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NKS FOOD Final report

Inger M. H. Eikermann

Norwegian Radiation Protection Authority

November 2011

Abstract

The purpose of the workshop was to share national practice and experience on the use of different tools (handbooks, late phase models etc.) during a crisis with focus on operational implementation and use, interpretation and verification of results and production of decision basis.

The main goal was to establish a common ground to better understand how these are used in the different countries, identify differences and exchange knowledge to increase competence.

Second goal was to gather stakeholders and authorities with interest or responsibility for countermeasures against radioactive contamination of food products to share experience in different topics as:

- Cooperation among stakeholders and organisations responsible for food safety in each country
- Adaptation of the Euranos handbook "Countermeasures for the management of food production systems" to national conditions and implementation of the handbook in each country
- Establishing a Nordic network for food authorities and radiation protection authorities responsible for food safety with respect to radioactivity

There were 23 participants representing all the Nordic countries. Some of the speakers present were Klas Rosèn (SLU), Kasper Andersson (RISØ), representatives from the Nordic food authorities and Ministries, representatives from the radiation protection authorities and one speaker from the food industry.

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NKS FOOD Final report

Final Report from the NKS-B FOOD (Contract: AFT/B(09)8)

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Abstract

NKS-B FOOD workshop - Nordic workshop for authorities, organisations and institutions responsible for late phase countermeasures and safe food production in nuclear emergencies at Losby Gods, Norway 14-15th April 2010.

The purpose of the workshop was to share national practice and experience on the use of different tools (handbooks, late phase models etc.) during a crisis with focus on operational implementation and use, interpretation and verification of results and production of decision basis.

The main goal was to establish a common ground to better understand how these are used in the different countries, identify differences and exchange knowledge to increase competence.

Second goal was to gather stakeholders and authorities with interest or responsibility for countermeasures against radioactive contamination of food products to share experience in different topics as:

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In particular, neither NKS nor any other organization or body supporting NKS activities can be held responsible for the material presented in this report.

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1. Introduction

Each of the Nordic country has delegated the responsibility for safe food with respect to radioactive contamination to several authorities. Tight and continuous cooperation between decision support system developers, radiation protection authorities and food authorities are necessary to ensure that best possible tools are taken into use and that the authorities know what to do and to expect from each other in an emergency situation. Among the Nordic countries different action limits have been adapted for reindeer meat. A Nordic cooperation will also contribute to understand the logic behind these differences and can help harmonising the countermeasure strategies in food production.

The goal of the project was to gather stakeholders with interest or responsibility for countermeasures against radioactive contamination of food products.

2. Abstracts

Session 1: General radiation protection, radioecology and scenarios for long-term consequences

Soaking foodstuff with lye as a countremeasurement to reduce radioactivity (Holm, Elis)

The concentrations of Cs-137, K-40 and Po-210 have been studied in pike, reindeer and dried ling before and after soaking in lye (NaOH).

The extraction velocities were the same for Cs and K both in lye and rinse process showing that Caesium is present in intracellular and ionic form. The proteins have a slower brake down showing that Polonium is associated with proteins.

Reduction of alkali nuclides Caesium and Potassium were between 80-100% while Polonium showed an average reduction of 20%

Consequences for Norwegian food stuff after a severe nuclear accident (Ytre-Eide, Martin)

Prevalent meteorological conditions coupled with Norway's geographical position make the country exposed in the event of an uncontrolled release due to an accident at nuclear facilities such as Sellafield and Leningrad NPP. Large atmospheric releases are expected to have serious consequences in Norway, especially for the rough grazing animal production.

To assess the consequences of a nuclear deposition, the NRPA are developing a model called Stratos. This model is a GIS based and is made to meet the Norwegian conditions. The model is still in an early face, but it already provides useful results and has a lot of potential. It uses Tag values together with the Norwegian intervention levels and tackles many uncertainties by using the Tag value dispersion.

