

Topical Session on Recovery Management Summary Report

Conducted at the OECD Conference Centre
15 May 2013

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Organisation de Coopération et de Développement Économiques
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Nuclear Energy Agency

Committee on Radiation Protection and Public Health

**Committee on Radiation Protection and Public Health, Working Party on Nuclear Emergency Matters
(CRPPH/WPNEM)**

Topical Session on Recovery Management Summary Report

**15 May 2013
OECD Headquarters**

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Radiological Protection

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NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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INTRODUCTION

Background

The 71st Meeting of the Committee on Radiation Protection and Public Health (CRPPH) took place 14 -16 May 2013, at the Organization for Economic Cooperation and Development (OECD) Conference Center, Paris, France.

The Nuclear Energy Agency (NEA) of the OECD and the CRPPH, as part of a broader initiative to identify and address issues resulting from the Fukushima nuclear accident, conducted two Topical Sessions at the 71st meeting of the CRPPH. Agenda item 1 of the meeting was a Joint CRPPH and Working Party on Nuclear Emergency Matters (WPNEM) Topical Session on Emergency Management. Agenda item 2 of the meeting was the presentation of a Joint CRPPH and WPNEM Topical Session on Recovery Management. This report documents the later, the Joint CRPPH and WPNEM Topical Session on Recovery Management.

The Fukushima accident took place in March 2011. By the end of 2011, with the reactors in cold shutdown, the situation changed from what the International Commission on Radiological Protection (ICRP) characterizes as an “emergency” to an “existing situation” (ICRP, 2007). In practical terms, this means that the Fukushima nuclear power plants were brought under control and no longer posed a significant risk for further radiological releases to the environment. In addition, the contamination resulting from the atmospheric releases has been sufficiently well characterized to support remediation¹ activities. Management of the remediation operations has slowly shifted from one of central emergency management control to one of more diversified, local and individualized control. This more local control for remediation operations is supported by the central government that is also providing financial assistance in order to improve living conditions in the contaminated areas. This shift from central control to more local control indicates the beginning of what the ICRP terms “the post-accident rehabilitation phase” or remediation phase after an accident (ICRP, 2009).

¹ Although the term recovery is the title of the Topical Session, for the purpose of clarity and to enhance communications with radiation protection professionals and stakeholders, this document will use the term remediation, except where specific presentations are cited. This action is being taken for consistency with the terminology used in the International Atomic Energy Agency (IAEA) “IAEA Safety Glossary” (IAEA, 2007).

Objective

Topical Session Objective

To identify remediation issues that the CRPPH can usefully study in the context of the Committee's mandate and competences, in coordination with on-going and planned work with other international organizations.

Topical Session Format

In support of the objective, the Topical Session included the following presentations:

1. Health Management and Remediation in the Fukushima Area
2. The ICRP Dialogue Initiative
3. National Views concerning Remediation Management
4. Expert Group on Radiological Protection Aspects of the Fukushima Accident (EGRPF) Recovery Management Survey Results
5. Discussion Session

This document provides the highlights of the listed presentations as well as the conclusions reached by the CRPPH in support of the above Topical Session objective to identify remediation issues that the CRPPH can usefully study in the future.

HEALTH MANAGEMENT AND REMEDIATION IN THE FUKUSHIMA AREA

The Japanese government and people of Japan are experiencing and facing many challenges in their remediation activities following the Fukushima accident. The Topical Session began with a presentation by the Radiation Health Management Office of the Japanese Ministry of the Environment (MoE) informing participants of their actions and experience in the management of persons exposed to radiation.

In June 2011, the Fukushima prefecture, with financial and technical support of the Japanese government, initiated the Fukushima Health Management Survey program. The objectives of the program are to: 1) investigate long-term, low-dose radiation exposures caused by the nuclear power plant accident; 2) monitor the long-term health of residents; 3) promote their future well-being; and 4) confirm whether long-term, low-dose radiation exposure has potential health effects. The program includes all the people living in the Fukushima Prefecture after the accident, which is estimated to be over 2 million people. The program features include a database of people's estimated radiation exposures, whole body counting and dosimeter records. There is also an integrated Health Status Assessment aspect to the program that includes thyroid ultrasound examinations, comprehensive health checks, mental health and lifestyle survey, and pregnancy and birth survey, with follow-up as needed. For more information on the Survey program go to: <http://fukushima-miamori.jp/>.

As part of the Survey program and due to the extensive mapping of radiation levels in the contaminated area over time, the external exposure of individuals is being estimated based upon their response to a questionnaire mailed out by the Fukushima Medical University. The questionnaire asks residents to provide information on their location and movements for the first four months following the accident and to identify activities that could have impacted their external exposure. By comparing individual's movements with the extensive mapping of radiation levels in the contaminated areas, estimated doses are developed and shared with the individuals. These doses, which provide more accurate estimates than what was previously projected, are helping to reduce the anxiety among residents and will be used for long-term health management. Radiation doses for a total of 394,369 residents have been estimated, through 31 January 2013. The results of these radiation dose estimates, excluding occupational radiation workers, suggest that the doses for 99.8% of the residents were less than 5 mSv and more than 99.9% were less than 10 mSv. The highest estimated resident dose, excluding radiation workers, was 25 mSv.

