatory process, it therefore ignored DTI demands that it proceed as agreed and instead opted to start the decision making process again, this time with the involvement of stakeholders.

3.3.2. Who are the stakeholders involved?

This has been described above.

3.3.3. How are they represented?

This has been described above.

3.3.4. How are stakeholders encouraged and enabled to take part in the decision making process?

Shell funded the entire Stakeholder Dialogue process, although no one was paid to attend. It approached an independent organisation, the Environment Council, to arrange and facilitate the process so that none of the stakeholders felt that they were simply puppets in a public relations event. The Council sought out stakeholders, thus ensuring that those involved were not seen as those who would be 'friendly' to Shell's interests. Greenpeace has, of course, voiced concern about the success of this approach with respect to the UK meetings. Ongoing meaningful participation was assisted by the fact that stakeholders had direct access to the operator, bidding contractors and independent

evaluations, as well as to a range of resources designed to assist understanding of the technical dimension.

3.3.5. What is the aim of stakeholder involvement?

The key aim was to ensure that the decision ultimately reached on the disposal of the Brent Spar would be as widely acceptable as possible—in stark contrast to the position with the original decision. The decision itself was not delegated to the Stakeholder Dialogue process: it was Shell who ultimately made the choice between the deep water and quay extension options. However, the process of narrowing down the technically feasible options and arriving at the final decision was significantly influenced by input from the Stakeholder Dialogue process to the technical process. Given the aim of achieving broad acceptability in the context of the profound loss of confidence that the initial decision had precipitated, re-establishing trust was of paramount importance for the operator. It is very interesting to note, however, that by the time the Stakeholder Dialogue process was underway, the attitude of the public at large and the stakeholders directly involved towards Shell had already significantly improved. It appears that the mere fact of having abandoned the original plan in defiance of a very robust government and regulatory position already served to begin the process of re-building trust, as it was taken as an indication that Shell was prepared to listen to public opinion. Thereafter, each progressive step towards the establishment of the Stakeholder Dialogue process had a positive impact and a key turning point came with Greenpeace's acceptance that its initial claims on toxicity had been wrong and DNV's verification of Shell's original data. Thus, in the circumstances of the case, the very fact of moving from the traditional regulatory approach towards a stakeholder involvement process had very positive effects. By the time the process commenced, the public concern with the Brent Spar disposal had very significantly diminished. Thereafter, the presence of independent facilitators and technical experts were key components in ensuring that stakeholders had confidence in the process and thus that the process served to continue to allow trust to be rebuilt.

3.4. Factors integrated into the decision framing and decision taking process

3.4.1. Extent of social trust

The decision to move to the Stakeholder Dialogue process was very much premised on the fact that confidence had been lost both in Shell's plan to dispose of the Brent Spar in deep water and in the regulatory process that verified and approved that plan. The Stakeholder Dialogue process was therefore all about rebuilding social trust and re-establishing confidence. While the DTI were initially sceptical about the process, it nevertheless also served to demonstrate to stakeholders that the regulator had indeed rightly confirmed deepwater disposal as the BPEO. Noting the success of the process, the DTI rapidly changed its view and now routinely uses stakeholder involvement itself.

3.4.2. Extent of uncertainties

This issue has been discussed above.

3.4.3. Nature and complexity of the problem

Both Shell and the independent facilitator noted that it was at times difficult to convey complex technical data to stakeholders who lacked the relevant expertise. Instead of simply ignoring this problem, Shell sought to develop resources (especially graphical tools) that could be used to make complex issues more readily understandable. It was also the case that the involvement of DNV was important in this regard. They were completely transparent in their operations, producing very detailed reports. While many stakeholders made no attempt to read and digest all of this material, they had confidence in the organisation and accepted their 'bottom line' conclusions. With end results data thus not contentious, stakeholders were themselves then able to use relatively sophisticated tools to rank options and arrive at proposals.

3.4.4. Dilemmas and trade-offs

The process allowed all involved, operator, contractors and other stakeholders to confront the dilemmas and trade-offs that are an inevitable part of any complex decision. Thus the open dialogue allowed stakeholders to understand the technical constraints under which the operator had to act—irrespective of their preferences on other criteria. Equally, the process enabled the operator to see that some technically feasible options which it might otherwise have pursued would have to be abandoned one the grounds that they conflicted with other criteria set by the stakeholders, for example, the proposal to bury the installation in a dredged trench. All of that said, the question raised by Greenpeace about the extent to which the broader context was excluded remains.