Session 2: Responsible authorities for food countermeasures and food monitoring in the Nordic countries - presentations from all countries

Cooperation between Finnish Food Safety Authority and Finnish Radiation and Nuclear Safety Authority in serious radiation situations (Karlström, Ulla)

Both Finnish Food Safety Authority (Evira) and Finnish Radiation and Nuclear Safety Authority (STUK) have responsibilities concerning food safety issues. In serious radiation situations, it is important to know the division of duties and tasks between the two authorities. Therefore in Finland these duties have been discussed and a protocol has been signed by the general directors in good understanding of organizations' roles in emergency situations.

In principle, STUK is the expert organization with best knowledge about the current and evolving situation making recommendations for other authorities. Evira is the competent authority concerning food and feed measures and giving instructions for local authorities performing the practical measures dealing with food and feed safety. Close cooperation is needed in emergency situations.

Cooperation is strengthened by scientific projects and regular meetings between participants from both organizations.

Iceland's response plans (Halldórsson, Óskar)

Preparedness in Iceland against the risk of radioactive fallout contaminating foods draws parallels from the emergency preparedness against volcanic ash. The division of labour and responsibilities is clear. In short, the Icelandic Civil Defense Coordinates, the Icelandic Radiation Safety Authority measures extent of radioactivity and constructs plans in coordination with Civil Defense, the Food and Veterinary Authority is responsible for animal health decisions. Response plans similar to the ones that would be used in the case of radioactive fallout are in action following the eruption of Eyjafjallajökull volcano. Due to its volcanic nature, Icelandic soil (largely Andosol) has different transfer coefficients for uptake of Cs-137 than mid European standards anticipate. In this year, a lot of work is being put into preparedness enhancement in Iceland. This is motivated by new laws and restructuring developments at the Civil Defense.

A brief overview of the responsibilities of the Swedish National Food Administration (NFA), organisation, network, training in case of a nuclear emergency (Svensson, Kettil)

NFA is responsible for implementing legislation and enforcement concerning radioactive substances in food. This implies that NFA gives restrictions on food and are responsible for checking compliance with maximum permitted levels in food,

establish control programmes (e.g. for reindeer) as after Chernobyl and perform market basket surveys. It also gives recommendations to the general public. In case of an emergency it advises the Counties.

In Sweden it is up to food industry to comply with rules such as max permitted levels of radioactive substances in food.

Approximately 1 full position at NFA annually is devoted to preparedness activities concerning nuclear emergencies. Most important partners within co-operation are the Swedish Board of Agriculture (SJV; responsible for implementation of new EU-legislation within the agriculture area; SLV is responsible for foods), Swedish Radiation Safety Authority (SSM)

Swedish University of Agriculture Sciences (SLU), Swedish Defense Research Agency (FOI)

Co-ordinated by the Swedish Civil Contingencies Agency (MSB).

NFA participates in several projects co-ordinated by MSB (management plan 2010 - 2015) in order to increase preparedness against nuclear emergencies such as dealing with: alarm phase, education, Q&A, communication and a special project (together with SJV) on inventory of laboratory resources and analytical competence in Sweden in case of a new nuclear emergency. It is also involved in a national sampling strategy plan from grass to milk in case of a nuclear emergency.

NFA regularly practise within exercises carried out by the Counties with nuclear power plants (every second year). Participates every second year in workshops (training) organised for regional and local authorities by SJV.

Session 3: Tools for handling food countermeasures

Nordic improvements of the ECOSYS model for ingestion dose estimation (Andersson, Kasper G.)

A work group under the NKS-B activity PARDNOR has revised the input data in the ECOSYS model that is incorporated for ingestion dose modeling in the ARGOS and RODOS decision support systems. These systems are integrated in Nordic nuclear emergency preparedness. The investigations take into account recent and location-specific measurement data, and demonstrate the need for targeting the model for use in Nordic preparedness. The findings of the PARDNOR activity show that considerable dose estimation errors that could lead to wrong decision support may occur if ECOSYS is used with current default parameters. The work should attract European interest (all RODOS and ARGOS users) and derivation of European location specific parameters and final generation and implementation of generic as well as location specific model data libraries should be a European task (EURATOM).

