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# EVALUATION REPORT OF THE NORDIC-BALTIC ANNEX TO THE INEX-2-FIN-EXERCISE APRIL 17, 1997

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# EVALUATION REPORT OF THE NORDIC-BALTIC ANNEX TO THE INEX-2-FIN EXERCISE

## INTRODUCTION

Under the auspices of the NKS programme and as a part of EKO-4 project a special Nordic-Baltic emergency exercise was carried out. In order to rationalise exercise activities it was organised as an annex to the international INEX-2-FIN exercise arranged by the OECD/NEA on April 17, 1997. Some countries carried out simultaneous national exercises as well. Only the Nordic-Baltic exercise is discussed in this report.

The objectives of the INEX-2-FIN exercise were to test real time information exchange, decision making based on plant conditions and real weather, and public information. These objectives determined the framework for the scenario and necessary scripts of the exercise.

For the Nordic-Baltic annex of the exercise five more detailed objectives, subordinated to the INEX-2-FIN objectives, were defined by the planning group under EKO-4 project. Since the exercise was the first of this kind for the Baltic countries only one of the special objectives was designed for them, namely N4.

An independent evaluators group, consisting of one member from each participating country plus a chairperson, was set to evaluate the Nordic-Baltic annex of the INEX-2-FIN exercise. However, because of lack of personnel in the Baltic countries the evaluators were the same persons as in the planning group.

# 1. THE NORDIC-BALTIC OBJECTIVES OF THE EXERCISE

The objectives designed by the planning group for the Nordic-Baltic annex of the INEX-2-FIN exercise were in short as follows:

**N1 "Estimation and assessment of the situation in real time in threat phase, release phase and by prognoses for the following day."**
This objective had specific preplanned questions (see Annex 1) for each phase to be answered and the intention was to test whether consistent conclusions were drawn of the situation in the Nordic countries, and if not why.

**N2 "Follow key information in the Nordic countries".**
Under this objective eight items were identified by the planning group as key information. The efficiency of distributing and transmitting the key information and the possible changes in its contents were to be assessed. The objective concerns both the authorities and the media information regarding timing, consistency, comprehensibility and completeness

**N3 "Co-ordination of recommendations".**
Under this objective three questions (see Annex 2) were to be answered by the authorities in the Nordic countries and contacts were expected between the Nordic countries prior to recommendations on actions/non actions.

**N4 "Baltic-Nordic co-operation".**
This objective dealt with exchange of key information by the authorities between the Baltic countries, and between the Nordic and the Baltic countries. The key information items identified by the planning group were the same as in **N2** for the Nordic countries.

**N5 "Journalists in Finland reporting back to national media".**
The purpose was to compare the accident picture given through the national authorities and that given by the media and based on Finnish authorities as a source, paying attention to the comprehensibility of the language.

# 2. PARTICIPATING ORGANISATIONS

The participating organisations and the number of people in each country are given below, without distinguishing whether they actually acted in the Nordic-Baltic annex to INEX-2-FIN or only in INEX-2-FIN. Possible additional participants in the national exercises are not always included. Organisations in bold letters exercised in separate places.

**Denmark**, 70 persons.
**Command Centre for the Danish Nuclear Preparedness (CCNP),** in which the following bodies are represented: Emergency Management Agency, National Institute of Radiation Hygiene, Denmarks Meteorological Institute, Risø National Laboratory, Chief of Defence, State Police, Plant Directorate, National Food Administration, Directorate of Fisheries, Danish Radio and Ritzaus Bureau.
**Denmarks Meteorological Institute**
**Flagofficer Denmark**
**Airtraffic Service Denmark**

**Finland,** appr. 340 persons.
**STUK (Radiation and Nuclear Safety Authority previously Finnish Centre for Radiation and Nuclear Safety)**
**Ministry of the Interior**
**Ministry for Foreign Affairs**
**Ministry of Agriculture and Forestry**
**Ministry of Trade and Industry**
**Ministry of Transport and Communications**
**Ministry of Social Affairs and Health**
**National Food Administration**
**Information Unit of the Council of State**
**Uusimaa Provincial Government**
**Kymi Provincial Government**
**Loviisa Regional Authority, Emergency Response Centre**
**Kotka Regional Authority, Emergency Response Centre**
**Pyhtaa Municipality**
**Loviisa Power Plant (IVO) and IVO Power Engineering in Helsinki**
**Finnish Meteorological Institute (FIM)**
**some others**

**Iceland,** appr. 20 persons.
**Geislavarnir rikisins (Icelandic Radiation Protection Institute)**
**Veðurstofan (Icelandic Meteorological Office)**
**Hollustuvernd (Environmental and Food Agency of Iceland)**
**Almannavarnir (National Civil Defence of Iceland)**
**Heilbrigðiseftilit Kjósasvaeðis (Environmental and Public Health Control)**
**some others**

**Norway,** appr. 140 persons.
**Norwegian Radiation Protection Authority (NRPA)**
**The Crisis Committee for Nuclear Accidents** in which the following bodies are

represented: Norwegian Radiation Protection Authority, Directorate of Civil Defence and Emergency Planning, Shod Norway Military Head Quarter, Department of Police in the Ministry of Justice, Directorate of Health and the Norwegian Food Control Authority.
**The Advisory Committee** was represented by:
Institute of Energy Technology
Norwegian Meteorological Institute (DNMI)
Norwegian Institute for Air Research
Further more Emergency departments of **three counties**

**Sweden,** 75 persons.
**Swedish Radiation Protection Institute (SSI)**
**National Food Administration (SLV)**
**National Board of Agriculture (SJV)**
**National Board of Health and Welfare (SoS)**
**Swedish Nuclear Power Inspectorate (SKI)**
**Swedish Meteorological and Hydrological Institute (SMHI)**
**Ministry of the Environment and Natural Resources**
**Ministry of Defence**
**Scandinavian Airlines**
**Six of the county administrations**

**Estonia,** 24 persons.
**Radiation Protection Centre**
**National Rescue Board**
**Institute of Meteorology and Hydrology**
**Ministry of the Environment**
**National Maritime Board**

**Latvia,** appr. 80 persons.
**Civil Defence Centre of Latvia (CDC)**
**State Hydrometeorological Agency**
**Radiation and Nuclear Safety Inspectorate (RNSI)**
**Environmental Data Centre**
**National Environmental Health Centre**
**Border Guards**
**Aviation Rescue and Search Co-ordination Centre**

**Lithuania,** 14 persons.
**Environmental Protection Ministry (EPM)**
**Radiation Protection Centre (RPC) under the Health Ministry**
**Hydrometeorological Service (HS) under Ministry of Environmental Protection**
**State Nuclear Power Safety Inspectorate (VATESI)**

The media were simulated by students from the Danish School of Journalism and the University of Tampere acting as Nordic correspondents and they were stationed at STUK/Finland. Further more professional reporters participated from Danish Radio and Ritzaus Bureau (situated in the Command Centre, CCNP, in Denmark), Finnish News Agency, Finnish Broadcasting Company, Norwegian Central Information Service, Morgonbladet in Iceland, and from Sweden and USA.

# 3. EXERCISE METHODOLOGY

## SCENARIO/ SCRIPTS

The scenario for the exercise was prepared by Loviisa power plant (IVO) in co-operation with STUK.

General features of the scenario were
- real weather 17.04.1997; no extreme situations
- several hours, progression of the threat phase and later a release
- release of such a magnitude that requires protective actions in the vicinity of the plant, INES 4...5 severity
- various events during the whole exercise
- unexpected problems
- countermeasures need negotiations between various organisations.

In the initial situation Loviisa-2 unit has outage. There is shortage of electricity supply in the Nordic countries.

The initiating event takes place 05.00 UTC and is an air crash on a highway causing loss of electricity in high voltage lines.

The safety systems do not function as on site diesel generators do not start and there is no electricity to motors. The reactor control rods do not move and the neutron chain reactions continue; an ATWS (anticipated transient without scram) as a result, which means that there is an internal alert situation at the plant.

The threat increases because of containment ice condenser malfunction 07.10 UTC, loss of in-core instrumentation 08.00 UTC and core damage and pressurisation of containment 08 - 10 UTC.

Release into the atmosphere starts 09.33 UTC and continues until 12.50 UTC.

After that the threat continues because of high hydrogen concentration and possible burns in the containment until the termination of the exercise 16.00 UTC.

The releases in the plant were:

| | from the core | from the stack into the environment |
|---|---|---|
| Noble gases | 50 % | 3 % |
| Iodines | 11 % | 0.02 % |
| Caesium | 1 % | 0.0002 % |

A detailed script of the events at the NPP was prepared to be fed into the exercise process.

The scripts for the questions to be put to the participants from the Nordic countries as part of the exercise were prepared in the Nordic countries in national languages as outlined in

the write up, concerning the objectives of the exercise, prepared by the planning group of the Nordic-Baltic annex to the INEX-2-FIN.

## IMPLEMENTATION

The power plant processes were simulated with the on-site simulator and in-plant radiology and releases were calculated with the help of Exel-tables. A computer system was used to calculate the radiation situation using predetermined source term and nearly real time weather information. The Silja code developed in Finland was used at the Finnish Meteorological Institute for transport and dispersion calculations and at the Finnish Technical Research Centre for dose rate, air concentration and fallout calculations. A Cray C94 computer was employed in the dispersion calculations. Meteorological input data into the Silja code were taken from the HIRLAM weather information system.

The personnel of the Loviisa power plant participated in the exercise by alarming according to their emergency plan; they gave rapid reporting of accident progression to the Finnish nuclear safety authority (STUK), including 500 parameters / 5 minutes automatically; they assessed the threat, the potential for release and environmental consequences, and did other tasks according to their emergency plan.

Real weather during the exercise was observed and predicted by the FMI. The wind was first towards south-east, with the risk of sea wind, that did not appear. Later the wind was towards south. The wind speed was 20 km/hour. No precipitation occurred.

For other participating organisations the exercise was a mixture of "table top" and "command post" exercises in which the main emphasis was in

- assessment of the situation and decision making, based on plant conditions,
- assessment of the consequences of the release and of the threat of possible hydrogen explosion,
- information exchange between the countries and
- information to the public.

The emergency preparedness organisations in the Nordic countries are described e.g. in the "Beredskapshåndbok" revised in 1997 as part of the EKO-4 project. Short description of the tasks of the different organisations participating in the emergency response in the Baltic countries is presented in Annex 3.

Since real weather was used, it was not foreseen how much action was required in other Nordic countries than Finland and in the Baltic countries. The main approach therefore was in the central emergency organisations to react (get confirmation, decide on actions and provide information to other authorities and to the public) to the information coming from Finland. This means that the activities exercised would be very unevenly distributed between the countries.

## EXERCISE DIRECTIVES

Some countries (Finland, Iceland, Norway, Sweden) prepared detailed exercise directives, following the advise given in INEX-2-FIN directives, with requirements for

preparatory work before the exercise, objectives and scope of the exercise, available communication channels, procedures for Nordic exchange of data from measurements, participants etc., some (Denmark, Estonia, Latvia) briefed the participants orally before (shortly before - 1 month before; Estonia and Latvia distributed also the INEX-material in advance to the participants) the exercise started. No special Nordic-Baltic directive was prepared for the exercise.

Participants representing the press were only shortly briefed in advance on the limitations of the exercise and on the participating organisations.

# 4. EVALUATION CRITERIA

Evaluation of the exercise is composed of three elements:
- observations
- appraisal of the findings with assessment in relation to the objectives
- recommendations based on the observations and appraisal.

In order to assess how the objectives were met and where improvements are most needed, the relative strengths and weaknesses of the co-operation between the countries need to be weighted. For consistency between the different objectives and functions the following three-point scale was used in the overall appraisal:

**good,** implying that adequate support for other Nordic countries was provided (N2) for making consistent assessment of the situation possible (N1), and thus to enable implementation of consistent protective actions (N3) and informing the public consistently and comprehensively (N5), all that in a timely manner.
For the Baltic countries only efficiency and correctness of the information exchange is appraised (N4).

**satisfactory,** implying that the objectives were met with only minor failings.

**unsatisfactory,** implying significant shortcomings, which could have delayed the taking of vital actions and thus increased the risks to persons or caused unnecessary expenditure.

# 5. EVALUATION

## 5.1 EXERCISE METHODOLOGY

### OBSERVATIONS, APPRAISAL AND RECOMMENDATIONS

The scenario was well prepared. Given technical information allowed nuclear safety authorities in other countries to assess the severity of the situation if they wished to do so. SKI/Sweden used fully this opportunity. Having access to information computers in STUK/Finland through oral phone contacts, SKI made similar assessments and prognoses as STUK. SKIs calculations agreed well with those made by STUK. Other Nordic countries did not have such frequent contacts to obtain large amounts of process data nor experts to evaluate such information.

By ensuring the presence of technical experts in each emergency organisation, the interpretation of technical information could be improved also in non-nuclear power countries.

Real weather of the day allowed the meteorological institutes exercise fully for the first time in such an international emergency exercise. For the Baltic-Nordic co-operation the accident scenario and the weather offered good provisions, while for the Nordic co-operation by the emergency organisations as a whole, the weather limited the need for co-operation to travel problems and to the public information. It is emphasised that depending on the objectives, in future exercises real weather should be used or "another day´s weather" as appropriate.