3.4.5. Importance of reaching broad agreement

As was discussed above, Shell never intended that the Stakeholder Dialogue process should aim for consensus. Especially given the fact that it wanted to set time limits and especially given the extent to which public confidence in the organisation had been lost, it must have felt that consensus was an unreachable goal. The aim rather was to ensure that whatever decision was ultimately reached, stakeholders could accept it on the basis that the process of reaching it had been fair and open, even if they did not agree with the decision itself. To a very great extent, however, it appears that there was very broad agreement with the decision as well as a very good measure of satisfaction with the process—excepting, of course, Greenpeace's concerns about its limitation to the Brent Spar case and the adequacy of the balance of the stakeholders in the UK meetings.

3.4.6. Consideration of other factors: benefits, justification, sustainable development and equity

The original regulatory process may be said to have explicitly or implicitly considered all of these factors insofar as it was based on the establishment of the BPEO. The top-down model of regulation proceeded on the assumption that regulators in a democracy should be regarded as guardians of the public interest and capable of balancing the

complex array of risks and values involved in technological decisions. The furore produced by the Brent Spar decision served as a very stark warning that that assumption is no longer tenable in all cases—however robust the decision actually turned out to be. The difference with the Stakeholder Dialogue process was that it allowed all of these factors to be addressed in such away that all involved stakeholders could see what was important to the others, what needed to be prioritised, what was practically possible, and so on, rather than this being done essentially in a conversation between operator and regulator 'behind closed doors'.

3.4.7. Use of scientific information and expert advice

As discussed above, the Stakeholder Dialogue process was marked by its complete openness and thus the full availability of all relevant information and expertise to all the stakeholders. These were of crucial importance to the decision making process because although the aim was to utilise the Stakeholder Dialogue process to dovetail with the technical process, the former very much proceeded on the basis of sound science and with significant input from experts, whether the operator, the contractors or the independent DNV. They were also regarded as fundamental to the reaching of a good decision. All stakeholders realised that doing nothing with the Brent Spar was not an option; it had to be disposed of in some way. Equally, all stakeholders, even those most hostile to Shell, were keen that the final decision should be the most environmentally sound, an assessment that could only be achieved through the use of the best science, albeit it informed by the other values that stakeholders thought important, namely positive energy balance and the waste hierarchy.

3.4.8. Sensitivity to local context

There are two ways of looking at this issue. First of all, it may be said that the process was sensitive to local context inasmuch as local societal effect was one of the explicit components of the environmental evaluation conducted by the stakeholders. On the other hand, the fact that the meeting held in Germany was not regarded as an unqualified success may be said to indicate the extent to which the *process itself* was not fully sensitive to the local cultural context. There is surely a lesson here for any similar trans-boundary processes in future, not least at the European level.

It is worth noting here that the quay extension at Mekjarvik would have gone ahead whether Brent Spar had been allocated to that use or not. That decision had already been taken and was accepted locally. Given that the proposed use of Brent Spar involved only the placement of cleaned and inert sections, there was no qualitative difference from the alternative new build option. As a consequence, and particularly as re-using Brent Spar in this way meant cost savings locally, there was no local resistance to the plan.

3.4.9. Taking account of cost

Because the BPEO approach was used, cost was the third main factor to be considered once technically feasible options had been agreed. Environmental and safety factors

ranked above it. It should be noted that Greenpeace's view is that cost should not have been a factor at all.

3.4.10 Subsidiarity and local norm-setting

While the ultimate decision on a disposal option remained with the operator, it is clear that it would not have gone against the clearly expressed views of the other stakeholders without returning to them to explain why. In the event, its decision was in line with that proposed by the other stakeholders. It may be said, however, that the process was open to subsidiarity and local norm-setting inasmuch as it was the other stakeholders who proposed the criteria of energy balance and waste hierarchy for distinguishing proposals which offered similar environmental advantages.