Handbook for managing contaminated food production systems (Kostiainen, Eila)

EURANOS handbook for food production systems, Generic handbook for assisting in the management of contaminated food production systems in Europe, has been developed as a result of a series of European and, in particular, UK initiatives, which started in the early 1990s. It has been produced with financial support from European Commission as a part of project EURANOS and with significant input from stakeholders.

The main objective of the Handbook is to illustrate how to select and combine management options to build up a recovery strategy. There are datasheets which provide up-to-date information on management options and factors affecting implementation. There is also guidance on planning in advance of an incident. Because of the generic nature of the handbook it can only be used to full advantage following customisation at national or local level.

The production systems considered in the handbook include agricultural and domestic food production and free foods from the wild. The sources of contamination considered in the food handbook are from a nuclear site or weapons transport accident, but the handbook will be relevant also to other radiation incidents. The radionuclides considered are the ones for which management options will be most likely needed, e.g. those with high likelihood of release, long physical half-life, high radiological toxicity or high mobility in the environment. The handbook is targeted to national and local authorities, radiation protection experts, representatives of agriculture and food industry sector as well as other stakeholders affected by contamination of the foodchain. Examples of most likely applications of the handbook are: in the preparation phase, under non-crisis conditions to involve stakeholders to develop local/national plans; in the post-accident phases by local and national stakeholders as part of the decision aiding process; for training purposes, for example in preparation and during emergency exercises.

Session 4: Stakeholder involvement in food management

Radiological events: Countermeasurements and action plans (Birgersson, Carol)

In the possible event of a radiological emergency it is important to have common basic views on suitable actions and preparedness in the case of the spreading of radioactive substances. Radioactive substances cannot be destroyed; they can only be moved or avoided. The consumer is afraid of the danger and the market will show no tolerance. For that reason the industry will not use any contaminated food products or crops.

In the case of an emergency, good preparedness is needed on; alarm systems, ability to use time of forewarning and ability to measure the situation of the fallout. Another crucial factor is to give proper information to the public. Good preparedness also concerns action plans on what to do. The authorities have their alarm systems, do measurements and inform on the situation, but the industry need to have their own actions plans and analysis capacity on food measurements.

The food producer and the market will need advice from experts to be able to decide on actions. For single farmers and industries the situation also induces a lot of questions that affect their economy. What to do with contaminated crops? How should it be treated? Where to deposit the waste? On the farm? Etc. The situation will require a good collaboration between all actors to maintain the confidence to the public.

The private actors are sensible to alarms in the press. The way in after an accident are crucial and very important. There are big risks for anxiety and rumours. A placard and then you run.

EURANOS pilot study on stakeholder involvement in late phase countermeasures in food production (Eikermann, Inger M. H.)

The framework on long-term rehabilitation of living conditions in contaminated areas was developed as part of CAT3 activities. After the testing with a group of French stakeholders, a similar Pilot Study was performed in Norway.

Two seminars were arranged for the Norwegian stakeholders. The first seminar was held in Steinkjer, a region that received substantial fallout from the Chernobyl accident, on 6-8 February 2008. The second seminar was arranged near NRPA headquarters in Oslo on 4-5 March the same year. There was a diversity of participants at the seminar, ranging from local stakeholders like veterinarian, nurse, doctor, farmer, reindeer herder and municipality administration to regional authorities (food safety authority, reindeer herding administration, county administration) and national authorities (ministries of environment, health and agriculture; food safety authority; public health institute; directorate of health; nature management directorate; national veterinary institute; NRPA). In addition, there were representatives from non-governmental organisations like Forum for nature and outdoor life, Norwegian reindeer herders' associations and Kjeller homeowners' association, and representatives from industry (radioactivity lab personnel, Institute for Energy Technology, Norwegian Seafood Export Council). The participants were a mix of people with and without experience in Chernobyl consequences and management.