Regarding the information distribution from the accident country the exercise offered the possibility to compare - for timing and content - the transmittance of information directly (based on bilateral agreements), via EU and via IAEA. As communication channels were used telephone, telefax, telex, e-mail and internet. Of these the telex is undoubtedly the least effective. Telefax was the most used, complemented by telephone discussions. E-mail was increasingly used. The internet address, user ID and password were informed to the focal points in the Meteorological Services in the Baltic and the Nordic countries. Other information, (if not part of the notification system maintained by the international organisations), necessary for communication is assumed to have been distributed as part of the INEX-2-FIN exercise as well.

Dispersion model products like trajectories, total external dose rate, estimated air concentrations and deposition of radioactive matter were transmitted through internet from Finland and Sweden. Norway did neither read nor transmit meteorological information by internet.

Also additional meteorological data from surface observation stations, sounding stations (Jokioinen, Tallin) and weather mast in Loviisa were transmitted through WMO´s telecommunication network (GTS). For more details see section 5.2.

The use of internet to transmit meteorological information has many advantages compared with e.g. telefax. With internet colour images were clear which is not the case with telefax. It also reduced the use of telefax, which could then be used for other type of

information exchange. Internet pages could be updated regularly and new information was immediately available for those who needed it. Another area where internet was tested was press releases. Internet is fast, but not always sufficiently concise. In principle, though, it is one possibility for the authorities to inform the public independent of the media. This is discussed more in Ch. 5.6

Severity of the accident was challenging for the media informing the public. For the Nordic correspondents STUK, as the expert advisory body, was probably not the best place to get an overview of the situation. The local emergency response centre or the Ministry of interior could have been more appropriate bodies to inform about general questions of the situation, although technical questions will also arise and have to be answered by technical experts. As the foreign correspondents were not sufficiently briefed in advance about the limitations of the exercise, their expectations of an exercise to fully correspond a real situation were probably too high. As to the realism of the Nordic comparisons it is vital that journalists participating in Nordic reporting exercises, have similar backgrounds or functions. A large part of the differences between journalists noticed during this exercise may be due to the fact that not all of them were all-round reporters. Some were information officers in public agencies and others were specialist journalists with highly specialised magazines.

The inclusion of Nordic reporters in the exercise is valuable, but it may be made more realistic as to both form and content. In this respect it is important that the editorial offices reserve the relevant reporters for the exercise in time and in sufficient numbers, and that briefings of participating journalists are made on the same level as of other participants in the exercise.

Planning of the exercise by the Nordic-Baltic planning group was limited to the special five objectives. In the same write up they also explained how to do the evaluation. The latter was not always clear as the group was not acquainted with the scenario and could not know the weather. Nevertheless, the evaluation group followed the advise given by the planning group, trying to interpret it as the situation required. For instance the questions of the "first information" (official or other reliable) were not always clear and answers directly found from the logbooks (e.g. magnitude of the release can only be assessed fully after it has stopped).

It is known to be very difficult to plan good and realistic requests to be inserted into the exercise in order to get the players react as in a real situation. The planned questions for objectives N1a and b and N3a to N3c were rather informal. The response to these requests can therefore give wrong picture of the emergency organisations ability to continuously have updated information on the current status of the accident and to promptly and adequately estimate the consequences of the accident and make prognoses of what is going to be the result. In an accident situation more important requests and work will have priority. Answers to informal requests can be delayed or answered only briefly even if emergency organisations have reasonably updated information and fair estimates of the consequences of the situation.

The planning group also meant that the evaluation is solely carried out after the exercise on the basis of the log books, no briefing in advance nor work during the exercise. However, the evaluation group held one planning meeting and prepared short evaluation directive before the exercise. This was absolutely necessary in order to have some

common understanding about the framework of the evaluation, but more Nordic-Baltic and national preparation and some work during the exercise would have helped to collate the relevant information and draw conclusions.

## 5.2 METEOROLOGY

### OBSERVATIONS, APPRAISAL AND RECOMMENDATIONS

Meteorological services of the Nordic and Baltic countries participated in the exercise. The Nordic Meteorological Institutes have signed an agreement in 1994 on exchanging information in the event of s nuclear accident or other accidents causing enhanced radiation levels. This could now be exercised with real weather of the day. Unfortunately the institutes were not all covered sufficiently in the national evaluation plans and thus evaluation of the Nordic-Baltic co-operation is also insufficient.

DMI in **Denmark** calculated, based on the HIRLAM weather information system:
- trajectories at different height levels
- plume dispersion by help of the ARGOS NT system.

A meteorologist was present in the expert group of the emergency organisation

FMI in **Finland** carried out the following activities:
- normal weather observations,
- normal upper-air weather soundings (inclusive stations closest to Loviisa, Jokioinen,Tallin/Estonia and St.Petersburg/Russia)
- extra weather soundings at a mobile sounding station near Loviisa NPP in co-operation with the Finnish Defence Forces
- intensified weather soundings at FMI´s own station Jokioinen and at Tallin/Estonia
- extra upper-air radioactivity soundings at Jokioinen
- weather mast observations at the NPP site
- dispersion calculations were made with dispersion model SILJA, based on actual weather data and HIRLAM-numerical weather prediction model (NWP). The calculations consisted of
    - * trajectories
    - * external dose rate (15 radionuclides) from cloud and fall out
    - * air concentrations of radionuclides near ground (based on a release of 1E17 Bq Iodine-131)
    - * total deposition on the ground (based on a release of 1E11 Bq Cs-137).

The extra and intensified weather soundings were distributed via GTS and the radioactivity soundings stored on the FMI´s server for reading with help of internet. Weather mast observations were distributed via GTS, and stored in the FIM server for reading with internet.

Transmittance of data from new extra stations was exercised for the first time via GTS. The availability of the data depended thus also whether the mediator and receiver countries had made the necessary changes for data identification.

The results of the calculations were available as maps in colour on internet. The pages were updated three times during the exercise. The passwords to read the FMI server via

internet were sent to the meteorological services in the Nordic and the Baltic countries and to the central Finnish authorities. The prognoses were also sent by fax e.g. to DNMI/Norway. FMI received results of dispersion calculations from SMHI/Sweden and of trajectory and dispersion calculations from Bracknell and Toulouse (RSMC). A meteorologist from FMI was present in STUK.

IMO in **Iceland** received after request trajectories and dispersion calculations from RSMC Bracknell (NAME model) together with a joint statement from the Region VI RSMCs. The information was received by fax and forwarded to Geislavarnir together with traditional synoptic analysis and forecast maps.

DNMI in **Norway** produced 8 series of information during the exercise. This information consisted of

- maps of predicted plume dispersion using default parameters. They were calculated with SNAP model and based on HIRLAM weather data.
- trajectory calculations of air mass movements,
- maps of predicted air pressure
- maps of predicted precipitation
- maps of predicted dry, wet and total depositions.

DNMI did not distribute its calculations via internet but to the Norwegian emergency organisation as maps by fax. A meteorologist was present at the Crisis Committee for interpretation and assistance.

SMHI in **Sweden** made on regular intervals dispersion prognoses and distributed them by internet. The first prognoses was made with a default emission of Cs-137 8xE10 Bq/s and later as available with estimated emissions. The calculations were made with MATCH model based on HIRLAM weather data and they consisted of:

- air concentration of Cs-137 $Bq/m^3$
- total deposition of Cs-137 $kBq/m^2$ and
- integrated concentration of Cs-137 $kBqxs/m^3$.

A videoconference channel was established to assist in interpreting the maps presenting the prognoses. Also fax was used to send prognoses to SSI but it failed. Prognoses in internet are not stored as new become available, so the evaluators could not see them. From the use of internet SSI has good experiences, reading the maps requires more guidance in future.

EMHI in **Estonia** made besides the soundings and radioactivity measurements some trajectory calculations.

LSHMA in **Latvia** and HS in **Lithuania** received prognoses on maps from Finland and other Nordic countries and via IAEA contact points from the two regional centres Toulouse in France and Bracknell in UK.

The prognoses from Toulouse (transport model MEDIA) and Bracknell (transport and diffusion model NAME) were also received by fax by the Baltic and the Nordic countries, Iceland only from Bracknell. They consisted of:

- trajectories
- concentrations

– total deposition (wet and dry) of iodine and caesium.
Toulouse used as default emission of iodine 0.111E+09 Bq per hour and 0.167E+17 Bq per hour and for caesium 0.167E+15 Bq per hour. Bracknell used standard default values for iodine.

Trajectories calculated in the Nordic countries and in the two Regional Specialised Meteorological Centres are largely comparable, as interpreted from the images. It should be noted that results on the maps distributed during the exercise differ regarding the time span of the prognoses and the emissions used as the basis for the calculations. Also the base maps used are very different. These differences make direct comparisons difficult and more precise comparison would require calculations done for exactly the same emissions and time spans. Also the weather and dispersion models have some minor differences. Contacts between the meteorological services before making the forecasts available could not be identified by the evaluation group.

However, it can be concluded that dispersion calculations agreed reasonably well and pointed out areas at greatest risk. Continuation of co-operation in these matters is highly recommended.

A remark was made in some of the Nordic meteorological services that the prognoses from the Regional Centres took a very long time and were too "global". In some of the Baltic countries the first prognoses from Finland and the Regional Centres were interpreted to be differing. Co-operation with these centres is also important in order to avoid conflicting prognoses in an accident situation.

Overload problems were also observed in Finland in transmittance of meteorological data using NMT, GSM and telefax connections because of unfinished automatisation of data transmittance systems.

It is recommended that the use of internet for presenting prognoses on maps is further developed.

## 5.3 ESTIMATION AND ASSESSMENT OF THE SITUATION

## OBSERVATIONS

TABLE 1. THREAT PHASE N1a

| Country/ authority | Question arrived UTC | Answer issued UTC | Prior contacts | Contents of the answer/basis to it |
|---|---|---|---|---|
| DENMARK/ CCNP | 08.31 | 09.50 | no | Follows the Finnish info about the situation in Loviisa. Info about Danish and Estonian preparedness. Release can take place 10.00 UTC |
| FINLAND/STUK | 08.45 | - | no | No special answer was given. Official info was delivered to foreign authorities: 05.04 UTC aeroplane crash. Lo1 disconnected from the grid, 05.40 ATWS, total blackout, primary system relief valve stuck open. First estimate INES3 upgraded to INES5. Situation serious due to lack of electricity. Noble gases detected in the containment, release expected 10.00 UTC. Preventive evacuation up to 5 km and< 20 km in the wind direction, sheltering of people+animals indoors 5 municipalities, sea traffic east of Porvoo informed about possible release. |
| ICELAND | 08.30 | 09.16 | no | Press release from IVO (at 10.50) forwarded with additional comments. |
| NORWAY | 08.30 | | | Not answered |
| | 09.26 | 10.17 | no but updated info from STUK; DNMI weather prognosis | Question repeated. Answer[1]: The accident seems to be heading towards a release situation. The wind direction is towards south. The Norwegian emergency organization has decided to advise against travelling to the Baltic states. No precautions are necessary in Murmansk |
| SWEDEN/SSI | 08.30 | no answer | | |
| /SKI | 08.30 | 09.33 | no | SKI gave their judgements based on STUK´s info on the possible development of the situation. |

## APPRAISAL AND RECOMMENDATIONS

The answers were given during 1 to 1.5 hours and there was in the answers a strong reliance on the Finnish information. Only SKI/Sweden had the possibility of making in depth technical assessments of the situation, which agreed well with the Finnish

[1]At the time the answer was given the following decisions had already been made:
1. Advice against travelling to Finland, the Baltic states, Belarus and St. Petersburg
2. Norwegians staying in Finland should act according to advise from Finnish authorities
3. Norwegians in the Baltic states and in Russia should stay indoors

assessments. In Norway a technical expert from Institute of Energy Technology participated to assess the

- degree of damage to the reactor
- possible consequences and comparison to the Chernobyl accident
- future development of the situation
- evaluation of the accumulation of hydrogen in the containment and the risk of explosion.

The conclusions gave a fairly realistic picture of the situation.

Weather forecasts, trajectory calculations, forecasts on air mass transport by the meteorological services were similar, for more details see section 5.2. Thus no conflicting information was presented, even if no contacts were taken between the Nordic countries.

Between Finland and Sweden there were regular phone contacts for getting technical information on the plant conditions. These countries also have the necessary technical staff to evaluate this information. Other Nordic countries not using nuclear power have to rely on technical information submitted by official organisations during an emergency situation. In order to interpret, evaluate and explain this technical information to the emergency organisations in these countries we advice the organisations to make available to them specialists in nuclear power plant technology and reactor technology as early as possible in an emergency situation.

It is also important to continue the co-operation between the Nordic and the Baltic countries in all aspects of emergency response.

