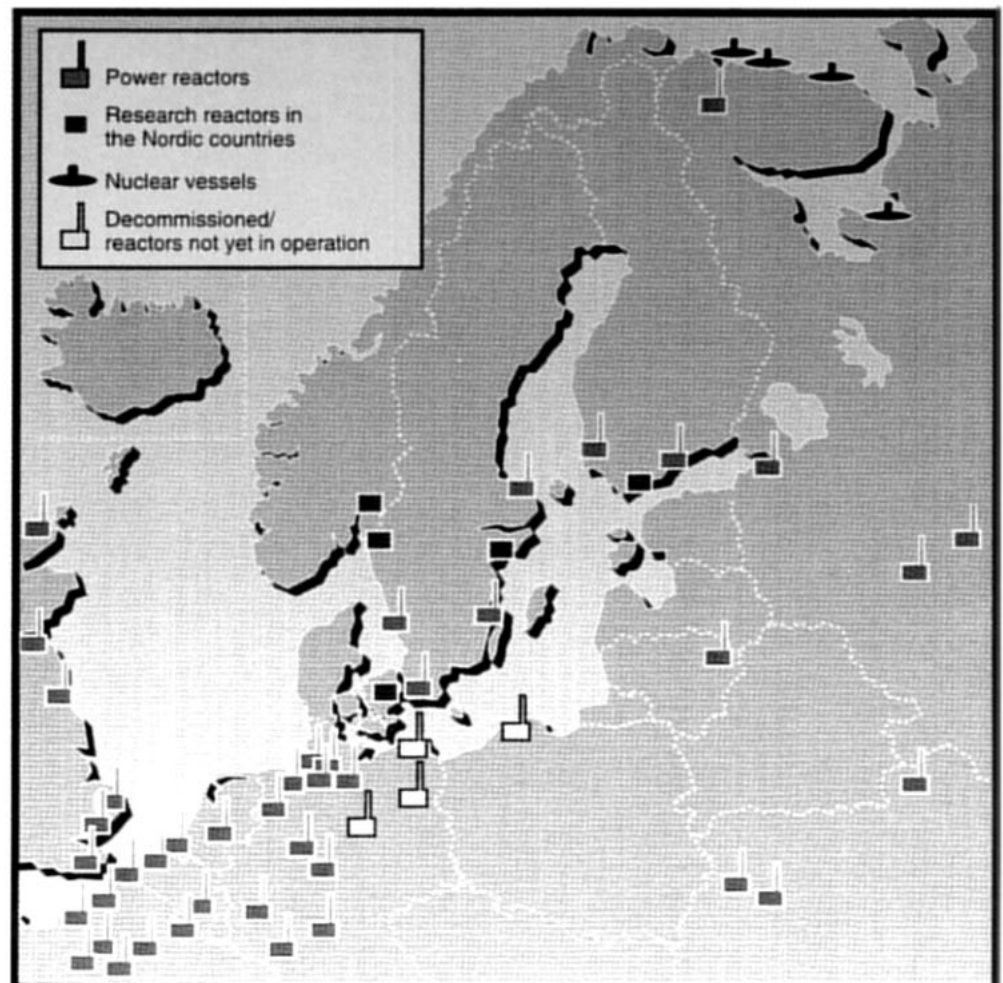


# Evaluation Report of the Nordic Emergency Exercise Odin - November 26, 1993



TemaNord  
1994:556



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## **The Nordic Council of Ministers**

was established in 1971. It submits proposals on co-operation between the governments of the five Nordic countries to the Nordic Council, implements the Council's recommendations and reports on results, while directing the work carried out in the targeted areas. The Prime Ministers of the five Nordic countries assume overall responsibility for the co-operation measures, which are co-ordinated by the ministers for co-operation and the Nordic Co-operation Committee. The composition of the Council of Ministers varies, depending on the nature of the issue to be treated.

## **The Nordic Council**

was formed in 1952 to promote co-operation between the parliaments and governments of Denmark, Iceland, Norway and Sweden. Finland joined in 1955. At the sessions held by the Council, representatives from the Faroe Islands and Greenland form part of the Danish delegation, while Åland is represented on the Finnish delegation. The Council consists of 87 elected members - all of whom are members of parliament. The Nordic Council takes initiatives, acts in a consultative capacity and monitors co-operation measures. The Council operates via its institutions: the Plenary Assembly, the Presidium, and standing committees.