A whole-body measurements program for internal radiation exposures began 27 June 2011, for residents of Fukushima Prefecture. The whole body measurements are being conducted by the Fukushima Prefecture. By 31 March 2013, 123,050 persons have been measured. More than 99.9% have results less than 1 mSv, with a maximum of 3.5 mSv.

Based upon this data, the Health Management Survey program has concluded that radiation doses estimated so far are unlikely to cause adverse effects on health, although this

conclusion is based on effective doses estimated only for the first four months following the accident.

The Health Management Survey program has identified the following challenges for the future:

1. How should the long-term radiation exposure, both external and internal, be measured more accurately and effectively?
2. Which kind of health examinations should be performed and among which population?
3. Are thyroid cancer cases increasing?
4. Risk communication.

The Topical Session continued with a presentation by the MoE informing participants of their actions and experience in the conduct of remediation activities in the contaminated areas following the nuclear power plant accident at Fukushima. New legislation was passed to establish a framework for decontamination. This new legislation, the “Act on Special Measures Concerning the Handling of Radioactive Pollution (Act),” came into force 01 January 2012. Based upon the Act, the following activities are being carried out: 1) planning and implementation of decontamination work and 2) collection, transfer, temporary storage, and final disposal of decontamination waste. The Act also includes the designation of Special Decontamination Areas. These areas include 11 municipalities in the former restricted or planned evacuation zones which are less than 20 km from the nuclear power station or where annual cumulative dose is estimated to be greater than 20 mSv. Decontamination in these areas is implemented by the national government. Intensive Contamination Survey Areas have also been designated in 101 municipalities in 8 Prefectures in which the air dose rate is more than 0.23 $\mu\text{Sv/hr}$, which can be considered as over 1 mSv/year. The local municipality implements decontamination activities in these areas with the national government providing financial and technical support.

Decontamination activities are being conducted based upon air dose measurements. For areas where the air dose is less than 20 mSv/year, the long-term goal is to reduce additional dose to less than 1 mSv/year. For areas where the air dose is 20 to 50 mSv/year, the goal is to decrease the dose as much as possible. Demonstration projects will be implemented in areas with air dose levels greater than 50 mSv/year and lessons learned will be reflected in future decontamination actions and policy. For 2014 and beyond, the government will evaluate the two-year decontamination results, make appropriate adjustments and revise implementation plans, as needed.

The decommissioning program has estimated the scale for an interim waste storage facility to handle the waste resulting from remediation activities. The total interim storage volume is anticipated to be 15 to 28 million cubic meters (m^3), which is 12 to 23 times as big as a baseball stadium of approximately 1.24 million m^3 .

In summary, the challenges for the remediation program identified to date are:

1. Securing waste storage and disposal site or sites.
2. Enhancing the implementation system, including additional staff.
Identifying the future vision for the areas after decontamination.

THE ICRP DIALOGUE INITIATIVE

In April 2011, a month after the Fukushima accident, ICRP and representatives from Japan began discussions that resulted in the establishment of the Fukushima Dialogue Initiative (Fukushima Dialogue). Their vision for the Fukushima Dialogue was to develop a shared understanding of the role of the stakeholders in the remediation phase after the accident and to establish a forum for dialogue between all interested parties to find ways to respond to the challenges of the remediation program to improve the living conditions in the affected areas. Between November 2011 and March of 2013, five Dialogue meetings, involving a spectrum of stakeholders, have been conducted.

Features of the Fukushima Dialogue are:

- Transmission of the Chernobyl experience from Belarus and Norway
- Adherence to the principles in ICRP Publication 111
- Development of a radiation protection culture and self-help protection
- Adoption of a “co-expertise approach”
- Adoption of several styles of dialogue between stakeholders
- Progressive focus on practical issues associated with the accident and subsequent remediation
- Create a forum for dialogue with and for residents
- Diffuse information through the social media (e.g., web-based and Twitter)

The Fifth Fukushima Dialogue, conducted March 2013, identified the following recommendations:

1. National and local authorities should support and participate more actively in the Fukushima Dialogues.
2. Experts from all relevant disciplines should work together with the local communities to improve their living conditions.
3. Emergence of local facilitators to explain and diffuse practical radiation protection culture should be favored.
4. The objective and effectiveness of the decontamination program should be revisited with all relevant stakeholders.
5. The evacuees in their new location should be supported.
6. Local initiatives aimed at improving living conditions should be supported.
7. Infrastructure to favor sustainable social and economic activities in the affected areas should be developed.
8. Mechanisms to exchange experience on local initiatives and to diffuse good practices within affected areas and beyond, including sharing internationally, should be established.

These meetings have generated many recommendations and conclusions, both from a technical and societal perspective, to improve and enhance remediation activities.

NATIONAL REMEDIATION PROGRAMS

Next, several CRPPH members provided presentations on their national programs associated with responding to the remediation phase following a nuclear or radiological accident.