## OBSERVATIONS

TABLE 2. RELEASE PHASE N1b

| Country/ authority | Question arrived UTC | Answer issued UTC | Prior contacts | Contents of the answer/basis to it |
|---|---|---|---|---|
| DENMARK/ CCNP | 12.01 | 13.18 | no | The course of the events at Loviisa were described in detail since the accident , time the release started (09.25 UTC), the content and magnitude of the release, protective actions taken (evacuation, iodine tablets to persons <18 years in the area close to Loviisa.<br>The forecast calculated by DMI showed trajectories and possible contaminated areas; contamination was given in Bq/m³ |
| FINLAND/STUK | 12.07 | 13.15 | no | Lack of electricity prevents normal cooling of primary and secondary circuits. Reactor core partially uncovered. Severe fuel damage up to 60% of the inventory, containment untight and leaking. High hydrogen content (8%); INES5. Wind from south-west to south-east. The plume moves at 500 m height.<br>Raw materials and animal fodder to be protected in the neighbourhood of Loviisa, iodine tablets to persons <18 y and pregnant women <20 km east of the NPP, sea traffic limitations in the Gulf of Finland east of Porvoo |
| ICELAND | 12.00 | 13.38 | no | Short summary of the situation based on the available information at the time and attached E-mail information from STUK |
| NORWAY | 11.55 | 13.14 | no | Short reply by reference to attached info from STUK on orientation of the development of the accident, releases to air, the meteorological situation and forecast, countermeasures for people living around Loviisa NPP. |
| SWEDEN/SSI | 12.07 | 12.27 | no | The answer was a copy of info from STUK to SSI 11.45, no modifications or explanations done |
| /SKI | 12.07 | 12.54 | no | Updated info on SKIs judgements and possible development of the situation |

## APPRAISAL AND RECOMMENDATIONS

In the answers given within 1 to 1.5 hours strong reliance on the Finnish information again. The meteorological prognoses made in the Nordic countries during the exercise agreed quite well. The emergency organisations (exclusive Finland) based their assessments of the development of the situation and the preparations for response to a large degree on the meteorological prognoses.

## OBSERVATIONS

TABLE 3. PROGNOSES FOR THE NEXT HOURS N1c.

| Country/ authority | Calculations/ Question arrived UTC | Answer issued UTC | Prior contacts | Contents of the answer/basis to it |
|---|---|---|---|---|
| DENMARK/ CCNP | 13.59/ 15.01 | 17.30 | no | The Oslo university calculations were compared with French and UK calculations obtained via IAEA 14.13 UTC. Also Danish calculations were made although the weather data from the Finnish-Baltic area were not available and the total release of iodine not known. They were based on a standard release from a plant somewhat bigger than Loviisa and weather conditions similar to the day and estimated iodine release. The Danish results of the calculations were lower by a factor of 1000 as approximately the French and UK values (provided to WMO/IAEA) as well. This information was sent to the Prime Minister. |
| FINLAND/STUK | 13.03 | 14.30 | no | The answer was prepared to the Prime Minister emphasising that the Oslo university results were over 1000 times bigger than STUK´s results which were based on release data from Loviisa NPP and measurements in the environment. Also Press release was prepared. |
| ICELAND | 15.00 | | no | Not answered before the exercise was terminated |
| NORWAY | 14.57 | (16.00) not sent | no | The answer is in the communication log, not sent to the Prime Minister before the exercise was terminated.<br>At 16.00 discussed and concluded that the calculations are wrong by some orders of magnitude. Calculations were made by NRPA; supported by measurements in Estonia /Narva. |
| SWEDEN/SSI | 14.59 | 15.40 | no | Short answer to government was prepared, saying for Narva 21.00 UTC: max. dose rate outdoors 5 µSv/h<br>max. I-131 concentration in air 10 000 Bq/m³<br>No deposition of Cesium<br>for tomorrow 09.00 UTC: the values will be close to zero |

## APPRAISAL AND RECOMMENDATIONS

The answers were given within 1 to 2.5 hours. No contacts were taken, but all Nordic countries (Iceland did not answer) found, based on their own calculations, that calculations by Oslo university were about three orders of magnitude too high. No contacts between the Nordic countries can be expected in such a matter.

## 5.4 EXCHANGE OF KEY INFORMATION AND THE BALTIC-NORDIC CO-OPERATION

## OBSERVATIONS

TABLE 4. FIRST WRITTEN OFFICIAL INFORMATION SENT OUT FROM STUK/FINLAND REGARDING N2 AND N4

| | Bilateral UTC | IAEA UTC | EU UTC | Received by STUK UTC |
|---|---|---|---|---|
| 1. Notification of an accident/incident | 05.29 | 05.29 | 05.15 | 05.04 |
| 2. Rumours of an accident/incident | - | - | - | - |
| 3. Information on fuel damage | 09.00<br>09.39 detailed | 09.00<br>09.39 detailed | 09.00<br>09.39 detailed | 08.39 |
| 4. Information on a release | 11.32 | 11.32 | 11.32 | 09.57[2] |
| 5. Measured composition of the release | 11.32 | 11.32<br>12.18 detected | 11.32<br>12.20 detected | 09.57 NPP<br>10.17 STUK mobile |
| 6. Message of the magnitude of the release | 11.32 | 11.32<br>12.18 detected | 11.32<br>12.20 detected | 09.57 NPP and<br>10.17 STUK mobile<br>11.03 " "<br>13.40 total release from NPP |
| 7. Message of the termination of the release | 13.47 | 13.47 | 13.47 | 13.05 |
| 8. Message of the off-site countermeasures | 05.55 | 05.55 | 05.55 | 05.26 |

## APPRAISAL AND RECOMMENDATIONS

Different countries obtained the messages via different channels depending on whether they had bilateral agreements with Finland, were EU members or receive accident information on the basis of the IAEA notification convention, to which all these countries are Parties. Finland has bilateral notification agreements with Denmark, Norway, Sweden and Estonia of the participating countries. These countries and Iceland receive official information both directly from Finland and via IAEA. Latvia and Lithuania received official

[2]release started 09.33 UTC

information only via IAEA. Denmark and Sweden, being also EU member states received information via all three channels.

First written official information was sent out from Finland as indicated in table 4. In some cases official information was given also on the phone if requested, which explains some early registrations of official information in other countries.

As can be seen from Table 4 the transmittance of information from STUK forward took about half an hour for messages 1 to 3 and 7 to 8. Regarding the information on the release it took more time because of waiting for more comprehensive information. The evaluators view is that the first message on the release could contain only the starting time and estimate of release (release rate) based on plant conditions. The second message could then contain measurements in the environment and other relevant additional information.

## OBSERVATIONS

TABLE 5. FIRST NOTIFICATION FROM A COMPETENT AUTHORITY ABOUT AN INCIDENT/ACCIDENT N2 AND N4 (1)

| To country/author. | From country/author. | Time UTC | Comm. channel | spont./ requested | content/action |
|---|---|---|---|---|---|
| DK/CCNP | FI/STUK | 05.42-05.45 | fax | spont. | /retransmitted to CCNP |
| DK/DICP | EC/ECURIE | 05.42-05.42 | fax | spont. | /retransmitted to CCNP |
| IS | FI/STUK | 05.55 | fax | spont. | received by Icelandic Coast Guard /forwarded to Geislavarnir at 06.02 UTC |
| NO | FI/STUK | 05.29 | fax | spont. | An ATWS plant emergency declared at Loviisa NPP |
| SE/SSI | FI/STUK | 05.40<br>05.59 | fax<br>fax | spont.<br>spont. | Accident ATWS/<br>INES 3; evacuation <5 km/ |
| Estonia/RPC | FI/STUK | 05.21 | fax | spont. | Accident at Loviisa NPP 05.15 UTC/duty officer informed RPC,RB,ME |
| Latvia/RNSI | IAEA [3] | 06.55 | fax | spont. | Loviisa NPP in emergency status/ transmitted to CDC |
| Lithuania/ VATESI | IAEA | 07.02 | fax | spont. | /transmitted to CSD,EPM,RPC |

## APPRAISAL AND RECOMMENDATIONS

STUK received the first notification of an accident from the Loviisa NPP 05.04, notified EU 05.15, countries with bilateral notification agreements and IAEA were notified 05.29 UTC.

The Nordic countries and Estonia registered having received the message between 05.21 an 05.55 UTC, which seem good and can not be improved very much (taking into account the need to check the information and the priority of alerting the domestic authorities). The bilateral agreements seem to function as intended.

The IAEA channel was somewhat slow in informing Latvia and Lithuania compared e.g. with the EU channel in informing Denmark (see ANNEX 5).

It is recommended that bilateral agreements on the notification of an accident should be extended to other Baltic and Nordic countries as well.

[3] FI/FMI information already 05.45 UTC

## OBSERVATIONS

TABLE 6. FIRST RUMOURS ABOUT AN INCIDENT/ACCIDENT IN FINLAND N2 AND N4 (2).

| To country/author. | From country/author. or organisation | Time UTC | Comm. channel | spont./ requested | content/action |
|---|---|---|---|---|---|
| DK/CCNP | INEX-NEWS Bulletin 1 | 06.23 | fax | | "unspecified incident 05.15 UTC"/not transmitted further |
| IS | INEX-NEWS Bulletin5 | 07.52 | fax | | Coolant leaked Finnish reactor, spurs evacuation |
| NO | INEX-NEWS | 06.32 | fax | | Non-confirmed rumour of an accident at Loviisa NPP |
| SE/SSI | Eko-korr | 06.06 | fax? | | The same as from STUK 05.40 |
| Estonia/RPC | Lithuania/CSD | 07.18 | fax | | Accident at Loviisa NPP (based on INEX-News)/Contacts to Latvia, Lithuania, Russia |
| Latvia/CDC | INEX-NEWS Bulletins 1-4 | 06.20-06.53 | fax | | Telling about accident in Loviisa NPP and countermeasures in the surroundings |
| Lithuania/HS | INEX-NEWS | 06.02 | inet | | /transmitted to CSD |

## APPRAISAL AND RECOMMENDATIONS

It was not clear whether it was planned to spread rumours, no such scripts could be identified. Therefore the evaluation group regarded the media information as "rumours". "The rumours" about an accident reached all countries except Latvia and Lithuania later than the official information. In particular in the case of Lithuania the official information came one hour later via IAEA than the INEX-News (internet) message, which is unsatisfactory at least in case of a severe release nearby. See previous page for recommendation on bilateral agreements.

## OBSERVATIONS

TABLE 7. FIRST **OFFICIAL** INFORMATION ABOUT ESTABLISHED FUEL DAMAGE N2 AND N4 (3).

| To country/author. | From country/author. | Time UTC | Comm. channel | spont./ requested | content/action |
|---|---|---|---|---|---|
| DK/CCNP | FI/STUK<br>EC/ECURIE | 09.16<br>09.19 | fax<br>fax | spont.<br>spont. | Noble gases detected in containment air; release expected 09.30 UTC |
| IS | FI/STUK | 09.05 | fax | spont | Noble gases detected in containment air |
| NO | FI/STUK | 09.48 | fax | spont | Partial core damage, 30% of the core inventory has been released |
| SE/SSI | FI/STUK /<br>SE/SKI verifies | 09.03 | e-mail | spont | Observed damage 08.50 UTC. Verification of core damage having started after a possible phone conversation with STUK |
| Estonia/RPC | FI/IVO | 06.04<br>??? | fax | spont | Reactor cooling lost; reactor likely to suffer damage; possible rad.leaking into environment / weather and dispersion forecasts; decision: 2 counties stay indoors |
| Latvia/CDC<br>/RNSI | FI/IVO<br>IAEA (STUK) | 11.41<br>12.26 | fax<br>fax | spont<br>spont | Fuel damage established /<br>Severe fuel rod damage up to 50% of the inventory |
| Lithuania/CSD | FI/IVO | 09.59<br>? | fax | spont | /Establishing Emergency Management Centre |

## APPRAISAL AND RECOMMENDATIONS

Prognoses of fuel damage in 2 to 3 hours were sent out 07.00 UTC, but information on fuel damage was first sent out from STUK 09.00 UTC, which is 21 minutes after STUK received the information from the NPP. Additional details were sent out 09.39. Information which is critical for further assessments in other countries, such as on the fuel damage, needs to be submitted as soon as possible.

The Nordic countries registered the information between 09.03 and 09.48. Latvia and Lithuania received that information from IVO/Finland between 09.59 and 11.41 UTC, while the IAEA fax on the subject reached Latvia first 12.26 UTC. Again the speed of the direct official information to the Nordic countries was good. Estonia has obviously not registered information on established fuel damage. Via IAEA it took over three hours to get that information, which is unsatisfactory (see ANNEX 5). However, Latvia and Lithuania received information on established fuel damage in 1 to 2 hours time from IVO.

The bilateral information transmittance to the Nordic countries was good. Transmittance via IAEA to Latvia was slow and thus not satisfactory. The failure of bilateral transmittance to Estonia was caused by problems in old analogue phone lines of the receiver, no messages from STUK were received between 8 o'clock am and 4 o'clock pm.