**EVALUATION REPORT OF THE NORDIC  
EMERGENCY EXERCISE ODIN  
NOVEMBER 26, 1993**

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# **EVALUATION REPORT OF THE NORDIC EMERGENCY EXERCISE ODIN**

## **INTRODUCTION**

Under the umbrella of the Nordic Nuclear Safety Research Programme (NKS) a two phase emergency exercise has been carried out. The first phase NORA took place January 14, 1993. The exercise dealt with the acute phase after a nuclear accident outside, but close to the Nordic Countries. The accident became known first as a rumour which later proved to be true.

The second phase ODIN dealing with the late phase, was initially planned to be carried out at different days in the five Nordic countries as a pure »table top« exercise. However, the exercise NORA showed that it cannot be taken for granted that the decisions made in each of the Nordic countries would be in line with each other, or that contacts would be taken to ensure co-ordination, at least not in the acute phase after an accident. On the contrary, strong national thinking labeled the decisions. However, it was suggested that in the late phase the situation would be different.

The plans for the late phase exercise were therefore changed to include the element of mutual contacts. Thus the exercise was carried out on the same day in all five Nordic countries in order to enable the contacts among the countries.

The main argument in favour of a co-ordinated approach in the intervention policy in the Nordic countries is that the public would not understand nor accept very different ambition levels in the protection of the public in these countries, not even in the case where protective actions could differ from country to country.

Also, in general the international development in Western Europe implies, besides the national thinking, an expectation of strong international co-ordination.

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# 1. THE OBJECTIVES OF THE EXERCISE

The main objective of the exercise ODIN was to

- increase the Nordic countries knowledge and capability to handle a joint deposition situation after a nuclear accident
- improve provisions for Nordic co-ordination of the overall decision making and for obtaining a joint Nordic view in emergency response.

Several more detailed sub-objectives were identified, which are as follows:

To test the capability of participating organizations to

- analyse and assess the situation
- introduce relevant protective actions in order to protect the population, property and the environment
- exchange information on decisions and plans
- co-ordinate the available resources (expert knowledge, measuring resources, databases, libraries etc.)
- exchange ideas and inform each other on activities regarding information to the public
- avoid »double messages«
- take advantage of existing communication means
- co-operate with international organizations such as IAEA, WHO and EU

After the evaluation of the exercise ODIN: give basis for suggestions for desirable national improvements in the emergency organization.

## 2. THE PARTICIPATING ORGANIZATIONS

The central authorities, responsible for advice and decision on measures in emergency situations involving radionuclide contamination, participated in the exercise. The participating countries themselves decided to which extent they exercised and to which extent they simulated functions in addition to those of the central policy making authorities. Field functions were not exercised.

The responsibilities of the authorities in the Nordic countries are described in detail in the national emergency plans. In the late phase after an accident, the responsibilities are in most cases derived directly from the normal legal duties of the authorities with some necessary co-ordination by the responsible emergency organization; for Norway see below the responsibilities of the Crisis Committee in the early phases of a nuclear accident.

The decision making, expert advice and co-ordination was provided in the exercise as described below.

In Denmark the emergency response arrangements are co-ordinated by the Emergency Management Agency of the Ministry of the Interior with the help of a central command center. In the ODIN exercise this included persons from the National Institute of Radiation Hygiene, Risø National Laboratory, the Chief of Defence-Denmark, The National Food Agency, the Plant Directorate, the State Police, and the Danish Radio. The command center directs and co-ordinates the response to civil nuclear accidents. It can co-ordinate and decide upon the warnings and the implementation of protective actions, it assesses the situation and informs the public.

In Denmark 32 persons participated in the exercise.



In Finland the Ministry of the Interior has the responsibility for the over-all co-ordination of the emergency response. The authorities and experts invited by the ministry to participate in the work of the co-ordination group depend on the type of the accident, but in the late phase of a nuclear accident, such as in this exercise, they are: the Finnish Centre for Radiation and Nuclear Safety, the Cabinets Information Unit, the Ministry of Foreign Affairs, the Ministry of Social Affairs and Health, the Ministry of Agriculture and Forestry, the Ministry of the Environment, the Ministry of Transport and Communications, the National Food Administration, the Finnish Meteorological Office, the National Board of Waters and the Environment, and the Finnish Broadcasting Company. They meet as necessary for co-ordination in the Ministry of Interior, but decisions are made in the respective organizations.

In addition to the participants there were liason officers in the exercise from the Defence Staff, three counties, and from Åland.

In Finland about 150 persons participated in the exercise.