The United States Environmental Protection Agency (EPA) provided the first presentation. In 1992, the EPA published the “Manual of Protective Action Guides (PAGs) and Protective Actions for Nuclear Incidents” (EPA, 1992). A 2013 Draft update titled: “PAG Manual – Protective Action Guides and Planning Guidance for Radiological Incidents” (2013 PAG Manual) was published in April 2013 for public review and comment (EPA, 2013).

The 2013 PAG Manual includes a Chapter on Late Phase Recovery that provides guidance on recovery issues following a terrorist act as well as guidance for re-entry, cleanup and waste management in the event of a nuclear power plant accident. Some of the relevant features of the new 2013 PAG Manual are that it clarifies the use of PAGs for all radiological incidents including terrorism, lowers projected thyroid dose that would trigger the use of potassium iodide (KI), requests stakeholder input on drinking water guidance, and includes guidance for long-term site restoration. The document acknowledges that cleanup levels require consideration of the net health benefits to the exposed population and society in general. In this context, EPA recommends the formation of Working Groups to inform the decision making process. The Working Groups are recommended to include various technical experts, communications experts, and members of the affected population, Government agencies and public interest groups. Four groups are recommended to be established to work collectively and in a step-wise process to aid in the decision making process: A Decision Team made up of senior local, state and federal officials; a Recovery Management Team made up of senior leadership in the field recovery effort; a Stakeholder Working Group made up of community leaders, local businesses, nongovernmental representatives, and members of the public; and a Technical Working Group made up of select subject matter experts and communicators.

Guidance on dealing with waste generated as a result of a nuclear or radiological incident is also provided in the 2013 PAG Manual. The document focuses on options for disposal, recognizing that in the United States, it is the individual State where the accident occurred that would have the primary responsibility for dealing with the waste. Options for disposal of such waste include: an existing low-level waste disposal facility; solid and hazardous waste landfills; Federal facilities or sites; or newly developed disposal capacity. Decision making on the selection of the site is recognized as being driven by the waste volume as it could overwhelm existing disposal capacity for radioactive waste. The 2013 PAG Manual recommends that waste disposal be considered in the early phase of emergency planning. Development of a plan to deal with waste management is recommended and should include the management of initial debris, waste staging, waste characterization, waste segregation, waste treatment and finally waste disposal. The 2013 PAG Manual also includes reference to many tools that EPA has developed to assist in the management of waste and demonstrating compliance with agreed upon cleanup criteria.

Next, the French highlighted their national program for responding to the post-accident or remediation phase of a nuclear or radiological accident. In June 2005 the Autorité Sûreté Nucléaire (ASN) established a Steering Committee on Post Accident Management (CODIRPA) to manage the post-accident phase of a nuclear accident or radiological emergency and develop the elements of a national policy on post-accident management. The presentation stated that the goal of CODIRPA is to prepare provisions to address the complex problems of post-accident management, in particular those relating to health

management of populations, economic consequences and rehabilitation of living conditions in contaminated areas. Since 2005, 11 working groups, bringing together about 130 experts from different backgrounds have been formed. CODIRPA sets the general objective and coordinates the working groups. It validates the specifications and work as well as reviews the elements of policy developed by the working groups. This has led to the development of elements of the first national policy and program for post-accident management. For more information see www.french-nuclear-safety.fr.

In November 2012, ASN published its “Policy Elements for Post-Accident Management in the Event of a Nuclear Accident” (ASN Policy Document). The main document provides objectives, principles, key actions and strategic orientations for the transition and long-term phases after an accident. There are also three Annex’s: Annex 1 describes the first actions to be put in place at the end of the emergency phase; Annex 2 provides guidelines for managing the transition phase, the few months after the accident in the post-emergency phase; and Annex 3 provides guidelines for managing the long-term period which could extend for several years. The document is available at www.asn.fr and translations are available in English and Japanese, with a Russian translation available in the near future.

The ASN Policy Document has three fundamental and strongly connected objectives:

1. Protecting the population against the dangers of ionizing radiation.
2. Providing support for members of the population who have suffered the consequences of an accident.
3. Preparing the social and economic recovery of the affected areas.

The ASN Policy Document also makes six key points with respect to post-accident management in the event of a nuclear or radiological accident:

1. Immediate delineation of a Protective Action (PA) zone for the contaminated area, with an evolution during the transition period.
2. Medical and psychological care, radiation monitoring, financial support and compensation for those affected by the consequences of the accident.
3. Radiological characterization and surveillance of the environment, foodstuffs and drinking water.
4. Rapid implementation of a specific approach to management of foodstuffs and drinking water.
5. Emergence of new forms of governance based on the vigilance and active participation of the affected population is considered as a key point for economic recovery within affected areas.
6. Sustainable waste management solutions in response to the rapid increase in the volume of contaminated wastes.

The ASN Policy Document also designates Zones for the protection of the public based upon potential exposures and contamination levels in foodstuffs. During the period 2013 through 2018 CODIRPA has three objectives: 1) test and complete the post-accident policy; 2) implement the provisions for post-accident management of the outer zone at each nuclear power plant site; and 3) exchange experience and information with neighboring countries and international organizations.