## OBSERVATIONS

TABLE 8. FIRST **OFFICIAL** INFORMATION ABOUT **RELEASE** INTO THE ENVIRONMENT **HAVING STARTED** N2 AND N4 (4).

| To country/author. | From country/author. | Time UTC | Comm. channel | spont. /requ ested | content/action |
|---|---|---|---|---|---|
| DK/CCNP | FI/STUK | 09.25 | phone | reque sted | Conversation between STUK and EXP/CCNP: The release took place through the open valve in the containment with a magnitude of 5500 kBq/s / |
| | | 10.55 | phone | | Release from the containment was measured to be 10 000 kBq/s |
| IS | FI/STUK | 11.39 | fax | spont | Iodine and Noble gas release into the environment |
| NO | FI/STUK | 10.30 | phone | reque sted | Measurements 4 km from NPP; noble gases, iodine and dose rate measurements |
| SE/SSI | FI/STUK | 10.55 | fax | spont | Release of noble gases and iodine-131 [4]/ |
| Estonia/RPC | FI/STUK | c. 12 | fax | spont | Empty faxes arrived |
| | IAEA(STUK) | 11.35 | fax | spont | Release has occurred |
| Latvia/CDC | FI/IVO | 11.41 | fax | spont | Radioactive release into the environment [5] |
| /RNSI | IAEA(STUK) | 12.26 | fax | spont | Releases into the environment have occurred |
| Lithuania/ VATESI | IAEA | 11.32 | fax | spont | ???/Request from HS for weather forecast |

## APPRAISAL AND RECOMMENDATIONS

Release into the environment started 09.33. STUK received that information 09.57 and sent it out 11.32 together with information on the composition of the release and on its magnitude. However the Nordic countries received that information already by phone or fax between 10.30 and 11.30. Information on the release from STUK did not reach Estonia because the faxes were empty. Latvia and Lithuania received release information via IAEA between 11.32 and 12.26. Information from IVO reached Latvia again 45 minutes earlier than via IAEA

Release information is vital for further assessments of the consequences. Therefore information on the release having started should be transmitted immediately and the additional information on its composition and magnitude later as available.

[4]Information only found in SSI's main log.
[5]Information on a small release was noted from an IVO press report 09.10 UTC

## OBSERVATIONS

TABLE 9. FIRST MEASURED COMPOSITION OF THE RELEASE N2 AND N4 (5).

| To country/author. | From country/author. | Time UTC | Comm. channel | spont./ reques ted | content/action |
|---|---|---|---|---|---|
| DK/CCNP | FI/STUK | 11.40 | fax | spont. | Noble gases and iodine / |
| IS | FI/STUK | 11.39 | fax | spont | Iodine and Noble gases have been released into the environment |
| NO | FI/STUK | 11.45 | fax<br>e-mail | spont. | Noble gases and iodine measured<br>Iodine concentrations reported |
| SE/SSI | FI/STUK<br>EC/ECURIE | 10.55<br>12.38 | fax<br>fax | spont<br>spont. | Noble gases and iodine /<br>Activities of I-131, I-133, I-135, Kr-87, Xe-133 were given |
| Estonia/RPC | FI/STUK<br>IAEA (STUK) | 11.35 | fax | spont | Empty faxes<br>*Iodine and noble gases + dose rates measured/* |
| Latvia/CDC<br>/RNSI | FI/IVO<br>IAEA(STUK) | 12.10<br>12.26 | fax<br>fax | spont<br>spont | Noble gases/<br>Iodine and noble gases have been measured in the surroundings of NPP |
| Lithuania/ VATESI | IAEA - ERU | 11.58 | fax? | spont? | Radioact. cloud could reach Lithuania, recommendations for measures |

## APPRAISAL AND RECOMMENDATIONS

Messages on the measured composition of the release into the environment reached the Nordic countries between 10.55 and 11.40 while STUK got that information from the NPP 09.57 and from its own mobile units 10.17.

Via IAEA the information reached Estonia 11.35 and took only somewhat more time to reach Latvia and Lithuania, which is quite good.

The more detailed information on radionuclide concentrations in the environment was sent by STUK 12.20 UTC to IAEA and EU but only EU transmitted it further. STUK had only occasionally the possibility to see the information forwarded by the international agencies and in this particular case an error in numbers was noticed. It should be noted here that there were phone contacts between STUK and the international agencies as well which could cause errors in numbers or units.

The results of the measurements of the composition should be sent to the down wind countries with such a speed that the information is useful for assessments.

## OBSERVATIONS

TABLE 10. FIRST MESSAGE ABOUT THE MAGNITUDE OF THE RELEASE N2 AND N4 (6).

| To country/author. | From country/author. | Time UTC | Comm. channel | spont./ requested | content/action |
|---|---|---|---|---|---|
| DK/CCNP | IAEA(STUK) | 11.59 | fax | spont. | Reference to phone communications from STUK 09.00 and 09.40 UTC. 50% noble gases measured inside the containment, if containment fails 15xE12 Bq/s noble gases would be released. Off site measurements at 4 km down wind 300 µSv/h; confirms actual release. Iodine 8 000 Bq/m³ at 5 km from NPP |
| | FI/STUK | 12.02 | fax | spont | |
| IS | FI/IVO | 12.09 | fax | spont | 10 TBq/s of radioactive substances mainly Noble gases |
| NO | FI/STUK | 11.45 | fax e-mail | spont | Dose rates and iodine concentrations reported |
| SE/SSI | FI/STUK | 11.46 | fax | spont | 10 TBq/s of noble gases and iodine-131 / |
| Estonia/RPC | FI/STUK IAEA (STUK) | 11.35 | fax | spont | Empty faxes Dose rates of 0.3-0.4 mSv/h at a few km from the NPP/ |
| Latvia/RNSI | IAEA(STUK) | 12.26 | fax | spont | Iodine concentrations up to 8 000 Bq/m³ have been measured at the distance of 5 km from the plant |
| Lithuania/ VATESI | IAEA - ERU | 15.58 | fax | spont | ????? |

## APPRAISAL AND RECOMMENDATIONS

The evaluation group interpreted that the message the planning group was after can be answered both by release rate per radionuclide and off-site dose rate or activity concentration measurements and did not mean the total release estimate, which can only be made after the release has stopped.

Such information was sent out from STUK 11.32 based on information from the NPP 09.57 UTC. To IAEA and EU further information was sent 12.18 and 12.20 respectively based on the measurements by STUK´s mobile units 10.17 and 11.03 UTC. The Nordic countries and Estonia received the message between 11.35 and 12.09. Latvia received from IAEA the information 12.26 and Lithuania 15.58. The latter was surprisingly late except if it is based on the 13.40 estimate by the NPP of the total release (see ANNEX 5).

The answers in Table 10 reflect the fact that information on the magnitude of the release presented some difficulties. Information received via/from different sources e.g. in Sweden was compared in detail with the information available at (possible to be transmitted per phone) and reported in written form by STUK to IAEA and EU. The comparison revealed that the content of the information had changed somewhat on its way to the receiver.

The various ways interpreted to indicate the magnitude of the release originate probably from the various purposes to assess the magnitude before the release has stopped.

1. For the INES classification purpose STUK used measured Noble gas and Iodine activities and dose rates in the containment.
2. Release rates and total releases into the environment before certain points in time were also reported.
3. For the purpose of assessing doses to people STUK used initially, in the morning before the release, conservative estimates of the Iodines and other nuclides potentially released from the core inventory into the environment.
4. Activity concentrations of three iodine-isotopes, Krypton-87 and Xe-133 and dose rates were measured in the environment close to the NPP and reported to confirm the releases and improve the dose estimates.

It seems that the nuclides and units were not always transmitted properly causing in the emergency organisations confusion regarding the magnitude of the release for radiation protection purposes. There were numerous phone calls on this subject, which might have caused misunderstandings.

It is therefore recommended that in giving or forwarding release information the nuclides and units are carefully checked and the measurement times are properly specified. Oral information should rather be confirmed in writing. Conservative assumptions, information based on calculations and measurements should be clearly separated.

## OBSERVATIONS

TABLE 11. FIRST MESSAGE ABOUT THE RELEASE HAVING STOPPED N2 AND N4 (7).

| To country/author. | From country/author. | Time UTC | Comm. channel | spont./ reques ted | content/action |
|---|---|---|---|---|---|
| DK/CCNP | EC/ECURIE | 13.42 | telex | spont. | Release ceased 13.00 UTC; total estimate of iodine released 10 - 1000 TBq/ |
| IS | FI/STUK | 13.52 | fax | spont | The containment is now leak tight and off-site releases have stopped/ |
| NO | FI/STUK | 13.48 | fax | spont | The containment is now leak tight and off-site releases have stopped |
| SE/SSI | EC/ECURIE | 13.39 | fax | spont | 13.00 UTC release is over/ |
| Estonia/RPC | IAEA | 15.38 | fax | spont | The reactor is under full control/ |
| Latvia/CDC | IAEA(STUK)[6] | 15.34 | fax | spont | The reactor is now under control. The release has stopped / |
| Lithuania/HS | ??? | 15.47 | fax | spont | ?????/ |

## APPRAISAL AND RECOMMENDATIONS

STUK has registered the termination of the release at 13.05. The written message about the termination of the release was sent out from STUK 13.47 UTC. The EC/ECURIE message reached Denmark and Sweden already 13.42 and 13.39 respectively, which means that a phone message came prior to the written message from STUK to EU. STUK sent this information quickly which is good as it can have health implications.

Why the written messages via IAEA reached the Baltic countries first after 15.00 UTC is not clear; and it is unsatisfactory.

[6]Latvia got regularly information first from INEX-NEWS

## OBSERVATIONS

TABLE 12. FIRST OFFICIAL MESSAGE ABOUT OFF-SITE COUNTERMEASURES N2 AND N4 (8).
(both in Finland and in your own country)

| To country/author. | From country/author. | Time UTC | Comm. channel | spont./ requested | content/action |
|---|---|---|---|---|---|
| DK/CCNP | FI/STUK | 06.08 | fax | spont. | Preventive evacuation up to 5 km from NPP/ |
| IS | FI/STUK | 06.02 | fax | spont | Preventive evacuation up to 5 km from NPP |
| NO | FI/STUK | 05.55 | fax | spont | Preventive evacuation up to 5 km from NPP |
| SE/SSI | FI/STUK | 05.59 | fax | spont | Preventive evacuation up to 5 km from NPP/ |
| Estonia/RPC | IAEA (STUK) | 06.12 | fax | spont | Preventive evacuation up to 5 km from NPP/ |
| Latvia/CDC | IAEA (STUK) | 07.24 | fax | spont | Evacuation began within a radius of 5 km from NPP |
| Lithuania/HS | FI/STUK? INEX-NEWS ?? | 11.04 | inet | | ?????/ |

## APPRAISAL AND RECOMMENDATIONS

It was not clear whether the planning group expected both the countermeasures in the accident country and elsewhere to be looked at. Only those in Finland are listed here. Information of the implementation of countermeasures reached the Nordic countries around 06.00 UTC and Estonia some minutes past six, while STUK had received the information 05.26 and distributed it 05.55 UTC, which is good.

Why is there more than one hours difference between information coming to Estonia and Latvia via IAEA and why has Lithuania not received the information from IAEA. This needs to be explored.

Regarding the Baltic countries, problems with communication facilities were observed as well as of identifying "key information" from the logs. The latter may be because this type of information was not necessarily key information from their view point.
Such factors could possibly explain some of the differences between the Nordic and the Baltic countries besides the differences in experience.

## OBSERVATIONS REGARDING THE CONTACTS BETWEEN THE NORDIC COUNTRIES

The number of contacts (excluding the meteorological information and the regular numbered message series from STUK) between the Nordic countries was of the order of 15 to 25 from and to Finland except regarding Iceland (3). Between the other Nordic countries from 5 to 10.

The contacts concerned mainly
- additional information from Finland about the situation at the NPP and the release,
- travel restrictions
- assistance to Estonia.

## APPRAISAL AND RECOMMENDATIONS

The regular reports were sent mainly by fax. E-mail was used increasingly for questions and answers and is expected to increase in future. The speed of the different communication means should be assessed taking also into account the delays inside the countries.

Logs may have legal implications and not only assist in evaluation of the exercise. Therefore the logs should be developed to cover better all the means of communication in the best way. There should be co-operation while developing the logging procedures.

## OBSERVATIONS REGARDING THE CONTACTS BETWEEN THE BALTIC COUNTRIES

TABLE 13. NUMBER OF BALTIC CONTACTS (EITHER DIRECTION)
(excluding meteorological information)

| | Registered in ESTONIA | | | | LATVIA | | | | LITHUANIA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | fax | e-mail | phone | other | total | fax | e-mail | phone | other | total | fax | e-mail | phone | other | total |
| ESTONIA | | | | | | 8 | 2 | 2 | | 12 | | | | | |
| LATVIA | 8 | 2 | 2 | | 12 | | | | | | | | | | |
| LITHUANIA | 10 | | | | 10 | 0 | | 2 | | 2 | | | | | |

## APPRAISAL AND RECOMMENDATIONS

The contacts mainly concerned the
- emergency management arrangements
- forecasts of the plume movement
- monitoring data
- informing or asking about countermeasures implemented.

Estonia - Latvia co-operation was satisfactory but co-operation with Lithuania was not. There is great need to improve co-operation between the emergency organisations in particular with that of Lithuania. Also contacts between all the corresponding authorities from each country need to be improved.

## OBSERVATIONS REGARDING THE BALTIC-NORDIC CONTACTS

The contacts (excluding the meteorological information) between the Nordic and the Baltic countries were of the order of 5 between each pair of countries, except Finland who had somewhat more with Estonia and no contacts with Lithuania. Iceland only had contacts with Estonia of the Baltic countries.

Telefax was the most used communication channel. There are large differences between the countries in registering their contacts with each other, which is not unexpected. The contacts concerned primarily

- the readiness of the emergency organisation
- countermeasures implemented or likely to be needed in the Baltic countries
- assistance to Estonia
- information on the situation in Finland
- air concentration, deposition and risk forecasts in the Baltic countries.