The seminars were lead by two independent facilitators – Prof. Deborah Oughton (Norwegian University of Life Sciences) and Ingrid Bay-Larsen (Nordland Research Institute). The seminars lead to a list of recommendations from the participants to the authorities in Norway:

1. At the local level, nuclear emergency preparedness should be strengthened with the aid of:
 - a. Local measurement stations
 - b. Communal emergency plans
 - c. Involvement of the primary health services

2. At the State level, nuclear emergency preparedness should be strengthened with the aid of:
 - a. Sector-wide implementation of countermeasures on a regional and local level
 - b. Improved follow-up of the municipalities
3. There is a particular need for both the Food Safety Authority and the health sectors to clarify their roles in emergency preparedness.
4. The present knowledge and competence needs to be maintained and developed in the form of:
 - a. Documentation and transfer of experience from post-Chernobyl management
 - b. Improving the knowledge on radioactivity in the general public
 - c. Dissemination on the conclusions of research and studies
5. Information strategies are an important means of alleviating psycho-social stress in the public. Information must be consistent, based on local measurements (in affected areas) and be available in more languages than Norwegian and Sami.
6. Any eventual reduction in the food intervention level for radioactive caesium in reindeer meat needs to be evaluated with respect to social, health, cultural and economic factors. At the present time, the benefits of such a reduction appear to be small compared to the disadvantages.
7. The roles and division of responsibilities between industry and authorities should be clarified with respect to risks to market, image perception and measurement capacity.

The French IDPA method was adapted during this study, and found to be useful for discussions. The main benefits of the technique are clearly the multidisciplinary aspects and that actors with a wide range of experience and expertise are brought together. While it has not been possible to test against other procedures, hence there may be alternative methods that can also foster co-operation at this level, it is clear that there is a real need for dialogue and stakeholder communication in emergency planning, particularly to extend the engagement of local and lay actors. It is important that sufficient time is given to discussions, since these issues cannot be resolved during a half-day seminar, and facilitation can help ensure that the outcomes of discussions are seen to be independent. The “Identification” stage of the process aided in giving a sense of “ownership” of the study to the group, and helped people to get to know each other. However, it did occasionally seem that some issues were so obvious that they could have been discussed in depth already at the first meeting, so there was some feeling of repetition by the second meeting. And it should be said that good social events are just as important in facilitating understanding and shared responsibilities! It was also clear that some of the themes were more relevant to all participants compared to others. Nevertheless, the overwhelming response from participants was positive, particularly from local actors who felt that their opinions and knowledge had not previously been taken into account by national authorities. However, at the end of the day, the success of this meeting for many participants will be measured by the extent to which the recommendations they made will be acted on and taken seriously by the emergency preparedness authorities.

With respect to the aims of CAT3 it should be noted that even though the seminars followed an overall agenda, the discussions often shifted focus and context. Hence it was not always clear whether one was discussing what happened immediately after Chernobyl or whether the focus was on the present situation. Even though the aim of the seminar was to give response on long-term management, the discussions also focused on the immediate emergency phase.

The original aims and success criteria of the Pilot Study were as follows:

- To have a group balance between national, regional and local actors.
- To have a group able to review lessons from the past and to make recommendations.
- The participants are ready to be an asset in case of future contamination.
- An increase of awareness on this issue.
- A better understanding of the responsibilities of each participant (national, regional and local).

Measured against these criteria, it is clear that the Pilot Study has fulfilled its original intentions. The hope is that this is only the start of the groups' input to emergency preparedness and long-term rehabilitation in Norway, and that the NRPA will continue to use and develop such extended participation methods in its activities within the Norwegian Nuclear and Radiological Emergency Organisation.

Session 5: Nordic network for food authorities - harmonisation of food countermeasures

Importance of good coordination between national authorities in nuclear emergencies (Brynildsen, Lisbeth)

After the Chernobyl accident in 1986 intervention levels were adjusted.