The final national program to be highlighted was that of the United Kingdom (UK). The program to respond to all emergencies in the UK is titled; “UK Resilience,” and details can be found at <https://www.gov.uk/government/policies/improving-the-uks-ability-to-absorb-respond-to-and-recover-from-emergencies>. Included in the program are “National Recovery Guidance”, a “Recovery Plan Guidance Template” and a three volume “UK Recovery Handbook for Radiation Incidents: 2009, Version 3” (HPA, 2009). The three volumes in the UK Recovery Handbook are: “Drinking Water Supplies”; “Inhabited Areas”; and “Food Production Systems”; and provide guidance as appropriate to their subject. The presentation also shared lessons learned from the implementation of their program in response to

radiological incidents. Lessons learned from the Polonium-210 contamination incident in London, November 2006, included the need to develop a remediation protocol, better define when recovery starts, difficulty in finding waste sites and the need for a communications strategy. In order to efficiently respond to the polonium contamination incident, special legislation had to be passed to expedite the selection of a waste disposal site.

In response to the polonium contamination and the Chernobyl and Fukushima accidents the recovery or remediation from incidents involving radioactive contamination are part of the wider UK resilience framework and recovery or remediation is now part of the UK emergency exercise program.

EXPERT GROUP ON RADIOLOGICAL PROTECTION ASPECTS OF THE FUKUSHIMA ACCIDENT RECOVERY MANAGEMENT SURVEY RESULTS

At the 70th meeting of the CRPPH, in March 2012, it was agreed that the Expert Group on Radiological Protection Aspects of the Fukushima Accident (EGRPF) should conduct a survey of member and adjacent countries emergency management and recovery or remediation management programs and lessons learned. The Recovery Management survey asked a number of questions on the following specific issues: Return to evacuated areas; clean-up criteria; management of decontamination wastes; communications issues; education; and building an effective radiological protection culture. Thirteen countries provided responses to the Recovery Management survey. See Appendix 1 for the list of thirteen responding countries and the Recovery Management survey.

From a review of all the EGRPF survey responses the following general conclusions can be drawn:

- Recovery planning for the later phase after an accident has been less of a focus than emergency planning for the early phase.
- Decontamination wastes were broadly identified to be placed in temporary storage, but decisions on final disposal were not part of planning in any country.
- Stakeholder involvement in recovery is viewed as decision aiding with regard to national or regional decisions.
- Much of the post accident provisional aid was focused on providing information to the affected populations.
- Government support for self-help initiatives was broadly characterized as providing information, not on supporting initiatives by the affected individuals.

COMMITTEE ON RADIATION PROTECTION AND PUBLIC HEALTH OPPORTUNITIES FOR FUTURE STUDY

The final portion of the Topical Session was an open discussion in support of the objective to identify remediation issues that the Committee on Radiation Protection and Public Health (CRPPH) can usefully study in the context of the Committee's mandate and competences, in coordination with on-going and planned work with other international organizations.

Based upon the previous presentations and CRPPH member's experiences, a lively, extensive and productive session of discussion was conducted. The discussion resulted in the identification of the following seven activities that should be considered by the CRPPH in order to make a contribution to the advancement of remediation activities following a nuclear or radiological accident:

National Remediation Strategy. The development of a national remediation strategy framework would assist CRPPH members to focus attention on this important topic. The UK program, as described above, could provide an initial starting point for the development of a framework document that other countries could use to ensure that all important topical areas are addressed in their national remediation plans.

Legislation. The identification of legislation that should be in place to deal with the many issues that will arise during the emergency and remediation phase of an accident (e.g., waste disposal, land use, decontamination levels) would assist CRPPH members and others to evaluate the need for additional national or local legislative action.

Communications Strategy. Communications during and after an emergency or accident continues to be a significant challenge. It has again become even clearer after the Fukushima accident that the preparation of a short- and long-term Communications Strategy, in advance of an emergency or accident, would be of significant help. Due to its extensive experience in this area, the CRPPH is well positioned to provide tools and templates that would assist in the development of Communications Strategies, particularly for the Remediation Phase when stakeholder involvement is of particular importance.

Self-Help Protection Activities. During the Remediation Phase following an accident a key activity for the improvement of living conditions is the identification of and support for self-help activities by the affected population. These activities are encouraged by ICRP who also recommended that governmental support for these activities be established (ICRP, 2009). Of particular interest is bridging the gap between self-help activities by the affected population, governmental authority and the role of the radiation protection professional in these interactions. The CRPPH is uniquely positioned to provide additional guidance to affected populations and governments on the identification and implementation of effective self-help activities.

Stakeholders Role in Decisions. Stakeholder involvement is important in all aspects of emergency planning and particularly in response and remediation from an accident. Stakeholder's level of involvement is impacted by many factors (e.g., legal, cultural). Despite that, stakeholders will want to be involved and have a role during the remediation phase after an accident in order to get their issues addressed and improve their living conditions. Due to the extensive experience with stakeholder involvement, the CRRPH is well positioned to hold discussions and document

best practices on national approaches to the development of and stakeholder involvement in decisions such as the return to evacuated areas, clean-up criteria, temporary waste storage and disposal, communications strategies and support for self-help initiatives (CRPPH, 2010).