## APPRAISAL AND RECOMMENDATIONS

Estonia did not receive any information directly from STUK from 8.00 am to 4.00 pm UTC. Iceland helped by providing missing information from STUK to Estonia. Special pages were set up on Geislavarnirs World Wide Web server in Iceland with copies of the information provided by STUK. Accessing this Icelandic mirror site was much easier for Estonia than accessing the original overloaded Finnish site. STUK´s logs show that three faxes between 5.25 and 7.30 am UTC reached Estonia, between 8.15 and 9.00 the lines were busy, the fate of the faxes in the afternoon could not be confirmed. Although about 80 messages, mainly faxes were received in Estonia during the exercise the fax in RPC had disturbances due to poor quality of the old analogue phone lines.
The Estonian E-mail was overloaded in the beginning of the exercise as well but started functioning in the afternoon.

The need for different types of communication channels needs to be looked at. Sufficient number of faxes (minimum one for receiving and one for sending per organisation) is vital for communication.

It is clear from the logs in different countries that they need to be improved. Contacts concerning key issues need to be well documented. Important messages need to be confirmed in writing, if originally discussed on the phone.

## 5.5 CO-ORDINATION OF RECOMMENDATIONS

## OBSERVATIONS

TABLE 14. THE NOKIA MEETING; SHOULD WE CANCEL THE MEETING? N3a.

| Country/ authority | Question arrived UTC | Answer issued UTC | Prior contacts | Contents of the answer/basis to it |
|---|---|---|---|---|
| DENMARK/ CCNP | 08.47<br>09.40 | no answ.<br>11.23 | no | Repeted request; answer: Not advisable to go to the meeting in Porvoo[7] |
| FINLAND/STUK | 11.42 | 11.58 | no | No reason to cancel the meeting.If the situation becomes worse, STUK informs media+rescue authorities |
| ICELAND | 08.29 | <08.45 | no | Refer question to NOKIA in Helsinki and ask them to seek advise from Finnish authorities |
| NORWAY | 08.30<br>10.30 | no answ.<br>10.30 | no | Renewed request by phone. Answer:<br>1. Too early to give a definite answer<br>2. Nokia must contact Finnish authorities for further information |
| SWEDEN/SSI | 08.34 | 12.39 | no | Referred to the statement by the Finnish rad. prot. authorities: no reason to cancel trips to areas outside the wind direction. |

## APPRAISAL AND RECOMMENDATIONS

The evaluators suspect that this kind of questions do not call for co-operation.

Regarding recommendations concerning travel to and in Finland the Nordic countries mainly followed the written Finnish advise. No prior contacts were taken, which could have helped as the EU message had misinterpreted the original Finnish information and caused Denmark to depart from the advise given by the other Nordic countries.

The answering times varied between 15 min to 4 hours after the questions arrived between 08.00 and 09.00UTC, except for Finland, which by mistake received the question first 11.42, but then answered immediately.

[7]The advise to Nokia seems to be based on the following: press release from STUK (Bull.No2), which talks about "sheltering up to approximately 50 km **east** of Loviisa" , and an EC message somewhat later talking about "within a **radius** of 50 km" confusing the issue as Porvoo is inside the 50 km radius but west of Loviisa.

## OBSERVATIONS

TABLE 15. SHOULD ANY FLIGHTS CROSSING THE AFFECTED AREA BE RE-SCHEDULED? WHAT DO WE TELL TO THE ANXIOUS PASSENGERS ? N3b.

| Country/ authority | Question arrived UTC | Answer issued UTC | Prior contacts | Contents of the answer/basis to it |
|---|---|---|---|---|
| DENMARK/ CCNP | 11.46 | 13.08 | no | Flying over affected areas could take place according to the air authorities in Finland, Baltic countries, Russia. Danish authorities not issued travel restrictions >50 km from NPP; follow instructions by local authorities (cf. the remark on N3a). |
| FINLAND/STUK | 11.46 | 12.07 | no | Flying between Helsinki-Tallin, Helsinki-St.Petersburg is safe, no radioactivity above 1.5 km. The answer was sent to air traffic control. |
| ICELAND | 11.44 | 12.07 | no | Should be OK to fly over affected area but contact air authorities in Finland |
| NORWAY | 11.45 | 14.42 | no | Telephone call to air control org. Safe to fly over Finland at high altitude |
| SWEDEN/SSI | 11.44 | no answ. | no | SAS itself cancelled flights to Southern Finland (SAS had information from SSI 08.40 about the accident) |

## APPRAISAL AND RECOMMENDATIONS

The answering times varied between 15 min to 3 hours. Denmark contacted STUK 11.23 on travelling in Finland and they were answered 12.08 informing about restrictions in boat traffic and recommendations to avoid road traffic on the coast east of Loviisa.

The air companies are not likely to ask the question of possibilities to fly but rather that will be done by the authorities who control the air traffic (In Denmark e.g. ATS) or information is automatically sent to them. This may have been confusing to the players. With no prior contacts between the Nordic countries the reactions vary, although not the view of the emergency organisations.

The importance of actual correct organisations to be simulated in the exercises is again emphasised.

## OBSERVATIONS

TABLE 16. IS IT SAFE TO TRAVEL TO HELSINKI TO NIGHT? WE HAVE A GUEST PLAY THERE N3c.

| Country/ authority | Question arrived UTC | Answer issued UTC | Prior contacts | Contents of the answer/basis to it |
|---|---|---|---|---|
| DENMARK/ CCNP | 14.29 | 15.13 | no | Danish authorities have not issued restrictions on travelling to Finland, follow recommendations given by local authorities. Helsinki is outside the possibly contaminated area. No risk of exposure. |
| FINLAND/STUK | 14.35 | 14.52 | no | No need to postpone the trip, the present view is that it is safe to travel to Helsinki, the release has stopped. |
| ICELAND | 14.30 | 14.56 | no | No need to postpone the trip. Latest information is that the release has stopped. |
| NORWAY | 14.30 | 16.25 | no | Norwegian citizens are advised not to travel to Finland at the moment |
| SWEDEN/SSI | 14.38 | 14.49 | no | Reference to the statement by the Finnish rad.prot.authorities, that no reason to cancel trips to areas outside the wind direction from the NPP. |

## APPRAISAL AND RECOMMENDATIONS

The answering time varied from 10 minutes to 2 hours. The answers were similar (not to cancel trips to Helsinki) in Denmark, Finland, Iceland and Sweden without prior contacts, while in Norway the citizens were advised not to travel to Finland. In Norway the reason may be because there was an earlier decision to this effect. Norway tried to make Nordic contacts without success before making decision.

## 5.6 JOURNALISTIC REPORTING BACK TO NATIONAL MEDIA IN THEIR HOME COUNTRIES

A Report and Evaluation of Media Conditions and Coverage during the International Nuclear Exercise of 1997 - a Nordic Perspective
By Erik Lund and Jette Drachmann Søllinge

### 5.6.1 Introduction

This exposition reports on experience gathered as to the role of the media in the exercise. The co-ordinating authorities planned testing and developing the dissemination of information to the media and hence to the public. Towards this end media activities were simulated by teams of students and professionals in the field.

Further, a series of recommendations are formulated on the basis of the experiences from the exercise. The very few specific recommendations relating to another exercise or a real-life accident in Finland are integrated in the report text.

### 5.6.2 Material bases for this part of the evaluation report

The correspondents in Helsinki and in the national centres of communication prepared series of news reports as if for distribution. These written reports - including manuscripts for radio broadcasts - are used here and supplemented by observations of and discussions with (by Erik Lund) participating editors and journalists during and after the exercise. Some series of news reports are incomplete, however. Other, non-written, material is not exploited by reason of its unavailability. Because an important part of the observation took place at the Danish centre of crisis reporting (the Bernstorff bunker), Danish perspectives have a certain predominance in the examples employed in the report's empirical basis.

### 5.6.3 The journalistic levels

The journalistic part of the exercise was carried out on three levels:

a) A simulated international news agency operated in Finland and issued identical news bulletins in English to all countries involved in the exercise, primarily based on bulletins issued by Finnish authorities.

b) The Nordic states had special correspondents in Helsinki, reporting from the STUK - the Finnish Centre for Radiation Safety - and the Finnish Home Office, primarily taking their starting point in a series of Finnish press conferences. It was an integral part of the exercise concept that the visiting correspondents would operate in the Helsinki region only, Finland outside the capital being "off limits".

c) In each of the Nordic countries, teams of reporters worked on distributing news to their respective publics, supplementing the reports from Helsinki in the

perspective of local concerns. So, Danish reporters specialising in war and catastrophe reporting worked in the press room of the Bernstorff bunker. From there they had free access to interviewing Danish experts on developments in Finland and to work out a Danish angle in their reports to Ritzaus Bureau (the Danish news agency) and the Radio Denmark news bulletins, based on input from both the international news agency and the Danish reporter in Helsinki.

### 5.6.4 The series of news reports

The Finnish-language series of news reports - prepared by the simulated news agency - is characterised by many, detailed reports at short intervals of time and dominated by local concerns of such concrete matters as evacuation and levels of radioactivity. The main sources are local authorities.

The "international" version in English - composed by students at Tampere University - is also very detailed and dominated by concrete events and measures; this, too, is characterised by short intervals and is mainly based on information from a number of relevant authorities. Although most of the news items are "hard news", there is also one rather long item of reporting on the victims' lot (news as identification).

The Swedish-language Finnish version is very much alike to the two already mentioned and uses the same range of sources, but is characterised by somewhat shorter items.

The Swedish Helsinki-version - by a Swedish correspondent in Helsinki - is dominated by rather short reports of hard facts, short intervals of time, and a predominant reliance on information from the Finnish authorities.

The national Swedish version - by the national news agency TT (Tidningarnas Telegrambyrå) and made as a series of radio news flashes at regular one-hour intervals (standard broadcast times) plus imagined newspaper contents bills - is detailed and based on a somewhat wider array of sources, especially Swedish experts. Consequences for neighbouring countries are prominent, including those to Sweden, in the shape of potential risk of receiving radioactivity by air or by ships arriving at Swedish ports from contaminated areas. Here, comparisons with other nuclear accidents are used to some effect, namely Harrisburg and Tjernobyl.

The Norwegian version - by a correspondent in Helsinki - is also a blow-by-blow piece of reporting: Many reports at short intervals and furnishing many details. Here, however, other types of sources are employed, early items report rumours occasioned by dearth of reliable information, and drama - for instance mass flight - is prevalent. Also, consequences to neighbouring countries are very much in focus, as are the same comparisons as in the former series.

The Danish Helsinki-version from a correspondent is factual and following events as they are becoming known, but rather less detailed than the Norwegian one and mainly based on information given by the Finnish authorities and experts.

The Danish national version prepared by the Ritzaus Bureau (the news agency) is a close following of events combined with a marked focus on technical explanations and -

especially - on interviews with Danish experts and spokesmen from the Danish Emergency Management Agency, mainly on reactor technology and the chances of radioactivity hitting Denmark through changes in wind direction. Both Danish versions employ the comparisons with Harrisburg and Tjernobyl, but not in very prominent positions.

The Icelandic version by a correspondent in Helsinki is characterised by rather few reports at long intervals of time, giving few details except for defining the levels of radioactivity and local levels of background radiation that are compared to the Icelandic standard.

### 5.6.5 Systematic differences in reporting

Differences are easily discernible in the kinds of reporting originating with journalists and news agencies of different nationality. The most important factors are geographical distance, the informational distance, time, and the language barriers. Also, the perceived credibility of executive authorities or accident managements differ somewhat.

A Geographical distance

The Finnish reports are consistently the most concise, correct, and detailed. Also, the reporting here is continuous and systematically updated. The short distance from Loviisa to Helsinki necessitates this from practical considerations and civil responsibility. Authorities' information and practical measures are communicated "unedited".

No further away than Sweden on the other side of the Gulf of Bothnia events are at such a distance, that reporters can afford to analyse information from Finland in a more independent way, introducing a critical view on events and authorities in Finland in addition to national concerns about radiation levels affecting Sweden. In general, information is processed by the news agency in a markedly "medialized" way, usual news criteria of the media taking precedence.

Norwegians and Danes exhibit more or less the same reporting structure: Geographical distance to Loviisa is further enlarged. Correspondingly, possibilities of introducing journalistic perspectives on the event - dimensioning it in media-defined terms - are much wider. This means less pressure on reporters to communicate all details immediately, or to communicate all details on principle: Some may be completely excluded, others only included in contexts where they serve a perspectivizing function.

Iceland is markedly at the greatest distance. This manifests itself in the lower periodicity of reporting, the much smaller number of details and lower levels of information in general in this series of reports.

B Informational distance

The informational distance - or the information gap - is evident between on the one hand Finland and Sweden, and on the other Norway, Denmark and Iceland. The two former countries both have had nuclear power industry for decades and so have a markedly

higher level of public information on nuclear power. This leads to a higher level of understanding and the reporters' assumptions of the public's understanding of the accident's character, scope and consequences - compared to the situation in the other three countries, excepting the northern parts of Norway, where the proximity of the nuclear power plants of the Kola Peninsula has rendered North Norway a regional "knowledge power" on nuclear matters.

An example of the effect of this generally inferior level of knowledge on nuclear power, reactor typology, and other technically complicated matters was the initial misinformation on the reactor type at Loviisa in the Danish radio news broadcasts.

