Outcome from the ICRP Working Party on Business affected by Emergencies

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Following the Fukushima accident

- Significant economic disruptions with effects extending over years and impacting the whole region of Fukushima and beyond;
- In addition to the direct economic impacts, socio-economic actors experienced various difficulties;
- Lack of technical supports from radiological experts as business activities have not been broadly considered in the implementation of the RP system.

In 2017, creation of a dedicated working party on ‘Business interest’, as part of the ICRP C4
Elaboration of relevant recommendations to better accompany the economic activities in the implementation of the RP system

Identification of the main issues at stake for economic activities:

- The preservation of their activity;
- The management of employees and their families in terms of radiological protection;
- The quality assurance process of their products;
- The loss of image of their products and consumer boycott.

Inputs in the updated version of ICRP Publications 109 & 111
Feedback analysis from 6 case-studies:

- **Iitate** – non-evacuated company which was authorized to continue its activity.
- **Namie** – Quarry contaminated during the emergency phase, which had impacts on the long-term phase.
- **Tomioka** – evacuated company whose return had to be managed and organized.
- **Iwaki** – company located on the border of an evacuation zone.

- Case of the forest and the wood sector
- Case of the tourism
PRESERVATION OF THE ACTIVITY

Case of a non-evacuated company in Iitate
- Plant producing electronic components decided to pursue its activity although the village was evacuated.

Case of an international company at the border of the evacuation zone, in Iwaki
- Decision to continue the activity despite some questioning about RP issues.

Case of an evacuated company in Tomioka
- To progressively restart the economic activity, agreement to open the company during the day time before the lifting of evacuation order.

Case of the quarry in Namie
- The quarry was operated until April 22, 2011, before being declared as part of the evacuated area.
THE MANAGEMENT OF EMPLOYEES AND THEIR FAMILIES (1/2)

Case of a non-evacuated company in Iitate

- Key concern of employees about their exposure, not only at their workplace but also in their personal home;
- Distribution of individual monitoring devices 2-3 years after the accident.

Case of an international company at the border of the evacuated zone, in Iwaki

- No clue on RP issues at the time of the accident, collaboration with Nagasaki University;
- Development of a monitoring programme (e.g. external exposure, WBC, food monitoring) for the workers and their family;
- Training of health professionals to be in charge of the long-term follow-up.
The Management of Employees and Their Families (2/2)

Case of an evacuated company in Tomioka

- Lack of devices and information for monitoring the workers;
- Application of the same radiological criteria than for housing;
- Support from the trade and industry committee, but no significant support for radiological protection issues;
- After the lifting of evacuation order, provision of individual monitoring devices (D Shuttle) by the municipality office but nothing for the workers themselves.
THE QUALITY ASSURANCE PROCESS (1/2)

Case of a non-evacuated company in Iitate

- Detection of contamination at the time of shipment of the products in the Iwaki harbour;
- Contamination concentrated on transport packages;
- Replacement of packages and certification of the absence of contamination for the electronic components.

Case of the quarry in Namie

- Heterogeneous contamination of the materials during the emergency phase;
- Identification of 940 sites having received aggregates from the Namie quarry, causing ambient dose rate up to 1.24 µSv/h in new buildings;
- Definition of a radiological criteria for the aggregates shipment: <100 Bq/kg (Cs).
THE QUALITY ASSURANCE PROCESS (2/2)

Forest and wood sector

- Massive contamination of the forest areas;
- Multiple uses of wood and forest: building materials, firewood, paper industry, furnishing and decoration materials, place of leisure, etc.
- Which radiological protection criteria to apply? How to adapt to the various sectors?
- How to ensure the traceability of the materials?
LOSS OF IMAGE AND CONSUMER BOYCOTT

Case of an international company at the border of the evacuated zone, in Iwaki

- Main concern of the international board to avoid boycott of the product;
- Pro-active communication and cooperation at the local and international levels to promote the quality of the management of RP issues, including quality of the production.

Tourism

- What support for maintaining/recovering tourism activities?
- How to provide understandable information to the tourists and help them to make informed decision about their venue in affected areas?
Some considerations on the RP principles

- **Justification**
  - Maintenance/recovery of economic activities in evacuated areas?
  - Marketing of products and use of a contaminated environment?

- **Optimisation**
  - Need to characterize the radiological situation and to set up **reference levels** allowing (i) life/work in contaminated areas and (ii) sale of products from contaminated areas.
  - What evolution of the reference levels over time?

Management of workers following a nuclear accident

- **Which information and training to provide to the workers** and what is the employer's responsibility?
- Key role of the RP culture.
A necessary radiological monitoring/surveillance

- for **protecting the public** notably concerning the use/consumption of products from the contaminated areas;
- for **workplace management**;
- for **health surveillance of employees**.

Ethical considerations

- Ensure **access to information** for all the concerned actors and promote informed decision-making processes;
- Undertake a **joint assessment of the situation** involving all stakeholders;
- Organize the **long-term vigilance**;
- Ensure **fair arrangements** between the different affected areas, the different publics, etc.
HOW TO BE BETTER PREPARED? (1/2)

Some recommendations from the CONFIDENCE European research project

Further develop decision support tools integrating potential economic impacts of protection strategies

➤ Based on feedback analyses, develop models to calculate direct and indirect costs and further elaborate risk / benefit analysis elements for various sets of rehabilitation scenarios taking into account local and national sensitive issues.

Consider the needs of socio-economic actors to promote early resumption of economic activities

➤ Based on practical case studies, discuss with local socio-economic actors to gather their expectations and needs to resume their activities rapidly after a nuclear accident.
Some recommendations from the TERRITORIES European research project

Engage dialogue with local stakeholders to better address the notion of “affected community” and anticipate post-accident provisions

- Initiate a local-national multi-actor dialogue to identify the socio-economic issues of the potentially impacted regions and see how to adapt protection strategies in accordance with the local vulnerabilities and local needs.

Better understand the financial mechanisms that can help the affected community

- Review existing financial support mechanisms allocated to compensation and revitalisation and analyse, together with the socio-economic actors, the relevance of these financial mechanisms with the local challenges.
THANK YOU FOR YOUR ATTENTION!