3.4.11. Differentiation of stakeholders

The high profile of this issue before it reached the stage of the Stakeholder Dialogue process meant that the roles of the various stakeholders were very clear. Equally, it seems that the stakeholders were very good at identifying the independent parties (and verifying their independence).

3.5. The implementation of decisions and review

In the particular circumstances of this case, where the ultimate decision was essentially irreversible and involved the re-use of an inert structure as a quay extension, the need for review mechanisms was not great. It should be noted, however, that the decision taken by Shell (and which coincided with that proposed by the stakeholders) had to be approved by the DTI as representing the BPEO (or being at least as good as the original plan).

4. CONCLUSIONS

Perhaps the key lesson to be drawn from the Brent Spar case study is that even when a regulatory process is robust and seen by technical experts to produce a decision that is sound on all significant measures, this will count for nothing if the public at large simply do not have confidence in that process as a result of some perceived critical failing.

In the case of Brent Spar, the perceived critical failing came when Greenpeace provided dramatic pictures of their occupation of the installation to the media accompanied by claims about the environmental hazard it represented that were completely at odds with those of both the operator and the regulator. With confidence gone, it was a matter of rebuilding social trust in the regulatory process. In contemporary conditions, however, both trans-national corporations and governments find it difficult to compete with NGOs, especially those concerned with unquestionably good causes such as the environment, when it comes to the issue of trust. People were simply more ready to trust the NGO, which was not seen to have a vested interest in the project, than they were to

trust the oil company or the government for whom a wide range of vested interests could readily be listed.

Beyond that is the fact that even Shell personnel instinctively felt that dumping the Brent Spar in the North Atlantic was wrong when they first heard about it and before they had seen the engineering rationale. For the public at large, this was also felt instinctively to be wrong, and furthermore to have been decided on behind closed doors.

In short, the regulatory process might have been flawless in all respects—it was simply that no one outside the process had confidence in it.

Faced with this situation, Shell was the first to realise that simply driving ahead with what it believed to be the right decision was not an option. It realised that with confidence in the process gone and public trust placed firmly in Greenpeace, an effort was required on its part to build social trust in it and to re-establish public confidence in its ability to carry out its operations.

The government, on the other hand, took the opposite view initially. It is easy to be critical of this with the benefit of hindsight, but it is important to realise what was at stake from its perspective. A dangerous precedent was being set where robust regulatory decisions could be ignored on the basis of illegal activities by unelected NGOs and what it saw as uncritical and inaccurate media coverage. The widely divergent but equally understandable reactions of operator and regulator in this case throw into sharp relief the problems facing traditional regulatory techniques in contemporary conditions. In such conditions, it may take the sort of process described in this case study to build trust and re-establish confidence.

APPENDIX 1. – COMMON INTERDICIPLINARY ANALYSIS FRAMEWORK

The criteria presented in this appendix have been used for the assessment of the case studies in order to ensure a consistent analysis of the cases in the different countries involved, and to progress in the understanding of key dimensions in the quality of risk governance processes. These criteria do not represent a strict questionnaire for the surveys, but some dimension of risk governance which have been addressed when analysing the different case studies.

Though these different criteria are much interlinked, it is possible to identify different dimensions which will be developed hereafter:

- The guiding principles of the decision-making process
- The role of expertise
- The stakeholders involvement process
- The factors integrated into the decision-framing and decision-taking processes
- The implementation of decisions and review

It can be noticed that these criteria result from the TRUSTNET project[117] dedicated to risk governance in Europe, as well as from the reflections of the RISGOV team.

1. The guiding principles of the decision-making process

The governance of hazardous activities is based on a series of basic principles which guide the decision-making process. These principles are often referred to as a support to decision and action : prevention, precaution, substitution, justification, risk assessment, norm setting to name but a few…. The ways these principles are introduced, interpreted and articulated in the decision-making process may differ significantly from one hazardous context to another.

The studies will explain the rationales of these principles in the specific cases observed.

· What is the rationale of the risk governance principles behind the decision-making process ?