## C The time factor or differences

The time factor did not constitute a systematic problem in any of the series of reporting to the Nordic countries. All reported in real time, although with some nuances: Finland, followed by Sweden, was closest to reporting continuously in real time, and Iceland was farthest from this manner of reporting.

A more detailed report on this factor requires details and observations from the national centres, and in this respect only the Danish centre was followed closely. The representativity of the following observations from the Bernstorff bunker is unknown.

During the exercise, the time factor was considered with great attention. Specific interest was centred on which channels were the fastest to send information on developments in Finland to Denmark. The bulletins of the Finnish authorities were quickly transmitted to relevant Danish authorities in accordance with agreements on reciprocal warning.

Nevertheless, the authorities and the experts present in the Bernstorff bunker had difficulties in being ahead of the journalists with fresh information from Helsinki. Several times during the exercise, the reporters of Radio Denmark's news service and Ritzaus Bureau wanted to interview Danish experts on a development, on which they had been briefed by the reporter in Helsinki or informed of through the international news agency.

This caused Danish experts to make statements on circumstances, of which they had knowledge exclusively through the media. This resulted in occasional uncertainties in communication.

The experts made heavily marked reservations towards information they had through the media only. And the journalists grew suspicious, when they found that the Danish experts were less updated on recent developments than they were themselves.

In a real crisis it will be important that the authorities' bulletins are transmitted at least as fast as media-transmitted information.

## D The language barriers

Whereas the languages of Sweden, Norway, and Denmark plus the Swedish-spoken but quite small part of the Finnish population are related and do not present serious problems

of mutual understanding, and the language of Iceland is no more different than to make the use of a dictionary and some good will a feasible option - the Finnish language is quite another matter, being totally unintelligible to the rest of the Nordic populations. The solution to this problem has been the adoption of English as a common language of communication on occasions where no Swedish-spoken Finnish representative has been present.

Some of the Nordic correspondents in Helsinki complained of insufficient interpreter service on the part of Finnish authorities. Here again, the Danish experience may serve as an example:

The Danish reporter in Helsinki met with a belated and incomplete translation from Finnish to English of briefings in the capital. Not till the final stages of the exercise were optimum working conditions created for visiting journalists.

In a real crisis the insufficient state of preparation as to English-language information during the initial phases would have resulted in journalistic resentment against the Finnish authorities. This would have led to co-operation problems between the authorities and the media.

Too many press releases were in Finnish. The Swedish/English translations did not reach the Danish reporter earlier than four hours after their appearance in Finnish. If the library of STUK is to be used as a press centre in possible crises, it will be a further advantage if loudspeaker information is given in other languages than Finnish.

E The credibility of informants in general and authorities in particular

As to this aspect, there is only material available from the correspondents in Helsinki and the national news agencies in other countries than Finland. For the Finnish journalists, credibility has obviously not been a problem: The authorities and experts are reported without reservations. To varying degrees the credibility of experts and authorities are questioned by others, especially by the correspondent from Sweden and by the Swedish news agency.

The Swedish correspondent raises the question of the reliability and impartiality of the STUK spokesman. The Swedish news agency raises the question of the competence of the (Swedish) authorities involved. In Denmark, there was the formerly mentioned problem of the experts' competence caused by belated information.

These - rather few - instances of reduced credibility point to the problems of information lags and language barriers as the causes, cf. above.

### 5.6.6 Evaluation of the level of the exercise

On this and the two following aspects there is only material available from the Danish national part of the exercise.

Among the editors involved and the participating journalists from news rooms of the radio news service of Radio Denmark and the Ritzaus Bureau (the Danish news agency) there was widespread satisfaction with the fact that the INEX-2-FIN was conducted on a level making it interesting and journalistically challenging both to the corresponding reporter stationed in Helsinki and to the Danish journalists in the press room of the Bernstorff bunker situated in a Copenhagen suburb.

This journalistic satisfaction was spontaneously expressed at an early stage in the course of the exercise, resulting from the pleasant surprise to the journalists who were comparing this to the earlier exercise INEX-2-CH of 1996 which had been conducted on a much too low level, only implying the possibility of routine reporting. This preceding exercise had been a static operation on level 1. In contrast, the INEX-2-FIN was conducted on varying levels up to level 5.

These levels reflect the commonly agreed scale from 1 to 7 in the grading of atomic accidents, the Three Mile Island emission in 1979 being on level 5 and the Tjernobyl disaster in 1986 being on level 7.

As a consequence, in 1997 the Danish journalists partook as a matter of course in the whole operation in the Bernstorff bunker. In 1996 it had been impossible to induce them to stay in the bunker. Which in a sense was quite in accordance with journalistic behaviour in the circumstances of a real course of events on an equivalent level: An accident on level 1 would not keep the journalists "in the field". They would soon make their way back to their news rooms from lack of meaningful employment.

### 5.6.7 A high level confers prestige

Nuclear power plants do not suffer a loss of prestige in the press through hosting simulated accidents of a serious nature. Even though the constant policy of these power plants towards the media has been that such catastrophes cannot happen in real life.

Journalists perceive it as an expression of a security "surplus" that nuclear power plants can afford to place themselves at the disposal of exercise procedures relating to events expressly defined as quite improbable.

Rather, it inspires suspicion of reluctance on the part of the power plants to take the exercises seriously, if they are conducted on so low a level as the INEX-2-CH.

### 5.6.8 Geographical limitations

It seemed unrealistic to Danish reporters that the exercise was carried out exclusively in Helsinki. In real life the journalists would have fought for the taxies already at the airport at Vantaa and raced for the power plant at Loviisa.

At Loviisa they would have experienced the realities of bilinguality - in the case of authorities as well as rescue forces. This would have eased the work of the Nordic reporters to an appreciable degree. Moreover, they would have experienced the visible

presence of rescue forces in the town of Loviisa, for instance measuring radioactivity in the town.

### 5.6.9 Scarcity of maps and graphics

On this aspect more or less identical views are expressed by the Swedish correspondent in Helsinki and the participants in the Bernstorff bunker: Maps of the place of accident being produced as early as possible is important - overview maps as well as more detailed ones.

In early bulletins on the accident at Loviisa, the town was presented as if it were a suburb to Helsinki - the distance between the two towns is 50 miles, in fact. Also, the situation of the Loviisa power plant on a small island, Hästholmen, outside the town was not correctly described until at a relatively late stage.

The reporter in Helsinki telefaxed country and town maps to the press room in the Bernstorff bunker in order to create a "common ground" for the description of the news developments. In the same way, the reporter telefaxed information graphics on the Loviisa plant to the journalists in the Bernstorff bunker - not until both maps and graphics were available was it possible to cancel the distance between the correspondent in Helsinki and the journalists in Copenhagen. With identical maps and graphics available in the two capitals it became possible to talk without difficulties about localities and processes in correct terms.

Generally, too little documentation was distributed in the shape of graphics, tables, drawings, and photos after the press conferences in Helsinki. The Danish reporter really missed a drawing of reactor 1 - it only appeared in a copy at the late press conference at 6 o'clock p.m.

### 5.6.10 Information on other agencies

The Danish reporter also missed a clearer picture of the participants in the exercise and their telephone numbers. In a realistic situation he would use the WHO earlier than here, for instance. But it was almost by chance that he discovered that WHO was a participant in the exercise.

From journalistic quarters a general wish has been stated to employ environment organisations as partners in exercises. In a real crisis situation these would volunteer supplementary and/or corrective information. In order to test the validity of their often alternative versions it is important that they can be tested by Danish experts, typically "authorised" experts, directly at the disposal of the press in the Bernstorff bunker.

### 5.6.11 Recommendations

The pressure of news on all news rooms has intensified. A journalistic reflex in the news media, and especially the electronic media, is to get as close as possible to communicating in real time. In commercial media this is desirable from motives of

competition - in public service-media from a motive of serving the public with information, but also from fear of losing the audience to commercial channels. Most print media, especially in Northern Europe, have a long tradition akin to that of public service radio and television.

This growing competition results in shortened time available for editorial planning and work both in general and in the specific situation on the levels of the individual journalist and that of the individual editorial unit.

## A The risks of role confusion and a proposed solution

It is important to avoid confusion of the operative and journalistic activities in crises. The operative management will be too occupied by the real chain of events to afford reserving time for the servicing of journalists during the phases of warning and immediate emergency. And journalists will have a short deadline or be broadcasting in real time with resulting inflexible demands of finding persons able, willing and permitted to make statements.

A sound solution to this problem is to keep the operative management clear of direct contributions to communicating the accident during the early phases. In return, representatives - trained press officers if possible - understanding both the subject matter and the working conditions of the media, must be appointed the task of interpreting and communicating the early pieces of information. This does not mean that they in any way usurp the roles of the journalists or supplant them in the face of the public, but that they are able to dimension the development of news and its consequences in the short as well as the longer perspective.

The main objective is not to substitute press officers for journalists but to put press officers at the disposal of the media - on the premises of the media, regarding the aspects of communication and structuring of news.

## B A worst-case scenario

The worst possible scenario is that of the reporters, the editors, and the public getting the impression of something being hidden. It is all-important in situations of warning and immediate danger to make the process of news communication to continue in ways as normal as possible, regarding form as well as contents, employing well-known journalistic voices and faces as key contributors. Any deviance from the norm in the communication process itself will be noticed by the public, perceived with distrust and so possibly trigger panics.

This stresses the importance of experts familiar with translating experts' language into standard language and able to oblige the journalists with translations of complicated professional terms in a way both credible and comprehensible.

It would be quite irresponsible to let the operative management concentrate on the necessary effort without placing other experts at the disposal of the media of communication. In the case of a serious nuclear accident two or three days may pass

before an operative manager will have the time to speak to the media, and this is too long to wait for both the media and the public.

Letting journalistic access to experts wait so long is the same thing as inviting a flood of rumours, probably initiated by the less knowledgeable and at the best least updated sources. Such a flow of rumours will be difficult or impossible to catch up with, let alone to overtake, through later releases of more qualified information.

## C Continuous and qualified information access in a centralised system

It is important from an early stage to ensure continuous access for the media to qualified and central sources - or to qualified interpreters of such sources. The factual arrangement of such a procedure must vary from one country to another, depending on the placing and competence of sources.

In Denmark, where many key sources will be convened in one place - in the Bernstorff bunker - it is possible in a short span of time to provide a quite wide spectrum of source statements, from experts on radiation, over meteorological experts to experts on foodstuffs. All by reason of a chief of information whose task it is to be the "liaison officer" between experts and the press, inclusive of assessing what types of experts will be the most needed by the media at varying stages. Judging from experience gathered through the exercise it will be possible to withdraw experts involved in operative tasks from these tasks for shorter spans of time - when the media will be in special need of the expertise in question - and so give at least key journalists a chance of interviews with these experts without "filters".

## D Access in a decentralised system - and an evaluation of the two systems in terms of reporting

This task of securing access to qualified sources for the media is somewhat more difficult in countries featuring a decentralised model of crisis management. Here - as in the concrete example of Finland - the sources will be scattered over several institutions throughout the metropolitan area. The experts of STUK itself, those of the Ministry of the Interior, of the police, of the fire- and ambulance brigades and of the meteorological service will at best be available during very short spans of time and only through the deployment of a large number of reporters. And to move a sufficient number of reporters to so many places in time and at the same time co-ordinate their activities technically and as to journalistic contents will demand a strengthening of editorial structure which may be considered unrealistic in the short run.

The technology of radio and television reporting has been simplified, but still experience from unexpected major events show clearly that some hours elapse before these media are able to report at optimum level.

In all probability, the "Danish model" - of collecting a large number of experts in one place and giving at least reporters from the Ritzaus Bureau and the radio news service of Radio Denmark access to these experts during pauses in their main work - is preferable during the stages of warning and immediate emergency.

At stages of follow-up the experts will have left the Bernstorff bunker and have changed into the usual "decentral experts" within their respective fields. During these phases the journalists may start using the experts in new and more independent ways and introducing the critical aspects they did not have the time for during the more hectic phases of immediate danger.

## E The journalists and the phases of crisis

It is important that the journalists understand within which of the various phases of warning, immediate emergency and follow-up they operate - and which reporting tasks are possible and meaningful at the different stages. Only then are they able to put the right questions at the right moments - a first prerequisite to obtain credible and intelligent answers.

The critical dimension in journalism needs not be suppressed through close contact with experts during the stages of warning and emergency. But it cannot be given full expression till the stages of follow-up: Because other considerations - not least that of saving human lives - must be given priority at the initial stages.

## F The role of newspapers

As the exercise lasted 12 hours, it was unrealistic to involve print media. Radio and television are ephemeral and newspaper coverage is important to public comprehension of a crisis' character.

In longer exercises the elaboration and continued coverage of the newspapers are decisive as to popular reactions. In this way it is also possible to test how far normal news structures may be maintained in a crisis. One prerequisite of a normal news structure is the participation of newspapers, elaborating and following up on the short items from news agencies, radio, and television.

The form of this elaboration is important. Newspapers tend to print side stories and neglect the main story, assuming this to be well-known from radio and television. But both ensuring that the collective media audience is informed and making the side issues comprehensive requires inclusion of the main story in the papers.

To a large extent the first transmissions from the news agencies set the agenda and the level for the other media, especially for the newspapers. These first messages are decisive in determining whether the result is chaos or controllable reactions throughout the public.