In Iceland the Civil Defence Authority is responsible for emergency response in situations that threaten public welfare or can lead to serious loss of property. Emergency response functions in case of nuclear accidents are co-ordinated by the civil defence, the food control, and the radiation protection authorities. There is a central body of experts from these authorities as well as key organizations such as marine research and meteorology. This body can include experts from other organizations such as fisheries, agriculture etc. as needed. The relevant departments and authorities are responsible for protective actions in the late phase unless there is a general emergency in which case the Civil Defence authority is in charge.

Experts from the Civil Defence Authority, the National Institute of Radiation Protection, the Oceanographic Institute, the National Center for Food Control, and the National Weather Bureau took part in the exercise ODIN.

In Iceland 16 persons participated in the exercise.

In Norway a new organization of emergency response was established earlier in 1993. The nuclear emergency organization consists of Ministries, the Ministerial Coordination Committee, the Advisory Committee for Nuclear Accidents, the Crises Committee for Nuclear Accidents, the Secretariat for the Advisory Committee and for the Crises Committee. The Crises Committee is responsible for managing the acute phase after a nuclear accident. The institutions represented in the Advisory Committee are the Norwegian Meteorological Institute, the Directorate for Nature Management, the Directorate of Civil Defence and Emergency Planning, the Norwegian Defence Research Establishment, the Shod Norway Military Head Quarter, the Institute of Marine Research, the Institute for Energy Technology, the Department of Police in the Ministry of Justice, the Coast Directorate, the Geological Survey of Norway, the Agricultural University of Norway, the Norwegian College of Veterinary Medicine, the Norwegian Institute for Air Research, the State Pollution Control Authority, the Directorate of Health, the National Institute of Public Health, the Norwegian Food Control Authority, the Norwegian Radiation Protection Authority. In order to have an effective management of the early phase of a nuclear accident six institutions in the Advisory Committee for Nuclear Accidents form the Crisis Committee for Nuclear Accidents. These institutions are the Norwegian Radiation Protection Authority, the Directorate of Civil Defence and Emergency Planning, the Shod Norway Military Head Quarter, the Department of Police in the Ministry of Justice, the Directorate of Health, and the Norwegian Food Control Authority.

In the early phases of a nuclear accident the Crises Committee has been given the responsibility and authority to decide and give order to carry out remedial actions in order to prevent or reduce the radiological and economic consequences in the Norwegian society. If possible the committee shall

discuss their decisions with the Ministers before actions are carried out. The rest of the Advisory Committee acts as an expert group giving advice to the Crises Committee.

In Norway 22 persons participated in the exercise.

In Sweden the county administration boards are responsible for the emergency response. They get advice in radiation accidents from a central emergency preparedness organization maintained by the radiation protection authority, the Swedish Institute of Radiation Protection. The following expert organizations are represented in the organizations: the Swedish Institute of Radiation Protection, the Statens Räddningsverk (Swedish Rescue Services Board), the National Food Administration, the Swedish Board of Agriculture, the Swedish Nuclear Power Inspectorate, and the Swedish Meteorological and Hydrological Institute. In this exercise, only the four first mentioned participated.

In Sweden 27 persons participated in the exercise.

### 3. HOW THE EVALUATION WAS ORGANIZED

The evaluation of the exercise was performed at two levels, the national and the Nordic. The aim of the evaluation is to obtain a basis for further development of the national emergency preparedness and for future development of the Nordic co-operation in planning for emergency preparedness and in management of accident situations. In order to provide a similar basis for evaluation in each country, the Nordic evaluation guidelines were prepared similar to those for exercise NORA.

The evaluation organization consisted of

- the Nordic chief evaluator
- one Nordic evaluator for each of the five countries, who was also the national chief evaluator for the country
- national evaluators for different functions or sites. The number of national evaluators varied from country to country depending on the extent of the exercise and the organization.

The distribution of the national evaluators was the following:

<b>Denmark:</b>	<b>* The Command Center</b>	<b>1</b>
	- the co-ordination group	1
	- group of experts	1
	- situation evaluation group	1
	- radiation monitoring group	1
	- information service group	1
	- secretariat	1
	in total 7 evaluators	

<b>Finland:</b>	* Ministry of the Interior	4
	* Finnish Centre for Radiation and Nuclear Safety	2
	* Cabinets Information Unit	1
	* Ministry of Social Affairs and Health	2
	* Ministry of Agriculture and Forestry	1
	* Ministry of the Environment	1
	* National Food Administration	1
	* Finnish Broadcasting Company	1

in total 13 evaluators

<b>Iceland:</b>	* National Institute for Radiation Protection	
	– group of experts	2

in total 2 evaluators

<b>Norway:</b>	* Emergency Operation Centre	
	– organization and planning of the exercise	1
	– assesment and decision making	1
	– information	1
	– logistics	1
	– communication	1

in total 5 evaluators

<b>Sweden:</b>	* Emergency Response Center	
	– leading group and secretariat	1
	– group of authorities	
	– assessment group	1
	– communication & services group	1
	– information group	1

in total 4 evaluators

In the appraisal of the performance of the various functions and of the exercise methodology the following rating was used: good, satisfactory or unsatisfactory.