[117] For more information on TRUSTNET, see web-site : http://www.trustnetgovernance.com

- What are the objective of risk governance in the case : avoid risk, question the justification of the hazardous activity, set norms to limit risk at emission, set norms to limit risk at environment (concentration), develop Best Available Techniques…?
- How do these principles contribute to improve the governance of hazardous activities ? In which way do they enhance improvement ? What are the possible blockages in their implementation ?

2. The role of expertise

A set of criteria relates to a specific part of the process, i.e. expertise. The purpose of these criteria is to clarify the role of expertise in the decision-making process, and the ways it informs the process taking into account uncertainties, value-judgements, and controversies.

- How are uncertainties identified ?
- Are dissenting views encouraged ? How are they reported ?
- To what extent are facts and values distinguished ?
- How are the role and scope of expertise defined ?
- How do experts declare their interests ?

3. The stakeholders involvement process: influence of stakeholders' watchfulness on trust and confidence

The trust and confidence model proposed in TRUSTNET is useful to analyse how stakeholders involved in a dialogue on a risk situation can improve trust and confidence where these have been previously damaged or challenged.

Confidence is the everyday relation each individual usually develops with his/her environment : it reflects a situation where the individual feels carefree, is familiar enough with a technical system and the people in charge of its operation not to worry about it. Blockage in decision regarding hazardous activities often results from a crisis of confidence. When broken, confidence cannot be built again from scratch. As a prerequisite it is necessary that some key stakeholders – first opposed following this crisis of confidence – rebuilds trust one in the other. Unlike confidence, trust is a personal relationship between individuals; it is experienced, tested and strengthened

through mutual dialogue and confrontation. Once it is developed, this mutual trust brings reflected confidence to the larger community concerned by the hazardous activity.

Some stakeholders play a key role in rebuilding trust : they relay the questions and concerns of a large part of the community and raise them in front of the institutions in charge of the operation and control of the hazardous activities. These *relay actors* have direct contact with the industry operators and the regulators. They try hard to receive direct answers to their questions. This confrontational dialogue is a major element in trust building, but also in confidence building. This is because the *relay* actors test and experience the operators' and regulators' trustworthiness that the community as a whole may gain confidence again in the technical operation of hazardous activities.

One important dimension in this trust building process is the fact that *relay* actors by their questioning attitude make more explicit to the community the differing roles of the two institutions responsible for hazardous activities, the operator on the one hand, the regulator on the other hand.

As a support in this reflection three graphs are proposed at the end of this Appendix.

The following questions are helpful to address this question :

- Why is stakeholder involvement needed ?
    - Blockage ?
    - Distrust ?
- who are the stakeholders involved (operators, regulators, experts, elected representatives, NGOs…) ?
- how are they represented, participating ?
- how are stakeholders encouraged and enabled to take part in the decision-making process ?
- what is the aim of the stakeholder involvement process ?
    - is trust a goal shared by the various stakeholders involved ?
    - is there a value in the way the process itself is run ?

The question of stakeholder involvement and trust is connected with expertise (see above) and integration (see below). In this respect there is interest in considering how the ways expert advice is secured and used and contributes to building social trust.

4. The factors integrated into the decision framing and decision taking processes

As far as risk governance is concerned, the decision-making process often relates to complex situations and need to consider in a comprehensive way the various (and often competing) factors which are at stake in risk governance (risk, sustainable development...) and the different goals the decision-making process is expected to meet (protection, agreement, equity...).

This implies that eventually the decision-making process integrates these different factors to come up with a decision. This integration may be carried out in different ways. Integration can be achieved by the ultimate decision-taker at the very end of the process. Alternatively, it can be made by the various stakeholders involved in the framing of the decision before the decision is formally taken.

The questions below can be used to characterize how the decision making process can integrate – beside scientific aspects – society needs all along the decision path.

- How does the decision-making process take into account the following factors :
  - Extent of social trust
  - Extent of uncertainties
  - Nature and complexity of the problem
  - Dilemmas, trade-offs
  - Importance of reaching broad agreement

- Beyond risk, what kind of consideration is given to the following items :
  - Benefits
  - Justification of the activity
  - Sustainable development
  - Equity

- How is scientific information and expert advice used ?
  - Are they put in the public domain ?
  - What is the relevance of these in the decision-making process ?
  - How do scientific information and expert advice contribute to a good decision ?
  - How are they put in perspective with other factors ?
- To what extent is the decision-making process sensitive to local context ?
- How is the local factors balanced with equity and utility ?
- How does the decision-making process take account of the cost of protective measures ?
- How does the decision-making process give room to subsidiarity and for norm-setting at the local level ?
- How does the process enable stakeholders to identify different players ? (differentiation of the roles of the players : operator =/= regulator)
- How do stakeholders perceive their contribution and role in the decision-making process ?