## G Analysis of media coverage

As noted above there were certain lacunae in the material available to the present analysis. This aspect of the exercises would benefit from a more systematic collection of

media products and the immediate reactions of the editors and journalists involved. Towards this end a plan might be discussed and adopted before the next exercise.

Such a plan should relate to the question of types of material to be gathered, to what extent and where or by whom. The main relevant types of material are the written news agency items, tapes of radio and television broadcasts, and responses from journalistic participants. These last may be systematically gathered through questionnaires and/or interviews.

If such procedures are adopted and carried out in connection with a number of future exercises, a unique material on crisis and catastrophe journalism might be gathered.

## H Possibilities of dispensability of reporters

Fundamentally, the exercise offered two possibilities of evading the journalistic filter, both being tested for the first time in connection with a nuclear crisis exercise.

In Finland a constantly updated and very comprehensive Finnish-language description of the course of the exercise (even more comprehensive than the Finnish news agency-version) was issued over the Internet. The Internet offers a fundamentally interesting possibility for the authorities to reach parts of the population with everything from service information to disavowals of media-communicated matter.

In Denmark a special Questions & Answers-Centre was established in the Bernstorff bunker, where the public might ask questions directly over the telephone. Both Ritzaus Bureau and the Radio Denmark news service informed the public of this possibility of accessing experts directly for questioning.

During the exercise this Questions & Answers-Centre was used by students from the Danish School of Journalism. Their task was through floods of questions to test the stamina of the experts regarding unstructured and often quite emotional questions.

The progress of the exercise proved that exactly in this respect the experts yet have a lot to learn, before they can handle calls from the public. Observations during the exercise as well as a verbal, spontaneous evaluation immediately after the exercise showed that the experts may have difficulties in answering journalists, but that this is nothing compared to the difficulties the experts confront when tackling unstructured and emotional questions from the public.

These experiences indicate that media-based communication - including its inherent possibilities of elucidation and interpretation - is an indispensable part of the management of a real-life crisis.

### 5.6.12 Concluding remarks

Every major accident or disaster is myth-creating. Myths are resistant to most forms of denials and updated communications from the authorities. This makes it important that the relationship between authorities and media is such that it does not produce myths. They may arise anyway. But they should not arise between central sources of catastrophe reporting and for instance journalists at national news agencies or public service radio- and television channels.

The most efficient factor in preventing and fighting myths is to let journalists be as direct participants as possible in national and international nuclear emergency exercises. The very level of the Finnish exercise has been appreciated by journalists, as noted above. A nuclear disaster is perceived by journalists as the ultimate professional challenge. Other sorts of disaster may be seen, heard, felt - registered through the usual senses. A nuclear disaster on the other hand may in its first stages only be described through the language, experts (under pressure) employ to communicate with journalists - and which the journalists (also under pressure from lack of time) have to translate into non-expert language. This simply cannot be done without training in realistic circumstances.

It is highly desirable to involve many journalists as participants in the exercises. Work schedules may imply that any news room's number one expert on catastrophe reporting is absent, when catastrophe happens. And the higher levels of change in editorial staff between special subjects as well as between editorial places of work mean that accumulated training in catastrophe reporting may disappear again very quickly. So, this is not a concern of the individual reporter but of the central editorial managements to take care that news rooms are staffed by a sufficient number of reporters trained in catastrophe reporting.

The general relationship between authorities and experts on the one hand and the media and reporters on the other - as well as concrete training in translation of expert language into common language - may benefit from having reporters involved in more exercises. Exercises create insight and training in translating the language of the experts into that of the public - because the very nature of the exercise occasions training these translations again and again until the result is both suitable and comprehensible.

Also experts and representatives of the authorities, especially spokespersons, may benefit from this process of translation. The exercise makes possible an experiment of departure from the correct, but rigid, language of the experts and civil servants in favour of a language better suited to the demands of reporters in a situation of communication often characterised by direct or near-direct broadcasts.

In the five Nordic countries, the three Baltic countries, Poland and the St. Petersburg region the situation now is that of having some of the world's most modern posts of radiation measurement that can communicate some of the world's most precise measurement results on-line to everyone competent to interpret them. In the event of disaster all this will be in vain, if we do not have reporters at our disposal who quickly and correctly can communicate these results and their interpretation to the public in ways both credible and comprehensible.

**Appendix to "Journalistic reporting back to national media in their home countries"**

A Report and Evaluation of Media Conditions and Coverage during the International Nuclear Exercise of 1997 - a Nordic Perspective

By Erik Lund and Jette Drachmann Søllinge

Press releases must be true, credible, intelligible, and updated. Else they are of little worth. If they are issued decentrally they should be co-ordinated in order to avoid mutually conflicting information.

The Finnish press releases of the exercise were issued decentrally. They were issued by no less than five different institutions in different locations. This endows each of them with an authenticity which is useful in a crisis. The releases are aimed at different target groups. So this is probably not an excess of information which would have been the case, if all five institutions had tried to reach the same journalists.

The releases from IVO are unsurprisingly closest to the actual process of the exercise. They are highly explicit in the introductory part which they are the only ones to treat, but change their character during the process into short statements of facts. Obviously there have been no resources for nor intentions of stating other than concise facts for further editorial processing. Especially radio and television favour ultrashort flash news.

The releases from STUK are more comprehensive and come at more regular intervals. They bear a visible mark of being issued by an organisation with resources to produce continuously updated information, but in form and contents they also bear the mark of being statements by authorities. A certain degree of implicitness and a markedly technical style probably make expert or other assistance to technically less informed journalists necessary.

Releases from the Ministry of the Interior and the police are of consistently informative character on the superior and the concrete levels respectively. Those from the Ministry primarily give notice of press conferences, i.e. refer to possibilities of further information.

Releases from the Ministry of Foreign Affairs are short and concise, obviously destined for journalists outside Finland or for correspondents to foreign media, (temporarily) resident in Finland.

These five sets of press releases are not conflicting, but are complementary to each other and may be used independently of each other.

It is remarkable how promptly the Ministries of the Interior and of Foreign Affairs follow up on information issued by IVO and STUK.

# 6. OVERALL APPRAISAL AND RECOMMENDATIONS

This chapter is for summing up the central issues of the appraisal and the recommendations for each subsection in Ch.5 and concluding whether the objectives were met.

## EXERCISE METHODOLOGY

A more comprehensive Nordic- Baltic directive, than only describing the objectives and the central participating organisations, is recommended for future exercises to outline the common basis, limitations of the exercise and advance preparations necessary in the participating countries. Details of the implementation of the objectives should be kept apart so that the directive itself can be distributed to the participants or inserted into the national directives.

Briefing should be done of all the participants, inclusive the media, on the limitations of the exercise, participating organisations, changes in normal communication channels and other relevant issues well in advance.

Seriousness of the accident scenario was challenging for the participants, inclusive media.

Selecting the real weather of the day was vital for exercising the meteorological services. However, from that follows an uneven distribution of work load for other organisations and functions to be exercised. It is recommended that in future exercises, depending on the objectives and the organisations/functions to be exercised, either real weather of the day or of some other suitable day is selected.

Regarding the inserts during the exercise see the text in N1 and N3.

## MEANS OF COMMUNICATION

Concerning the communication channels special assessment (and planning) should be carried out to find out:

- the speed of various channels to transmit the information from country to country down to the recipient needing/using that information,
- ways and means to improve the quality of the messages so that the text is intelligible, the message in the figures and maps clear,
- ways to limit unnecessary duplicates of messages blocking the channels, but ensuring that sent messages reach the goal,
- dedicated technical solutions for channelling most important messages concerning the accident and meteorological information.
- possibilities to extend the use of teleconferences in communication between the countries.

Attention should be paid to logging of the time correctly. Also the built in clocks should be in time. The UTC time should be used systematically in all international communication.

## OBJECTIVE N1

The questions N1 a and b put to the participating organisations were rather informal and the response to these questions will therefore not necessarily reveal the organisations ability to make estimates and prognoses of the situation in real time. N1c would most likely be taken care of internally in Norway.

However, in this exercise the objective to estimate and assess the situation and to make prognoses was well met partially based on good communication between the accident country and the other Nordic countries and partially on independent but similar technical (only Sweden) and meteorological assessments carried out in the Nordic countries.

It is recommended that in emergency organisations in all Nordic countries experts on reactor technology and meteorology are present to interpret, evaluate and explain such information.

## OBJECTIVE N2

Exchange of key information between the Nordic countries, based on bilateral agreements was good, as regards the timing and not changing the contents of the messages. One exception was noted:
-information on the release having started was unnecessarily delayed by waiting for information on its composition and magnitude. It would be better to send the information on the release having started immediately and additional information as a second transmittance, because it has an impact on actions in other countries.

Regarding the transmittance of information via IAEA and EU some problems in changing the contents were spotted:
- one was the change in the contents in a message coming from the EU to Denmark, changing the original "50 km east of Loviisa" to "within a radius of 50 km "
- another in reporting about the releases into the environment; the receivers were not always sure which nuclide, which quantity or which unit (may be due to phone communication, different reference times etc.).

The evaluators emphasise the necessity to be precise with units, radionuclides and reference times, even when the assessed quantities may not be precise.

E-mail has been used increasingly and it is likely that it still increases. Logging of communication should cover better all types of channels in the best suited way, because logging is not only important for evaluation but it may also have legal implications. Co-operation between the countries is recommended when improving the logging techniques.

It is recommended that information which is critical for further assessments in other countries, such as on fuel damage and release having started, should be transmitted without delay. Meteorological information belongs also to this category.

## OBJECTIVE N3

The evaluators believe that the kind of questions as in this objective do not call for contacts before answering them, and thus do not reflect the ability to co-operate. In the accident country there is no time to take contacts on non-central issues. Only Norway tried to take contacts before making decisions, but without success. Differing views were taken in the Nordic countries.

It is emphasised that creating a common basis for decisions and confidence on each others judgements in advance is particularly important for the early phase after an accident. For a later phase means should be sought for improved communication with neighbouring countries. Teleconferences would be one possibility for simultaneous contacts between several countries.

## OBJECTIVE N4

Direct contacts to Estonia from Finland, based on bilateral agreement, were unsatisfactory because of the old and busy lines in Estonia. Faxes during 8 hours were not received. However, overall the objective was met satisfactorily, because contacts, mainly faxes, between the Baltic and other Nordic countries functioned. Five to ten faxes were sent between each Nordic ( Finland either many more or less than five) and Baltic country.

Comparison of transmittance of information directly on the basis of bilateral agreements and via EU to the Nordic countries and via IAEA to Latvia and Lithuania showed that transmittance of information via IAEA was always much slower, which is regrettable as Latvia and Lithuania depended on that rout. Bilateral agreements should therefore be established between countries where they do not yet exist.

Recommendations in Objective N2 are also valid for the Baltic countries.

There is a great need to improve contacts between the emergency organisations of the Baltic countries, in particular, of Lithuania. Also contacts between other corresponding authorities in the Baltic countries need to be improved.

## OBJECTIVE N5

Since the Gulf war the span of time available for journalistic processing of information on an event has been dramatically reduced. The consequence of this is that the authorities and the media must develop and test models of co-operation. Exercises are vital here; they produce insights when - as in this case- they are carried out on a level attracting the real attention of the media. A consequence of the low level of the former exercise was that this time it was difficult to induce the media to reserve staff for the new exercise - in general terms, a low level of interest causes a too late, too haphazard and too unreliable reservation of staff for the task. So it is important that all exercises are kept at a level likely to attract and keep the interest of the media.

Promise of participation ought to be given by the media involved so early in time that journalists may be briefed on the same level and to the same extent as the other participants in the exercise. Media demand for immediate access to relevant information should be balanced by the duty of media to participate in ways ensuring the strengthening of competence not only with the reporters in the field but also with the editorial levels of staff. The alternative is one of rumours supplanting information.

The primary market for news is nationally delimited no longer. Any major event will immediately trigger fierce international competition for being first with the news. National news media will only be able to maintain their publics interest if they are allowed access to competent national news sources no later than the international media - access, that is, to national sources as informed of the event as the reporters of the media.

A general recommendation in this field is one of sophistication and systematising of journalistic participation in the exercises confirming to the guidelines above (cf. section 5.6 of the report for details). In order to increase the realism of future exercises - at the same time creating a better foundation for analysis of media-related elements of the exercises - it is further recommended that some centre is assigned the task of real-time reception and subsequent analysis of the resulting media products.