Methods for measurement of radio caesium in live animals such as sheep, goats, cattle and reindeer were developed. Efficient countermeasures to reduce the content of radio caesium in the contaminated animals had to be developed. This was solved by a close cooperation between authorities, science and animal owners.

In the work to implement countermeasures, divide Norway into zones and the measuring of the contaminated animals - there had to be cooperation between authorities at central level, at county level and at municipality level. In the steering committee and working groups representatives from the meat and dairy industry as well from the farmers and reindeer owner's organization met.

There has been international cooperation after the Chernobyl accident as well; with authorities and science from Sweden, UK, Russia, Bella Russia and Ukraine.

In emergency panning - for the time being - there are lot of challenges. The instruments for measurement in the laboratories in Norway (the earlier LORAKON system) are to a great extent old and few. It has to be taken a decision concerning type

of instrument, number of instruments, who shall measure (private laboratories?) and whom shall pay for the measurements. It would be desirable with Scandinavian cooperation while taking these decisions.

International cooperation is important while trying to avoid new incidents and accidents in the future.

The "Hygiene Package" and regulation of radionuclide intervention levels (Kvamsdal, Halvard)

The Hygiene Package of 29 April 2004 mainly consists of four regulations giving the general legal framework for hygienic production of foodstuffs and official controls:

- Regulation (EC) No. 852/2004 on the hygiene of foodstuffs
- Regulation (EC) No. 853/2004 laying down specific hygiene rules for food of animal origin
- Regulation (EC) No. 854/2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption
- Regulation (EC) No. 882/2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules

The general provisions for hygienic production of foodstuffs and official controls cover contaminants in general and apply equally to possible contamination with radionuclids. The Hygiene Package has two specific references to radioactivity/radionuclids:

Regulation (EC) No. 852/2004: Annex I. Primary production, Part B. Recommendations for guides to good hygiene practice:

Point 2. Guides to good hygiene practice should include appropriate information on hazards that may arise in primary production. Examples:

- a) The control of contamination such as mycotoxins, heavy metals and radioactive material;

Regulation (EC) No. 854/2004: Annex I. Fresh meat, Section II. Action following controls, Chapter V. Decisions concerning meat

1. Meat is to be declared unfit for human consumption if it:
 - (o) exceeds the maximum permitted radioactivity levels laid down under Community legislation

General provisions concerning radionuclide intervention levels

- Council Regulation (Euratom) No. 3954/87 of 22 December 1987 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feeding stuffs following a nuclear accident or any other case of radio-logical emergency

Specific Chernobyl provisions concerning radionuclide intervention levels

- Council Regulation (EC) No. 733/2008 of 15 July 2008 on the conditions governing imports of agricultural products originating in third countries following the accident at the Chernobyl nuclear power station (Codified version)
- Commission Regulation (EC) No. 1635/2006 of 6 November 2006 laying down detailed rules for the application of Council Regulation (EEC) No. 737/90 on the conditions governing imports of agricultural products originating in third countries following the accident at the Chernobyl nuclear power-station

3. Conclusion:

Tight and continuous cooperation between decision support system developers, radiation protection authorities and food authorities are necessary to succeed in an emergency situation. Systems for involving of stakeholders and food producers in decision making are essential. A Nordic cooperation will also contribute to harmonisation of the countermeasure strategies in food production in emergency situations and in that case may establish a Nordic Network that can work together with food safety in a radiological perspective. The workshop agreed that a Nordic network of representatives from the food- and radiation protection authorities will make an application to NKS for a project on implementation of the Euranos Handbook "Countermeasures for the management of food production systems" in the next program period.