**Good** implies that the response or function was performed without significant failings in all countries.

**Satisfactory** implies that the response or function was performed with minor failings and delays creating some confusion.

**Unsatisfactory** implies that the response or function was performed with major failures which could have contributed at least to economic losses.

In the overall evaluation, the appraisal indicates whether the aims were met perfectly, satisfactorily or not at all.

## 4. EXERCISE METHODOLOGY

The main emphasis in the exercise was put on decision making, in particular in policy matters and in communication among the countries.

A Nordic scenario was worked out jointly by the Nordic exercise management group. Based on the Nordic scenario a detailed event description was developed for each country in their own language with Nordic as well as national inserts. Like in the NORA exercise, Nordic and in line with them national exercise guidelines were worked out.

The participants were expected to use their own languages during the exercise but for Nordic contacts it was permitted to use English if there was a risk of misunderstanding in particular in contacts with Finland and Iceland.

The exercise was conducted under the leadership of the Nordic exercise co-ordinator, who was assisted by a Nordic exercise management group consisting of representatives from each Nordic country. The group members were located in their own countries during the exercise. Each country had their own national exercise manager and exercise management group: Denmark 7, Finland 14, Iceland 3, Norway 6, and Sweden 5 persons.

In Denmark, Iceland, Norway, and Sweden the participants were at one location but in Finland in several locations i.e. in their regular offices, but co-ordination meetings were held in the Ministry of the Interior.

The scenario described in prehistory No.1 was an accident in a pressurised water reactor in an unspecified neighbouring country called »NABO«. The time of the accident (June 17) was just before the midsummer feast, which is an active holiday and festivity period in some of the Nordic countries. The accident was categorized to No 6 in the INES classification. The releases consisted of noble gases and fission products, being similar to those of the Chernobyl accident, however, with lower iodine content. The second day the releases stopped. The weather had long been nice summer weather but during the accident day it changed to unstable (Pasquill A) and rainy weather. Therefore the releases were predicted to spread over the entire area of the Nordic countries and would cause a very patchy deposition pattern. The weather changed back to nice the day before the exercise started. A couple of weeks in advance, the prehistory No.1 together with maps showing the isodose curves as well as the contamination levels and the nuclide composition of the deposition in each country were given to the heads of the responsible organizations participating in the exercise. These persons were asked to fill in prepared check lists of possible actions which they would have taken during days one to five after the described accident and to send the lists back to the exercise management before the exercise. The exercise was carried out on the sixth day after the accident happened.

The real exercise day November 26 was known to the participants well in advance; the simulated day was June 22.

The exercise started with a simulation of a shift change in the participating organizations with a briefing of a new team about the events during the night between days five and six. A prehistory No.2 was distributed giving more details of the deposition and concentrations in milk in the »hot« areas in each country and a summary of actions taken in all Nordic countries. During the exercise the participants received additional data on »hot« areas, the activity levels being about the same in all countries. They also received other national and Nordic inserts, which were either planned in advance or improvised during the exercise and which were expected to prompt Nordic contacts. The only question put to the participants was what do you do now?

## **5. THE EVALUATION**

Below are given the observations, recommendations and appraisals for the functions considered the most important from the Nordic perspective as well as for the exercise methodology:

### **5.1 Responses by the emergency organizations to the check lists on actions taken during days one to five**

#### **OBSERVATIONS:**

The answers to the check lists on actions taken during the days one to five after the accident ,were highly professional although some of the answers did not specify the exact time when the actions were taken during the five days period. The answers were mostly in good agreement with each other, but they were only used to a limited extent in neighbouring countries during the exercise. The summary of the actions taken is presented in table 1.

#### **RECOMMENDATION:**

The idea that the check lists on actions taken during the acute phase should be sent in advance for completion can be recommended to be used in future late phase exercises as well. However, more time is necessary for briefing the participants on the events and actions taken prior to the exercise. For further recommendations see Ch.5.7.

#### **APPRAISAL:**

The professionalism of handling the acute phase of the accident was of high standard and the agreement between the answers from different countries was satisfactory.