## ANNEX 1

## N1 Estimation and assessment of the situation in real time threat phase, release phase and by prognoses for the following day

### Pre release phase

**N1 a**
This fax is presented at 11.30 Finnish time (08.30 UTC) to the players from one of the high rank representatives from the competent authority (e.g. SSI, NRPA) who is at a meeting in Murmansk:

*Dear BOB (use real name at compet. authority)*

*As you know, I'm in Murmansk participating in a meeting of the "Barents Sea Committee" together with representatives from all Nordic countries, Russia, USA and Canada. Our minister of Environment, who is also attending, has asked me for a personal update on the situation and I therefore urgently need some information from you.*

*Rumours here in Murmansk say that the situation at Loviisa is similar to the TMI accident in 1979 and that a reactor core damage of the same magnitude is expected. Please send immediately your comments on this, an update on the situation in Finland, i.e.a description of the event, core- and containment status and prognosis, and countermeasures taken or planned to protect the public.*

*Please send the information to me as soon as possible at fax no: ..... (use real number (national exercise direction?)) - it is not possible to get through on the phone.*

### Release phase

**N1 b**
Same procedure as for the threat phase. This following fax shall be sent at 15.00 Finnish time (12.00 UTC):

*Hello again BOB*

*Rumours here in Murmansk now claim that the situation at Loviisa has developed to the worse and that there is a release. Our Minister wants another personal update. Do you have any information about the magnitude and composition of the release? Please send promptly your comments on this and the latest information you have on the situation in Finland, i.e.a description of the event, core and containment status and prognosis, and countermeasures taken or planned to protect the public. How do you assess the consequences for our country and the situation in Finland?*

*Please send the information to me at fax no:..... (use real number).*

**Prognoses for the next hours**

**N1 c**

To prepare for this question, the Norwegian news agency will send out a news telegram through the media channels at 17.00 Finnish time (14.00 UTC) containing the following information:

*The results published by the University of Oslo are:*

1. *The estimated maximum dose rate outdoors in the..... area at 21.00 Thursday and 09.00 Friday Finnish time (18.00 UTC and 06.00 UTC): 2 500 000 nGy/h and 18 000 000 nGy/h.*

2. *The estimated maximum air concentration of $^{131}I$ in the ..... area at 21.00 Thursday and 09.00 Friday Finnish time (18.00 UTC and 06.00 UTC) 500 000 000 Bq/m$^3$ and 370 000 000 Bq/m$^3$*

3. *The estimated maximum ground contamination of $^{137}Cs$ in the ..... area at 21.00 Thursday and 09.00 Friday Finnish time (18.00 UTC and 06.00 UTC) 190 000 000 Bq/m$^2$ and 300 000 000 Bq/m$^2$*

The following request is sent from the Prime Minister's office at 18.00 Finnish time (15.00 UTC), with the news telegram from Norway enclosed:

*The Prime Minister will give an interview in (national broadcast agency news bulletin). He will surely be asked to comment on the calculations published by the University of Oslo (enclosed) on the consequences of the nuclear accident in Finland and the lack of official national calculations of this kind. What we can understand, the results are alarming. We don't know exactly who made these calculations, but we need official assessments as soon as possible to meet these allegations and avoid that the authorities are accused for holding back information.*

*The calculations have been made for (a place to be decided later), where the Ministries of Foreign Affairs of EU and Nordic countries at the moment are discussing the nuclear co-operation with Russia and the Baltic countries and made a point out of this. The results are quite alarming and you are kindly asked to do assist during the interview and present your own assessments and estimate the corresponding results so that we can convince the press and the media that official calculations of the same quantities as published by the University of Oslo (see enclosure) are available and that no information is held back. Could you therefore please estimate the following at 21.00 UTC today and at 09.00 UTC tomorrow morning?:*

1. *Estimated maximum dose rate outdoors in the ..... area?*
2. *Estimated maximum air concentration of $^{131}I$ in the ..... area?*
3. *Estimated maximum ground deposition of $^{137}Cs$ in the ..... area?*

*Please send the name of your representative and the answers as soon as possible to the Office of the Prime Minister to the following fax no: ..... (use real number). If you have two pieces of useful graphics where the numbers are shown, please bring them to the interview which takes place in the Office of the Prime Minister at 17.00 UTC (20.00 Finnish time). We will contact you and confirm the time later.*

## ANNEX 2

## N3 Co-ordination of recommendations

### N3 a

At 11.30 Finnish time (08.30 UTC) the following fax should be sent:

*Our company, NOKIA, is arranging an important head of staff (or representatives) meeting Friday and Saturday at a leisure centre in Borgå, approx. 40 km west of Loviisa. Representatives from all Northern Europe with their families are supposed to attend. Our representatives here in ..... (name of country) are now worried about the situation. Should we cancel the trip for ourselves or our families? Please advise us on what to do.*

### N3 b

Air flight companies/Airport managers in each countries are contacting the authorities about the risk of flying to Helsinki, St Petersburg or over the affected area at 14.45 Finnish time (11.45 UTC).

*Due to the accident in the Finnish nuclear power plant we need to know if we should re-schedule any of flights crossing the affected area or go on as normal We get a lot of questions from anxious passengers and our crew members about how safe/dangerous it is to fly across south-east of Finland. What should we tell them? Please answer promptly.*

### N3 c

At 17.30 Finnish time (14.30 UTC) a national dance company submits their question by fax:

*We are a senior year class from the national dance academy (an appropriate company should be used for each country, Åbo or Rovaniemi dance company when question to Finnish authorities) going to Helsinki this evening for a guest play at the opera in Helsinki. Is it safe to travel there or should we postpone the trip? The organisers say "the show must go on" but we are hesitating. Please reply as soon as possible.*

## ANNEX 3

### ESTONIA

According to the existing laws and regulations in Estonia the responsibilities are divided between the authorities participating in the emergency response as follows:

- National Rescue Department is responsible for the operative leadership, and receives the data from the monitoring stations of the Estonian early warning system,
- Radiation Protection Centre is the expert authority in radiation protection and collects the data from the early warning system in Estonia, which consists of gamma monitoring stations maintained by the Hydro-Meteorological Service, and from other organisations carrying out monitoring activities,
- Environmental Emergency Service (National Contact point, 24 hours duty) subordinated to the Ministry of Environment, receives the international emergency information from IAEA and from the neighbouring countries and communicates it immediately to the operative attendant of the Rescue Department.

In addition to the two first mentioned organisations having directly responsibilities in nuclear emergency preparedness, the following organisations also have responsibilities in an emergency situation based on their normal duties:

- Hydro-Meteorological Service provides meteorological data and co-operates with the above authorities to assess the radiological situation in Estonia for the operational use and for public information,
- The Ministry of Social Affairs is responsible for the health protection, inclusive the control of food contamination, advise on decontamination, advise on behaviour in hazardous situation, keeps records of over exposed people,
- The Ministry of Agriculture is responsible for restrictions in agriculture and for organising control of food and fodder,
- The Ministry of the Environment monitors radiation situation and predicts its development, sets up its own operative centre for emergency management,
- The National Maritime Board monitors possible radioactive releases with the help of fishing boats and other ships sailing in the Eastern part of the Gulf of Finland .

### LATVIA

Based on the law of Civil Defence of the Republic of Latvia and the law on Radiation and Nuclear Safety the State Radiation and Nuclear Accidents Emergency Preparedness plan has been prepared. According to the State Radiation and Nuclear Accidents Emergency Preparedness plan, in the enhanced readiness of the emergency response, the state institutions in Latvia have the following responsibilities:

- Civil Defence Centre of Latvia notifies relevant state authorities, mass media and population and summons Emergency Management group at Management Centre of Civil Defence Centre. Emergency Management group includes Steering group, Radiation Expert team, Information unit. Depending on the situation the Emergency Management group is manned with people from relevant authorities such as the Civil Defence Centre of Latvia, the Radiation and Nuclear Safety Inspectorate, National Environmental Health Centre etc.. Radiation Expert team has the responsibility to assess the radiation situation and co-ordinate actions regarding countermeasures, Information unit prepares information for authorities, mass media and population.

- State Hydrometeorological Agency provides the Emergency Management group with meteorological information and radiation plume predictions, results from manual surface gamma monitoring stations and radioactivity soundings of the Agency,
- Radiation and Nuclear safety Inspectorate acts as the contact point to IAEA early warning system and is the expert authority in radiation and nuclear safety matters collecting and processing such information for the Emergency Management group,
- Border Guards run radiation control posts on borders and organise monitoring of transports and people
- National Environmental Health Centre is responsible for health protection and carries out radiation monitoring and dose assessments,
- Environmental Data Centre compiles information from Early Warning System with 8 automatic on-line gamma monitoring stations and mobile units,
- Aviation Rescue and Search Co-ordinating Centre informs Air Traffic Safety Service regarding radiation situation.

## ANNEX 4

## EVALUATION SEMINAR 29 - 30. 9. 1997

A seminar on the evaluation was held in Helsinki with 60 participants from all the Nordic and the Baltic countries as well as from Russia. The seminar, chaired by E.Naadland Holo the project leader of EKO-4 and by Å.Persson the NKS chairman of the exercise planning group, started with presentations of the technical scenario (K.Sjöblom) and dose calculations for the exercise scenario in real time (S.Vuori). The evaluation report was presented by A.Salo and its information part by Jette Drachman Søllinge. The members of the evaluation group had the opportunity to emphasise issues that they considered to be important in their respective countries.

T.Sillanpää pointed out that at a certain moment the neighbouring country might receive from accident country for instance measuring data observed at different time via different channels (telephone, telefax, via IAEA and EU). So, in accident country units, nuclides and measurement time should be carefully checked and also in receiving countries the time delay between different information channels should be noticed.

J.Jensen stressed the need to pay attention to the delays in information transmittance inside a country and to the problems of overloading information channels with the same messages coming via various routes.

H.Tovedal pointed out the problems in basing the evaluation solely on logbooks, which were far from complete, in particular regarding important information transmitted per phone. He also stressed the advantages in using real weather from another day in exercises. That would make the experts time more efficiently used during an exercise.

E.Tanner, U.Poris and G.Morkunas emphasised the continuing need for Baltic - Nordic co-operation. Also the assistance questions were touched.

In the discussion part of the seminar short prepared presentations were made on important issues to be considered in future co-operation:

- F.Ugletveit discussed the importance of common criteria, harmonised decisions and improved flow of information.
- H. Aaltonen discussed the needs and difficulties in timely notification and information exchange.
- J.Holst Hansen discussed the problems in handling multiple messages on the same subject, possible solution could be separating alerts and operational information from common information. The former need to be communicated fast and safely and the latter could be available on bulletin boards using the new technology.
- E.Olafsdottir pointed out experiences during the exercise regarding insufficient distinction between new and old information, too much information per fax and too little per e-mail and difficulties in connecting to the exercise WWW server.
- T.Walderhaug presented technical solutions to the problems of overloading the communication channels. He proposed a categorisation of messages and the suitability of different communication means for each category. He also described the methods to increase the availability of the servers by increasing server bandwidth, restrict access to server or distribute information on several servers. A dedicated network for authority

information is preferred to WWW as the latter is uncertain in the event of a nuclear accident because of people seeking for information.

- V.Hein stressed the importance of information to avoid rumours and panic and to enhance credibility. It is also vital for ensuring that advise and instructions are followed. She also stressed the importance of co-operating with the media who have the information channels at their disposal. The audience pointed out the conflict between the media wanting to sell and the authorities wanting to protect but she meant that media wants to co-operate during the first two days and starts criticising first after that.
- K.Melakoski did not like the use of the word media because it covers a too broad range from yellow to serious. She recommended establishing of "news groups" in an accident situation. People need in addition to information also the feeling of the society. According to her the sequence of importance regarding the information channels is: radio, WWW, TV, news papers.
- R.Hänninen meant that future exercises should focus on specific tasks, such as review and development of planning and evaluation instructions and use of new information methods (e-mail, WWW, graphical presentation, background material). In the discussions the use of teleconferencing between the countries came up.
- R.Mustonen called for more close integration of the Baltic States into the Nordic co-operation and for more consistent operational intervention levels. Co-operation could cover also practical procedures for mass monitoring of iodine in thyroid and for airborne surveying of contaminated areas.

Information on more general nature was provided during the seminar by the following persons:

- T.Lazlo on the NEA´s programme in international nuclear emergency exercises
- T.Bennerstedt on NKS and on the planning status of its coming programme
- E.Naadland Holo on NKS participation in NEA´s forthcoming INEX-2-CAN exercise
- B.Petrov informed about the Russian experiences of the INEX-2-FIN exercise.

All the presented material have been compiled and will be handed over to the NKS secretariat for future use in emergency preparedness projects.

## ANNEX 5

## CHAIRMANS NOTE

After the evaluation seminar September 29-30, 1997 the participants had the opportunity to send their comments on the evaluation report within one week. The International Atomic Energy Agency (IAEA) was not represented at the seminar and therefore the report was handed over to the IAEA representative before publishing it.

Checking of the IAEA records on transmission to and on receipt in the Baltic countries of messages revealed that there were not more than a few minutes differences between the Baltic countries.

Delays in IAEA between the in-coming and out-going messages are due to the IAEA´s policy to verify and authenticate the notification, and regarding some messages to analyse in relation to action that would be required. Also possible errors in messages need to be checked.

However, these delays can not explain all time differences observed in making the evaluation on the bases of the logbooks in the countries.

In those cases where good logbooks existed at each location in the preparedness organisation handling the messages, one substantiated thirty minutes delay within the organisation itself could be spotted in the draft report, but this did not change the main conclusions.

Where logbooks were missing or inadequate there is no substantiated basis to change the observations several month after the exercise.

Various explanations for time differences are possible, such as
- mixing of UTC and local times,
- mixing the time of prognosis for an event with that of it being established (e.g. time of established fuel damage was expected not the prognosis),
- contact point being in different organisation or different department than the persons handling the matter and keeping the logbooks,
- incomplete or unclear logbooks.

There is no point in trying to adjust the times in the evaluation report after having had time to study the logbooks in the countries during four months before closing the case. The important issue is to try to find the ways to improve the information exchange in all organisations that find any undue delays in their information exchange with others.