Lessons Learned and Knowledge Management. Since 1986, a great deal has been learned from the remediation phase following the Chernobyl accident. Many in the radiological protection profession today were young professionals at the time of Chernobyl accident. Based upon their personal, past experience they are providing assistance to the Japanese people and government during the remediation phase of the Fukushima accident. Based upon its activities in over 25 years in this area, the CRPPH is well positioned to collect and document the lessons learned during the remediation phase of the Fukushima accident for use in the development of national programs and to inform future generations of radiological protection professionals.

Harmonize Terminology. Since the March 2011 Fukushima accident, there has been increased interest to provide information and guidance on the later or remediation phase after a nuclear or radiological accident. Because of the various number and types of international and national organizations involved with these activities, there has not been a consistent use of terms. Some of the terms that are currently being used to just describe the later phase activities include terms such as post-accident, recovery, remediation, restoration, and rehabilitation. In the interest of enhancing effective communications within the radiological protection profession and with stakeholders, the terminology to describe this phase of activity and its associated actions should be harmonized. The CRPPH could team with the international bodies, including the IAEA that has published a nuclear safety glossary (IAEA, 2007), to harmonize the terminology. The CRPPH Members could then reflect the agreed upon terminology in their national programs.

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Appendix 1

Recovery Management Survey and Responses

Survey

The Recovery Management Survey included the following 16 questions, divided in five sections:

EGRPF Survey on

National Experiences in identifying Recovery Management Lessons from Fukushima NPP Accident

The Fukushima accident has resulted in safety reviews being conducted in all NEA member countries with operating nuclear power plants. Results have been reported in different areas, including some findings in the fields of emergency and recovery management. The NEA, through its standing technical committees has initiated activities to support learning lessons through different mechanisms and in line with its modified program of work. As part of this, the CRPPH agreed that the Working Party on Nuclear Emergency Matters (WPNEM) and the Expert Group on the Radiological Protection Aspects of the Fukushima Accident (EGRPF) should conduct a survey of emergency management and recovery management lessons learned. The WPNEM portion of the survey focuses on emergency management aspects, while the EGRPF portion of the survey focuses on recovery management aspects. The two surveys are being sent simultaneously to all CRPPH and WPNEM members, and it is expected that coordinated national responses will be returned to both surveys. It is also expected that the WPNEM membership will be more focused on the emergency management aspects of these surveys, while the CRPPH membership will be more focused on the recovery management aspects of these surveys.

We kindly ask you to provide the NEA Secretariat with relevant information by answering the following questions. We would appreciate if you could return the filled questionnaire by mid-March 2013.

Thank you in advance for your co-operation and contribution.

NEA member country	
Responding organisation	
Contact details	

For many countries completing the following survey, responses will be based on hypothetical situations and organizational planning. However for a few countries responses will be based on real radiological accident experiences (e.g. Japan - Fukushima, UK- Polonium incident). As such, where possible, please indicate the basis of your response (i.e. experience of real radiological event, experience of real non-radiological event, on plans for hypothetical but relevant scenarios, etc.)

Return to evacuated areas

The decision to allow evacuees to return to their homes and work is a key recovery decision. The following questions relate to the basis, in your country, on which these decisions are made:

1. Has your country identified the organizations responsible for such decisions, and is a process for making such decisions in place Yes / No?
2. Are the organizations responsible for this decision (or those responsible for advising the decision makers) reconsidering their approach as a result of lessons from the Fukushima accident: Yes / No?
3. Do you think predefined criteria are needed at the preparation stage for taking such a decision Yes / No? If yes, do you already have such criteria in place Yes / No?
4. On what basis (i.e. predefined criteria) or approach (i.e. stakeholder process) would a decision be taken to allow evacuated families to return to their homes?
5. On what basis (i.e. predefined criteria) or approach (i.e. stakeholder process) would a decision be taken to allow public facilities in evacuated areas to operate? Is there a distinction between public service facilities (e.g., utilities, fire and police stations) and public facilities (e.g., schools, stadiums)?
6. On what basis (i.e. predefined criteria) or approach (i.e. stakeholder process) would a decision be taken to allow private businesses in evacuated areas (i.e. shopping centers, stores, offices, etc.) to operate?
7. How are stakeholders involved in the making of these decisions regarding the circumstances under which they should be allowed to return after evacuation? If stakeholders are involved, would you characterize this as decision making or decision aiding?

Cleanup criteria

The extent to which sites should be decontaminated will be a key question for off-site, post-accident management. The following questions relate to your country's plans for the development of criteria for decontamination, of an approach to decontamination, or other procedures that would be used to decide when cleanup has been achieved. The answer to this question may be linked to the answers to the previous two questions.

8. Has your country identified the organizations responsible for such decisions, and is a process for making such decisions in place Yes / No?
9. What criteria, or approach, have you planned with respect to determining the objectives of contamination cleanup?
10. How are stakeholders involved in the making of these decisions?