### **5.2 Evaluation of the situation during the exercise**

#### **OBSERVATIONS:**

The majority of actions that had been taken during the first five days were also maintained in all countries during the exercise. However, some of the actions taken were changed during the exercise. These changes are also shown in table 1.

Concern was expressed in several countries of the differences between the Nordic countries regarding the intervention levels for food. The proposal for a Nordic model to harmonize intervention levels for food (Food Safety after Nuclear Accidents - a Nordic model for national response; NORD 1992:33) is not adopted officially by the countries, but it was used in some countries in the exercise. The proposal was prepared by an expert group consisting of representatives from the food and radiation protection authorities in the Nordic countries. Because of the limited areas of high contamination in each country in the exercise, the different intervention levels would have caused only limited differences in the health and economic consequences in a similar real situation. Realizing the problem, it was decided that the responsible authorities in the Nordic countries should meet the following day and discuss co-ordination of strategy for food restrictions.

#### **RECOMMENDATION:**

However good and co-ordinated the assessment of the situation is, the results will from the public point of view seem different without having harmonized the intervention strategy. In particular the importance of harmonization of the intervention levels for food must be stressed. It is very important that the responsible authorities in the Nordic countries arrive at common principles and strategy. The special requirements of international trade (Codex Alimentarius) and of one country (DK) being a member of the EU with its own standards, have to be accommodated in the strategy. In the aftermath of an accident, a meeting of the Nordic authorities may be desirable in order to discuss a joint long term strategy for actions, which cannot be decided in advance without knowing the exact situation.

#### **APPRAISAL:**

The capability to assess the situation in a similar way is good in the Nordic countries because of long co-operation in the field. However, the derived conclusions are not necessarily the same without a joint basis agreed in advance and consultations on application before actions. In this respect the situation is not yet satisfactory.

### **5.3 Decision making process**

#### **OBSERVATIONS:**

Nationally, decisions were made in co-ordination with relevant authorities as during the acute emergency phase. In all other countries except Finland, the authorities were gathered in the same emergency center. However it is questionable whether this would normally occur in the late phase of an accident. In Finland the relevant authorities were in their regular offices and despite the short exercise period, the internal co-operation was in most cases successful, but the overall co-ordination could be stronger.

There was an ambition, and attempts were made, to discuss the basis of the decisions among the Nordic countries before taking the decisions. Each country took several Nordic contacts, in particular with the neighbouring countries, before implementing decisions but it turned out that the purpose was mainly to inform each other about the decisions, not to consult or co-ordinate, apart from food restrictions.

#### **RECOMMENDATION:**

The importance of early communication between the Nordic authorities in order to avoid »double messages« to the public must again be stressed. The interest from the media during the late phase after an accident has some bearing upon the necessary frequency of Nordic communications, and this should also be discussed with the representatives of the media.

#### **APPRAISAL:**

Good as regards the decision processes in the countries. Nordic communication regarding consulting and co-ordination of decisions was only partly satisfactory.

## **5.4 Communication to other Nordic countries and non-Nordic countries as well as to international organizations**

### **OBSERVATIONS:**

Again some problems with wrong fax numbers appeared, which were rapidly straightened out. Technically everything functioned better than in the NORA exercise. The catalogue with all fax and phone numbers to be used during exercise ODIN was an excellent tool, as the authorities were not all in their regular offices. Some deficiencies in the knowledge of the Nordic countries organizations in different types and phases of accidents surfaced. A decentralized organization as in Finland, could be more realistic in the late phase. When working decentralized without sufficiently strong co-ordination, it is more likely to get slightly different information from different authorities, as happened. During the short exercise a reasonable number of contacts were taken from each country to at least its closest neighbouring countries. As mentioned earlier, the contacts were mainly to inform each other and not to co-ordinate or consult. The countries were aware of each others actions taken. Table 2 presents a summary of the registered (or estimated ) contacts taken. It shows that there may be deficiencies in registering the contacts and/or some faxes not having reached the recipient.

The countries also simulated contacts with non-Nordic neighbouring countries and international organizations such as IAEA, EU, WHO and OECD/NEA as expected.

### **RECOMMENDATION:**

The knowledge of other Nordic countries organizations, including the possible changes with accident phase, should still be improved. The organizations working in their regular offices in the aftermath of an accident should be exercised in order to have both internal and Nordic contact and co-ordination problems simultaneously.