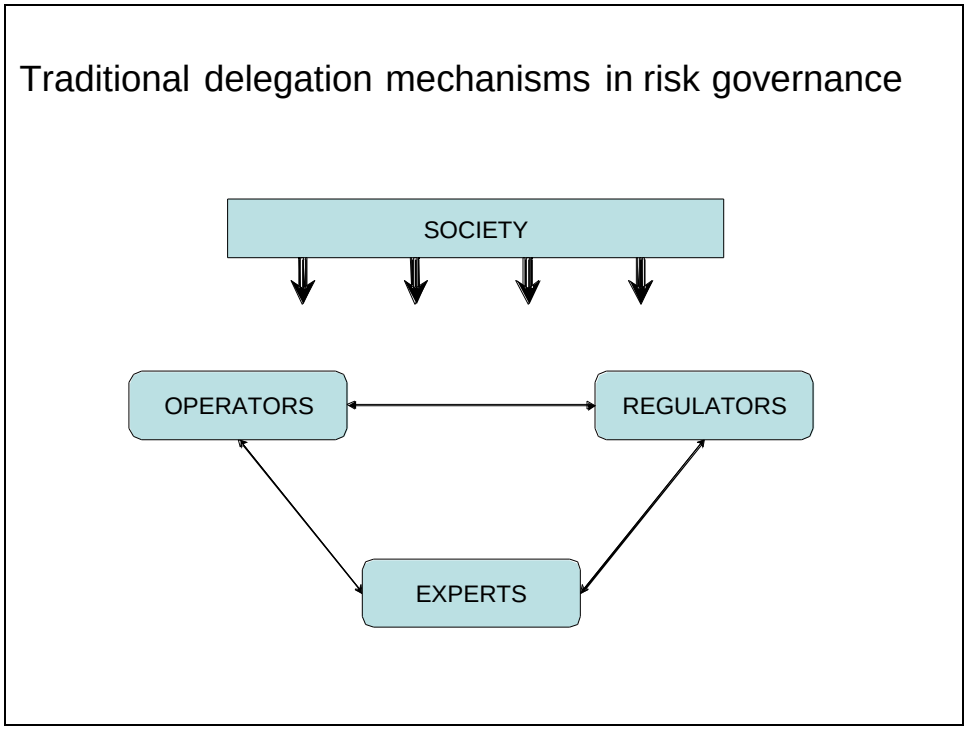
5. The implementation of decisions and review