Management of decontamination wastes

It is likely that large volumes of contaminated waste will be generated by off-site decontamination activities. The following questions relate to your country's plans for the managing of such solid and liquid wastes.

11. Has your country identified the organizations responsible for making decisions on the management of wastes, and is a process for making such decisions in place Yes / No?

12. What is your planned approach (e.g. temporary storage, long-term storage, disposal, what sites, etc.) with regard to managing the large volumes of solid contaminated waste (e.g. soil, building materials, etc.) that would be expected from decontamination activities?
13. What is your planned approach (e.g. collection, storage, treatment, etc.) with regard to managing large volumes of liquid contaminated waste (e.g. water used for washing surfaces) that would be expected from decontamination activities?
14. How are stakeholders involved in the making of these decisions?

Communication issues (i.e. to the public, to elected officials, to upper management)

Many post-accident recovery decisions will take stakeholder involvement and inputs into account, but will need to be broadly presented and communicated once taken. It will be useful to have in place a planned communications strategy for the presentation of such decisions within organisations, within government, and to the public.

15. What communication strategy(ies) do you have planned for post-accident recovery decisions?
16. What stakeholders would be involved in developing communications strategies for post-accident recovery decisions, and how would they be involved?

Education, information and building effective radiological protection culture

Populations in contaminated areas will need a practical understanding of radiation and radiation risk, and practical advice as to self-help behaviour in order to manage their own exposures and those of their children. An understanding of radiological risks will also be needed even in non-contaminated areas in an affected country.

17. What radiological protection and self-help support information / educational material / equipment for public use is foreseen for post-accident situations in your country, and by what means would this be provided?
18. How are stakeholders involved in the development of such materials?

Survey Responses

The thirteen CRPPH member and adjacent countries that provided responses to the below Recovery Management Survey were: Canada, Czech Republic, Finland, France, Germany, Ireland, Japan, Korea, Luxembourg, Romania, Slovak Republic, Sweden and Switzerland. A summary of national responses is provided here.

Return to evacuated areas

1. Has your country identified the organizations responsible for such decisions, and is a process for making such decisions in place Yes / No?

Summary of Responses:

All countries answered 'Yes' or 'Partially yes'.

'Partially yes' means

- Specific organization and process for making such decisions has not yet been elaborated.(Canada, Finland)
- Making decisions are identified by local government(France) .
- Process is under revision.(Luxembourg)

2. Are the organizations responsible for this decision (or those responsible for advising the decision makers) reconsidering their approach as a result of lessons from the Fukushima accident: Yes / No?

Summary of Responses:

Most of all countries answered 'Yes'.

- Czech will be considered.
- In the case of Slovakia, NRA answered Yes, while PHA answered No.
- Answered "No": Ireland and Korea
- Ireland is not anticipated as a protection action because there are no nuclear facilities (or within 100Km of its borders).

3. Do you think predefined criteria are needed at the preparation stage for taking such a decision Yes / No? If yes, do you already have such criteria in place Yes / No?

Summary of Responses:

All countries answered that "Predefined criteria are needed at the preparation stage for taking such a decision".

The countries which

- already have such criteria are ; Czech, Finland, Luxembourg, Sweden and Slovakia(Although PHA answered NO). (5 countries)
- is currently in progress are; Canada, France, Germany (3 countries)

Answered "No": Ireland, Japan, Korea, Romania and Switzerland (5 countries)

- Ireland is not anticipated as a protection action because there are no nuclear facilities (or within 100Km of its borders).
- The Japanese government states that the designation should promptly be rearranged depending on changes in the situation, such as the confirmed safety of the NPS or the reduced risk of radiation exposure to residents, on the major premise of ensuring safety and reassurance of the residents. The government has decided to rearrange the restricted areas and areas to which evacuation orders have been issued after the safety of the NPS was ensured by completion of Step 2 on December 26, 2011.

And the areas to which evacuation orders have been issued are rearranged into 3 areas responding to the annual cumulative doses.

- Switzerland states that the criteria should be discussed with stakeholders and precise in the revision of the emergency and response ordinance.

4. On what basis (i.e. predefined criteria) or approach (i.e. stakeholder process) would a decision be taken to allow evacuated families to return to their homes?

Summary of Responses:

Most of all countries answered that "A decision will be taken based on facts (i.e. dose rate and risk)".

- The decision would be taken by regional and municipal authorities.(Canada and Czech)
- the government will lift evacuation orders in the areas through extensive talks with prefectural and municipal governments and residents after confirming the sufficient advancement of the general restoration of essential infrastructure, such as electricity, gas, tap and sewage water systems, main roads, and communication facilities.(Japan)
- Decision are to be taken based on the evaluation of radiological situation and criteria, which are set down in a governmental order No. 345/2006 on safety requirements(Slovakia)
- 10 countries answered that A decision would be taken with stakeholders.

5. On what basis (i.e. predefined criteria) or approach (i.e. stakeholder process) would a decision be taken to allow public facilities in evacuated areas to operate? Is there a distinction between public service facilities (e.g., utilities, fire and police stations) and public facilities (e.g., schools, stadiums)?