Information on actions taken and data should be on computer available to other Nordic countries to be drawn as desired. Since the sister organizations normally have contacts with each other from their regular offices, the fax and phone numbers should be well known to each other, nevertheless it must be stressed that the constant updating of these numbers is vital. Modern electronic methods should be used as far as practicable.

### **APPRAISAL:**

The communication between the Nordic countries was good as regards the amount of contacts but only satisfactory regarding the substance. The simulated contacts were good.

## **5.5 Information to the public**

### **OBSERVATIONS:**

The information to the public was efficient. There were contacts among the Nordic countries on the contents of the information but the contacts were not sufficient to avoid »double messages«.

**RECOMMENDATION:**

The communication between those responsible for information in the Nordic countries' organizations should be further developed also in a late phase situation.

**APPRAISAL:**

The information transmittance to the public varied from country to country, but was in general satisfactory.

## **5.6 Technical facilities**

**OBSERVATIONS:**

The technical facilities in the emergency centers were mainly good. There were still some problems with faxes and lacking maps from other countries. However, the situation may not be fully satisfactory if the various authorities are working in their regular offices. Electronic communication was not used between the countries.

**RECOMMENDATION:**

The technical aids for communication, such as electronic mail, should be deployed as much as practicable, however, keeping in mind their vulnerability.

**APPRAISAL:**

In general the technical facilities are satisfactory but they need some upgrading to facilitate the communication between authorities and countries, and to monitor the reactions in society.

## **5.7 Planning and carrying out the exercise**

**OBSERVATIONS:**

A late phase accident exercise is quite different from an acute phase emergency exercise. The first problem is how to brief the participants on the events and decisions taken in the acute phase after the accident. In a real situation the staff would be well acquainted with the situation and with the actions taken prior to the sixth day after the accident. The short briefing in some countries at the beginning of the exercise simulating the take over of a new shift, did not create a sufficiently realistic situation. More detailed description of the situation would have helped. The completion in advance of the check lists on actions taken during the five first days after the accident was a good idea and gave time, at least to the heads of the organizations to consider the situation in depth. E.g. in Finland, the organizations discussed the actions taken before the start of the exercise in a co-ordination meeting and thus briefed the participants. Also in Iceland the participants were briefed one day before the exercise.

The scenario and the event sequence descriptions developed for the exercise were suitable for the purpose of testing the Nordic collaboration, even if the scenario was not considered very realistic by all. It should be kept in mind that it is not easy to develop a scenario with equal levels of contamination at limited areas in each of the Nordic countries at the same time, which would allow to see the possible differences in the protection strategies. The experiences obtained during and after the Chernobyl



accident in handling a late phase of an accident gave a very good basis for both national decision making and Nordic contacts.

The exercise directive with the communications information was good. Also the management of the exercise and the umpires functioned well. The selection of participating organizations done by each country without Nordic guidance were basically good but in some countries lack of some expertise was observed during the exercise and was complemented on an ad hoc basis.

#### **RECOMMENDATION:**

If it is decided, in the future to have another Nordic exercise on a late phase of an accident it is important to consider how to make the scenario more realistic and how to brief the participants to the same level of knowledge as they would have in a real situation. The completion of action lists in advance can also be recommended in the future, but more time is needed prior to the exercise e.g. the day before to get acquainted with the contents of the completed check lists. More time is also needed for the exercise itself, from 10 to 24 hours. It should be considered, too, to improve the realism by introducing organizational changes according to the accident phase.

#### **APPRAISAL:**

Being the first late phase accident exercise, the planning of and carrying out ODIN was good in general.

### **5.8 The overall evaluation of the exercise**

The exercise ODIN made a valuable contribution to increase the Nordic countries capability of handling a joint deposition situation and to obtain a joint Nordic view in emergency response. Thus the main objective of the exercise was met satisfactorily.

Regarding the sub-objectives of the exercise,

- the assessment of the situation was made satisfactorily
- the selection of protective actions was highly professional and mostly in line with those in the other the Nordic countries,
- information exchange on decisions was good but consultation and co-ordination prior to the decisions was only partly satisfactory,
- co-ordination of the available resources was not necessary as the situation did not go beyond the national resources,
- exchange of ideas regarding information to the public was not sufficient,
- the avoidance of »double messages« could not fully be met,
- technically the communication was good
- simulation with international organizations was good.

The exercise hopefully prompts in-depth discussions between the relevant Nordic authorities leading to an agreement on the late phase intervention strategy, including intervention levels, in particular for food. If so happens, the exercise would have met its main objective perfectly.

The planning of and carrying out the exercise was good in general.