Appendix

List of participants, NKS FOOD Workshop

Name	Institution	E-mail
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Programme

Wednesday 14.04.2010 at 12:00 - 17:00	
Lunch 12:00 - 13:00	
Introduction: Justin Gwynn, NKS and Inger Margrethe H. Eikermann, NRPA	
Session 1: General radiation protection, radioecology and scenarios for long-term consequences <i>Chair: Kasper Andersson</i>	
Stig Husin, Swedish Radiation Safety Authority	Ionisation Radiation and effects on the organism
Klas Rosén, Swedish University of Agricultural Sciences	Transfer of radioactive substances and countermeasures in the field of agriculture
Elis Holm, NRPA	Soaking foodstuff with lye as a counter measurement to reduce radiocaesium, potassium and polonium
Martin Ytre-Eide, NRPA	Accident at Sellafield - consequences for Norwegian food production
15:00 Coffee break	

Session 2: Responsible authorities for food countermeasures and food monitoring in the Nordic countries - presentations from all countries	
<i>Chair: Inger Margrethe H. Eikermann</i>	
Ulla Karlström, Finnish Food Safety Authority	Cooperation between Finnish Food Safety Authority and Finnish Radiation and Nuclear Safety Authority in serious radiation situations
Óskar Halldórsson, Icelandic Radiation Safety Authority	Iceland's response plan for countermeasures in the food production in serious radiation situations
Cécile Blom, Norwegian Food Safety Authority	Long term countermeasures and emergency preparedness in Norway
Ketil Svensson, Swedish Food Authority	A brief overview of the responsibility of the Swedish National Food Administration, its organisation, network, management of contamination from nuclear accidents
Aperitif / Dinner 19:00	

Thursday 15.04.2010 at 09:00 - 16:00	
Session 3: Tools for handling food countermeasures	
<i>Chair: Stig Husin</i>	
Stein Hoe, DEMA Kasper Andersson, RISØ	ARGOS / RODOS Food countermeasure tools and ECOSYS and PardNor activity
Torbjörn Nylèn, FOI	Monitoring strategy in an emergency situation
Eila Kostianen, STUK	EURANOS handbook "Countermeasures for the management of food production"
Inger Margrethe H. Eikermann, NRPA	Implementation of the Handbook in Norway
All	Implementation of the Handbook in the Nordic countries
Lunch 12:30 - 13:30	
Session 4: Stakeholder involvement in food management	
<i>Chair: Eila Kostianen</i>	
Carol Birgersson	The food industry as a stakeholder in managing food countermeasures after a nuclear accident
Inger Margrethe H. Eikermann, NRPA	EURANOS pilot study on stakeholder involvement in late phase countermeasures in food production
All	Experience of "stakeholder involvement"

14:30 Coffee break

Session 5: Nordic network for food authorities - harmonisation of food countermeasures

Chair: Inger Margrethe H. Eikermann

Lisbeth Brynildsen,
Norwegian Ministry of
Health and Care Services

Importance of good coordination between national authorities
in nuclear emergencies

Halvard Kvamsdal,
Norwegian Ministry of
Health and Care Services

The "Hygiene package" and regulation of radionuclide
intervention levels

All

Discussions and conclusions

16:00 Departure

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Abstract	<p>The purpose of the workshop was to share national practice and experience on the use of different tools (handbooks, late phase models etc.) during a crisis with focus on operational implementation and use, interpretation and verification of results and production of decision basis.</p> <p>The main goal was to establish a common ground to better understand how these are used in the different countries, identify differences and exchange knowledge to increase competence.</p> <p>Second goal was to gather stakeholders and authorities with interest or responsibility for countermeasures against radioactive contamination of food products to share experience in different topics as:</p> <ul style="list-style-type: none">• Cooperation among stakeholders and organisations responsible for food safety in each country• Adaptation of the Euranos handbook "Countermeasures for the management of food production systems" to national conditions and implementation of the handbook in each country• Establishing a Nordic network for food authorities and radiation protection authorities responsible for food safety with respect to radioactivity <p>There were 23 participants representing all the Nordic countries. Some of the speakers present were Klas Rosèn (SLU), Kasper Andersson (RISØ), representatives from the Nordic food authorities and Ministries, representatives from the radiation protection authorities and one speaker from the food industry.</p>
Key words	-