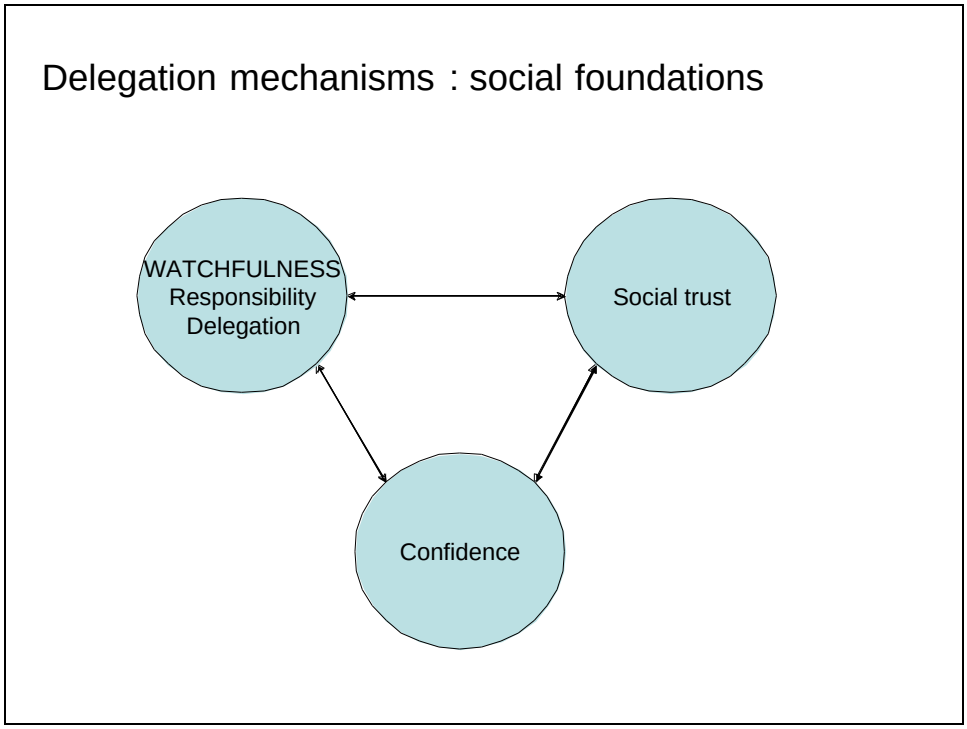
Eventually the decision-making process in itself will be evaluated in its ability to convey the different dimensions of risk governance, but also to follow up and review decisions against change. The decision-making process indeed does not end with one decision. It also includes capacities to follow-up and review decisions to check whether they properly answer the issue as it was framed and to take additional measures if required.

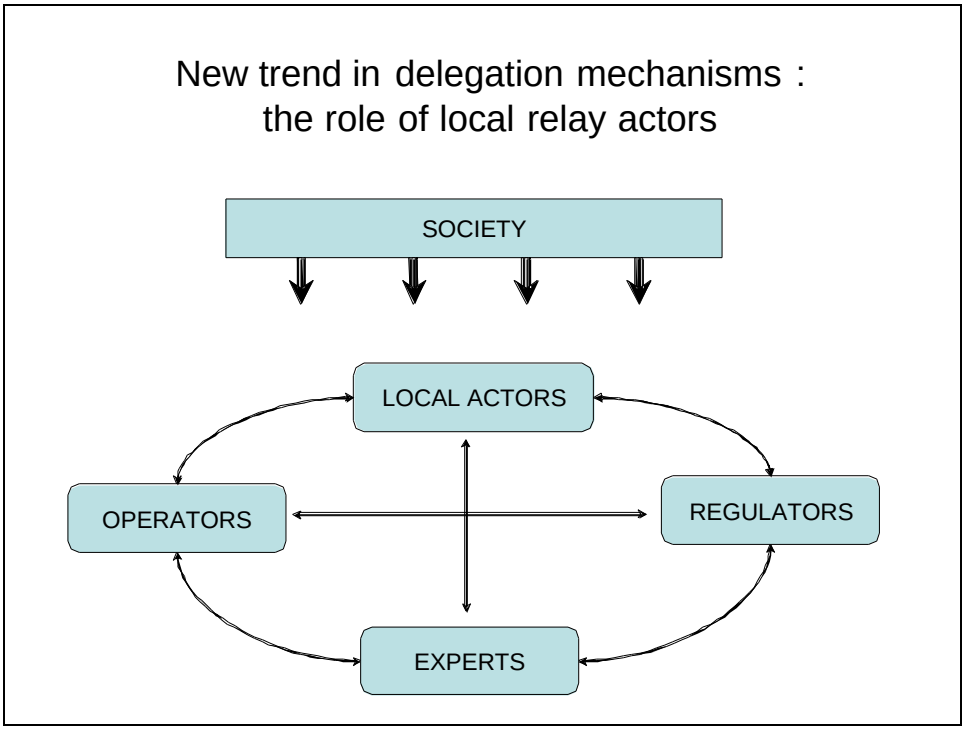
- What are the mechanisms for revising the decision when the conditions for the decision have changed ?
- How is the implementation of decisions evaluated ? How regularly ? What kind of system provides for check and progress ?

STAKEHOLDER INVOLVEMENT

These graphs have been proposed for discussion within the research team.






New trend in delegation mechanisms :
the role of local relay actors
SOCIETY
LOCAL ACTORS
OPERATORS
REGULATORS
EXPERTS