**TABLE 1. Protective actions at the contaminated areas during days one to five taken from the check lists and, in the footnotes, the changes during the exercise.**

Protective action	Denmark	Finland	Iceland	Norway	Sweden
Sheltering&shut windows/doors	no	avoid unnecess. staying outdoors	no	children <7a indoors in areas >1000nSv/h (6	no
Evacuation	no	no	no	no	no
Iodine prophylaxis	no	no	no	no	no
Children & pregnant women	no	no (2	no	see above	no
Domestic animals indoors	no	yes	yes	yes	yes
Restrictions on consumption:					
rain/surface water	no	yes	yes, surface w.	yes, rain w.	yes, rain w.
tap water	-no	-	-	-	-
green vegetables	yes,wash (1	yes, plans for temporary trade restrictions (3	- harvest, cover	yes, stop to sell from areas g.vegetables (7	yes, prohibition to >150 nSv/h
milk	no	no (4	yes, >1000 Bq/l	yes, of cows grazing outdoors	yes, of cows from areas >150 nSv/h
other	control of imported food	plans for temporary trade restrictions, stop to harvest new potatoes	imported from contaminated countries	-	-
Tourism	no	no	no	no	no
Customs&borders	yes	yes/control	-	- (8	-
Trade&sea traffic	yes	yes/control	yes	- (9	no
Other measures	advise not to travel to NABO	prohibition to travel >100 km from NABO, protect wells, green vegetables and fodder (5	- fac.	- (10	use masks when changing filters in airconditioning

**Changes during the exercise:**

- |   |  |
|---|--|
| (1 stop sales of lettuce                                    | ( 6 canceled   |
| (2 added some restrictions to play in sand pits, pools etc. | ( 7 >1000 Bq/kg shall be destroyed   |
| (3 stop sales of unprotected green vegetables               | ( 8 no actions taken   |
| (4 intervention >100 Bq/l                                   | ( 9 Codex values introduced  |
| (5 change ventilation filters;avoid dust from ground        | (10 removal of sand from playing grounds; postpone changing of filters in airconditioning fac. |

**TABLE 2. Registered contacts between the countries during the exercise.**

	DENMARK fax only		FINLAND fax(+phone)		ICELAND contacts		NORWAY fax+phone		SWEDEN fax+phone	
	in	out	in	out	in	out	in	out	in	out
DENMARK	-	-	3	4 (5)	1	6	3	7	6	8
FINLAND	7 <sup>2</sup>	4	-	-	8	6	4	8	15	13
ICELAND	4	2	5	4 (5)	-	-	6	7	7	7
NORWAY	7	3	1	4 (5)	7	7	-	-	9	6
SWEDEN	6 <sup>2</sup>	3	5	4 (20)	9	6	6	8	-	-

(1 estimated number

(2 including some concerning exercise methodology

# **ANNEX I. LIST OF THE NAMES OF THE AUTHORITIES AND INSTITUTES IN THE NORDIC COUNTRIES**

## **DENMARK**

Emergency Management Agency  
Danish Meteorological Institute  
Flag Officer Denmark  
Laboratory  
National Institute of Radiation Hygiene  
National Food Agency  
State Police  
Chief of Defence - Denmark  
Danish Radio  
Ritzaus Bureau  
Ministry of Foreign Affairs  
Plant Directorate, Ministry of Agriculture

Beredskapstyrelsen  
Danmarks Meteorologiske Institut  
Søværnets Operative Kommando Risø National  
Forskningscenter Risø  
Statens Institut for Stålehygiejne  
Levnedsmiddelstyrelsen  
Rigspolitiet  
Forsvarskommandoen  
Danmarks Radio  
Ritzaus Bureau  
Udenrigsministeriet  
Plantedirektoratet, Landbrugsministeriet

## **FINLAND**

Ministry of the Interior  
Finnish Centre for Radiation and Nuclear Safety  
Cabinets Information Unit

Ministry of Foreign Affairs  
Ministry of Social Affairs and Health

Ministry of Agriculture and Forestry

Ministry of the Environment  
Ministry of Transport and Communications  
National Board of Waters and the Environment

Defence Staff  
Finnish Meteorological Office  
National Food Administration  
Finnish Broadcasting Company