Summary of Responses:

The countries answered that

- there is (or will be) a distinction between public service facilities and public facilities are; Canada, Ireland, Japan Korean, Romania(5 countries)
- there is NOT a distinction are; Finland, France and Slovakia(3 countries)
- will be considered are Czech, German, Lux, Sweden and Switzerland (5 countries)

6. On what basis (i.e. predefined criteria) or approach (i.e. stakeholder process) would a decision be taken to allow private businesses in evacuated areas (i.e. shopping centers, stores, offices, etc.) to operate?

Summary of Responses:

The countries answered that

- would be taken to allow private businesses in evacuated areas are; Finland, France, German, Japan and Slovakia (5 countries).
- under discussion are; Canada, Czech, Ireland, Korea, Lux, Romania, Sweden and Switzerland.(8 countries)

7. How are stakeholders involved in the making of these decisions regarding the circumstances under which they should be allowed to return after evacuation? If stakeholders are involved, would you characterize this as decision making or decision aiding?

Summary of Responses:

- The level of involvement would likely be classified as decision aiding since the stakeholders would need to rely, in part, on the technical advice and oversight of expert organizations and government organizations in order to make informed interventions. However, the responsibility for making decisions will likely reside with responsible authorities.(Canada)
- the stakeholders have right to be heard in all such large-scale authority decisions that affect them, so they would have an opportunity to present their opinions before the decision.(Finland)

- can set out to address the future of the said territories, alongside the public authorities.

This process requires:

- a sufficiently precise knowledge of the radiological situation of the environment, food and people so that the various stakeholders can effectively protect themselves (this knowledge will further improve with time);
- public authorities reorganized into a adapted configuration (even if it is likely to change depending on the circumstances);
- stakeholders being involved in the decisions and actions of rehabilitation of living conditions, from the preparation phase;
- the conditions needed to redeploy social and business activity and the development of a shared project within the territory.
- it is important that decision-makers implement a territorial projects in order to quickly give to the populations the means to optimise their economic, social and cultural activities.

The definition of a framework for managing contaminated areas should articulate, on one hand, the policy elements defined at the national level and whose definition has involved many stakeholders at the preparedness stage, and, on the other hand, the territorial issues raised by local stakeholders. It would thus be considered as a co-construction rather than a decision making. (France)

- The actions such as the designing of the areas by the rearrangement and lifting of evacuation orders in the areas, would be taken through extensive talks with prefectural and municipal governments and residents.(Japan)
- Only governmental stakeholders and political decision makers are implied in these processes. It could be considered as a kind of decision aiding.(Luxembourg)
- Decision making would be made on an national level by National Central Crisis headquarters as well as by county emergency headquarters which consist of relevant representatives, these are decision making bodies. These bodies have a technical and expert support from emergency response centre run by Nuclear Regulatory Authority.

Clean-up Criteria

8. Has your country identified the organizations responsible for such decisions, and is a process for making such decisions in place Yes / No?

Summary of Responses:

The countries answered that

- -have identified the organizations responsible for such decisions are; Czech, Finland, France, Ireland, Japan, Lux, Romania, Slovakia(While PHA answered NO) and Sweden (9 countries)
- -have NOT identified the organizations responsible for such decisions are; Canada, Korea and Switzerland(3 countries)
- However, there are current efforts to address this level at the national level.(Canada)
- in progress is Germany (1 county)

9. What criteria, or approach, have you planned with respect to determining the objectives of contamination cleanup?

Summary of Responses:

The criteriaa of most of countries is based on does.

- Japan and Slovakia have an act concerning decontamination.
- Japan appears the detail as above.

- Sweden agreed the preliminary criteria between the Nordic countries and arrange these activities.
- Korea and Lux have no criteria.

10. How are stakeholders involved in the making of these decisions?

Summary of Responses:

The responding countries had different approaches:

- Stakeholders are involved in Finland, France, Germany, Japan, Slovakia and Sweden(6 countries)
- The stakeholders had the opportunity for public comment on the draft of the Basic Principles under the Act before it is formulated. (Japan)
- Stakeholders are involved in the decisions making by their involvement in the emergency headquarters of communities(Slovakia)
- Stakeholders are involved in the sense that they are informed and views are collected (little experience apart from the fall-out of radiocaesium over Sweden after the Chernobyl accident – deep ploughing and other techniques were used but no decontamination of large areas) (Sweden)
- No process to involve stakeholders are used in Korea or Luxembourg (2 countries)
- Countries that are in the process of implementing stakeholder involvement are Romania and Switzerland (2 countries)
- Stakeholder involvement will be discussed in the Czech Republic (1 country)
- Canada is well established for planning of the consequence management phase but stakeholder involvement remains a matter under consideration for the recovery phase. No decision has yet been made regarding the transition from one phase to the other and the impact on stakeholders' involvement.
- Ireland reported that it expects that stakeholder involvement would be situation dependent.

Management of decontamination wastes

11. Has your country identified the organizations responsible for making decisions on the management of wastes, and is a process for making such decisions in place Yes / No?

Summary of Responses:

All countries except Korea answered "Yes".