Sisäasiainministeriö/Inrikesministeriet  
Säteilyturvakeskus/Strålsäkerhetscentralen  
Valtioneuvoston tiedotusyksikkö/Stadsrådets in-  
formationsenhet  
Ulkoasiainministeriö/Utrikesministeriet  
Sosiaali- ja terveysministeriö/Social- och hälso-  
vårdsministeriet  
Maa- ja metsätalousministeriö/ Jord- och skogs-  
bruksministeriet  
Ympäristöministeriö/ Miljöministeriet  
Liikenneministeriö/ Trafikministeriet  
Vesi- ja ympäristöhallitus/ Vatten- och miljösty-  
relsen  
Pääesikunta/ Huvudstaben  
Ilmatieteenlaitos/Meteorologiska Institutet  
Elintarvikevirasto/Livsmedelsverket  
Suomen Yleisradio/Finska Rundradion

## **ICELAND**

Civil Defence Authority  
The National Institute for Radiation Protection  
The Oceanographic Institute  
The National Center for Food Control  
The National Weather Bureau

Almannavarnir ríkisins  
Geislavarnir ríkisins  
Hafrannsóknarstofnun  
Hollustuvernd ríkisins  
Vedurstofa íslands

## **NORWAY**

The Advisory Committee for Nuclear Accidents:  
Norwegian Radiation Protection Authority\*  
Directorate of Civil Defence and  
Emergency Planning\*  
Norwegian Food Control Authority\*  
Shod. Norway Military Head Quarter\*  
Directorate of Health\*  
Ministry of justice: Department of Police\*  
State Pollution Control Authority  
Directorate for Nature Management  
Institute for Energy Technology  
Norwegian Institute for Air Research  
Norwegian Meteorological Institute  
The National Institute of Public Health  
Geological Survey of Norway  
Norwegian Defense Research Establishment  
Institute of Marine Research  
Agricultural University of Norway  
The Norwegian College of Veterinary Medicine

\* are members of the Crises Committee  
for Nuclear Accidents

Faglig råd for atomulykker:  
Statens Strålevern

Direktoratet for sivilt beredskap  
Statens Næringsmiddeltilsyn  
Forsvarets overkommando  
Helsedirektoratet  
Justisdepartementets politiavdeling  
Statens Forurensningstilsyn  
Direktoratet for naturforvaltning  
Institutt for Energiteknikk  
Norsk Institutt for Luftforskning  
Det Norske Meteorologiske Institutt  
Statens Institutt for folkehelse  
Norges geologiske undersøkelse  
Forsvarets Forskningsinstitutt  
Havforskningsinstituttet  
Norges landbrukshøgskole  
Norges veterinærhøgskole

Kriseutvalget for atomulykker

## **SWEDEN**

Swedish Institute of Radiation Protection  
Statens Räddningsverk  
National Food Administration  
Swedish Board of Agriculture  
Swedish Nuclear Power Inspectorate  
Swedish Meteorological and Hydrological Institute

Statens Strålskyddsinstitut  
Statens Räddningsverk  
Livsmedelsverket  
Jordbruksverket  
Statens Kärnkraftinspektion  
Sveriges Meteorologiska och Hydrologiska  
Institut

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# Evaluation Report of the Nordic Emergency Exercise Odin

- November 26, 1993

ODIN was the second part of a major Nordic emergency programme. The first exercise (NORA) has been performed early in January, 1993, to test responses to a simultaneous threat to all Nordic countries. The second exercise, ODIN, started 6 days after a heavy fallout had occurred in each of the Nordic countries. This report contains the evaluation performed by an independent Nordic team of evaluators.

The Nordic Committee for Nuclear Safety Research - NKS organizes pluriannual joint research programmes. The aim is to achieve a better understanding in the Nordic countries of the factors influencing the safety of nuclear installations. The programme also permits involvement in new developments in nuclear safety, radiation protection, and emergency provisions. The three first programmes, from 1977 to 1989, were partly financed by the Nordic Council of Ministers.

## The 1990 - 93 Programme

Comprises four areas:

- \* Emergency preparedness (The BER-Programme)
- \* Waste and decommissioning (The KAN-Programme)
- \* Radioecology (The RAD-Programme)
- \* Reactor safety (The SIK-Programme)

The programme is managed - and financed - by a consortium comprising the Danish Emergency Management Agency, the Finnish Ministry of Trade and Industry, Iceland's National Institute of Radiation Protection, the Norwegian Radiation Protection Authority, and the Swedish Nuclear Power Inspectorate. Additional financing is offered by the IVO and TVO power companies, Finland, as well as by the following Swedish organizations: KSU, OKG, SKN, SRV, Vattenfall, Sydkraft, SKB.

ADDITIONAL INFORMATION is available from  
the NKS secretary general, POB 49, DK-4000 Roskilde, fax (+45) 46322206



**The Nordic Council of Ministers**

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