- Regarding to Slovakia, NRA answered "Yes", while PHA answered "No".

12. What is your planned approach (e.g. temporary storage, long-term storage, disposal, what sites, etc.) with regard to managing the large volumes of solid contaminated waste (e.g. soil, building materials, etc.) that would be expected from decontamination activities?

Summary of Responses:

- four categories exists. Depending on the category of the waste, recycling into landscaping material, temporary storage, long-term storage and disposal on landfill or new sites are all foreseen as possible approaches. Additionally, the waste is expected to be sorted as well as possible into the aforementioned categories according to the activity and type of the waste.(Finland)
- This waste must be temporarily stored under specific conditions, to be implemented gradually. However, exceptional provisions may be allowed from the termination of the emergency phase, when putrescible waste cannot be stored (e.g.: milk dilution and destruction), nonetheless taking into account the vulnerability of the ground and water resources.(France)

- The Basic Principles for Interim Storage Facility (the roadmap) that refer to the way of the management in Fukushima prefecture was officially announced by the Ministry of the Environment in October, 2011. (Japan)
- used are the subject of county off-site emergency plans (Slovakia)
- Temporary storage until decision on permanent disposal site(Sweden)
- Temporary storage in the Federal storage center (ZWILAG) and use of other possible existing storage capacities(Switzerland)
- Ongoing; Canada,
- Will be discussion; Czech, Lux
- No definite; Germany, Ireland, Korea

13. What is your planned approach (e.g. collection, storage, treatment, etc.) with regard to managing large volumes of liquid contaminated waste (e.g. water used for washing surfaces) that would be expected from decontamination activities?

Summary of Responses:

Most of countries don't have definite plans, except:

- For specific locations where large amounts of activity is expected (such as decontamination sites of emergency vehicles entering contaminated areas), collection and treatment are possible. (Finland)
- For operational purposes the waters used for decontamination would not be collected.(France)
- Basically to limit the volume, to collect them and to treat them if possible in sewage plants (Germany)
- The national government requires the contractors of decontamination works to take the following measures for preventing the scattering and outflow of the water used for washing surfaces. (Japan)
- It is planned to collect contaminated water from individuals clean-up in large volume containers and vessels, Clean-up facilities have technical arrangements to retain contaminated waters. The water coming from clean-up of terrain (roads, pavements...) is not planned to be collected.(Slovakia)

14. How are stakeholders involved in the making of these decisions?

Summary of Responses:

- Participation in a Public Commission Hearing where the licensee is provided an opportunity to be heard, the public and interested stakeholders can participate as interveners and present their interventions.
- Participation in the public comment process for draft regulatory documents or proposed regulatory amendments (e.g. radioactive waste decision making).
- Participation in an Environmental Assessments of proposed regulated activities.
- Participation in CNSC community outreach activities. (Canada)
- Stakeholders would be involved in the licensing process, even if it would be conducted as expeditiously as possible. (Finland)
- The stakeholders had the opportunity for public comment on the draft of the Basic Principles under the Act before it is formulated. Besides, when the national government intends to formulate the plans related to decontamination, the government has held briefing sessions in advance to hear the opinions of the residents. (Japan)
- The national and county emergency headquarters consist of all relevant stakeholders representatives who participate in the process of decision making either on national or county/local level.(Slovakia)

Communication issues
(i.e. to the public, to elected officials, to upper management)

15. What communication strategy(ies) do you have planned for post-accident recovery decisions?

Summary of Responses:

- Provincial/territorial authorities have primary responsibility for health, safety and environment within their borders, including with respect to public communications.(Canada)
- a regular meeting of emergency managers would have an important role. In addition to mass media, STUK and other actors would provide a call centre for answering questions from organizations, businesses, and public and provide information on the measures through social media.(Finland)
- Public communication shall be structured around six major topics of information, covering: the restrictions to be adopted (instructions), health-related and environmental topics (impacts, risks, contamination), technical topics (explanation of the event, safety of the facility where the accident took place), topics of legal and economic nature (grants, compensation), “political” messages (national cohesion), and international relations (export, citizens abroad). (France)
- Use, insofar as is possible, existing channels of communication/stakeholder groups in place for other purposes (e.g., industry liaison groups(Ireland)
- See above (Japan)
- Periodic information in enterprise and establishment newspapers and in local press newscasts media (radio, TV and telefax),
 - presentations in schools, communities and organizations,
 - display posters with information located on public places
 - yearly distribution of information materials directly to households
 - distribution of information materials to hotels, accommodation facilities, shopping centers health facilities (Slovakia)

16. What stakeholders would be involved in developing communications strategies for post-accident recovery decisions, and how would they be involved

Summary of Responses:

What stakeholders?

- national government and Municipal authorities(Canada, Czech, Germany, Japan,Lux, Romania and Sweden)
- many professionals (France)
- journalists (Germany)
- residents(Japan)

How would they involved?

- the communication strategies(Canada)
-
- taking into account the most common questions and concerns that would be received via phone service, web pages and social media.(Finland)
-
- new communication tools, such as social networks, would also be an important component of the communication strategy, with the involvement of corresponding stakeholders.(France)
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