

Radiological Protection
2022

Building a Framework for Post-Nuclear Accident Recovery Preparedness

National-Level Guidance



NEA Workshop on Preparedness for Post-Nuclear Accident Recovery

Exercising post-accident recovery

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EGRM Report:

- *“Exercising is an important step in testing planned arrangements (...). A planned programme of exercises should seek to test the resilience of plans and arrangements (...)”* (p. 46)
- National exercises currently focus mostly on emergency phase, need to include recovery exercises;
- Exercising as important step to feed into recovery plans and to improve them;
- Improved coordination between recovery actors in a holistic approach possible through such exercises: clear determination of roles and responsibilities;
- Try to involve diverse stakeholders in recovery exercises;
- Potential cost-savings in a real situation due to thorough preparedness can be significant.

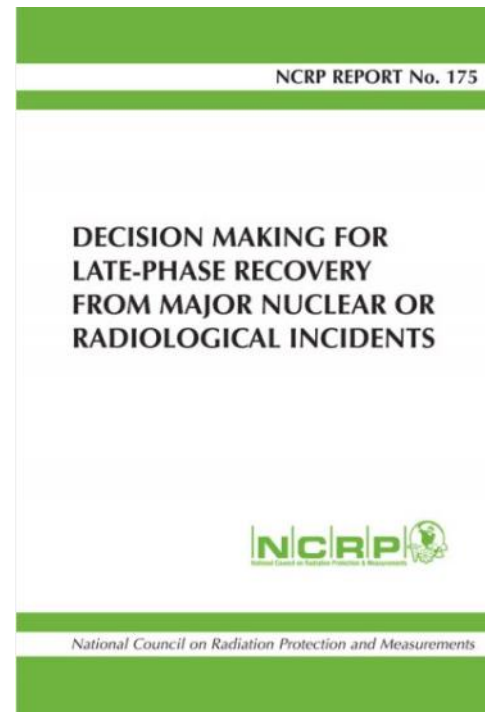
Annex A: “Checklist for Organising a Recovery Exercise (p. 75):

Step	Description
A) Identify exercise requirement	<p>a) Decide whether the primary purpose is to provide training or test recovery framework; decide whether it is necessary to test some recent change to a particular aspect of the recovery framework</p> <p>b) Strategic considerations: how it fits into the planned programme of exercises; how it helps to test across the range of scenarios and scales; how arrangements between relevant organisations/stakeholders/nations are tested</p>
B) Develop specifications (identify exercise objectives, scope, structure, constraints)	<p>a) Set clear exercise objectives and share these with participants: decide what (at minimum) the exercise should achieve; if its purpose is performance evaluation, consider setting key performance indicators based on recovery objectives TIP: Avoid being overambitious in the number of recovery objectives tested in a single exercise. It is preferable to focus on those areas which are key or have been weak in the past</p>
	<p>b) Decide the scope:</p> <ul style="list-style-type: none"> i) which participants will be invited and what will be the extent of their involvement; and whether it is possible to involve stakeholders not usually involved; participants required will partially depend on the objectives to be tested ii) what will be the time and duration of the exercise iii) if there are recovery subgroups, whether co-ordination between subgroups will be exercised
	<p>c) Decide the structure:</p> <ul style="list-style-type: none"> i) Full or Modular? If modular, identify modules to be tested and involvement in modules etc. ii) Simulated or table-top? Simulated exercises have the advantage of being closer to reality but table-top can be more cost-effective or more practical in some situations
	<p>d) Identify the constraints: what limitations will affect the exercise design; which factors (such as practical limitations) will be accepted and which will be mitigated</p>
C) Develop scenario	<p>a) What is the spatial and temporal scope of the scenario; what parts of the recovery phase are included; what is the starting situation at the point at which the exercise commences; what are the key events and timeline; at what points will “exercise injects” be provided?</p>
	<p>b) Map exercise timeline to real-time, consider use of “time jumps” to focus on the time steps of most relevance/interest TIP: The timelines of recovery are longer than those of the response phase and so exercise design can be more challenging in this respect. The use of “time jumps”, where the participants end one phase of the recovery and immediately move on some time to another phase of interest, is common but introduces additional complexity. To avoid confusion, “time jumps” should be clearly communicated to participants and the transition from one time step to another made obvious, for example by separating them with a natural break in play</p>
	<p>c) Consider how individual exercises may be linked (e.g. linked response phase and recovery phase exercises, played sequentially and both based on the same accident scenario)</p>

Step	Description
D) Develop data	<p>a) Identify the data necessary to test the exercise objectives. For recovery situations, the range of data that could be required is extensive and will include information not only on the radiological hazard (dose rate measurements, food contamination measurements etc.), but issues such as geography, demographics, meteorology, media and public responses and the resources available to be deployed</p>
	<p>b) Realism: there is a balance to be struck between realism and practicality; participants should ideally receive data in the form they would expect to receive it in a real event</p>
E) Management arrangements	<p>a) Consider how instructions, data and exercise injects will be provided; where possible, provision of data should simulate reality TIP: Bear in mind that information control is an important function that exercises can be used to test</p>
	<p>b) Give adequate consideration to exercise logistics</p>
F) Undertake exercise	
G) Perform evaluation and hold debrief	<p>a) Evaluate the performance in terms of recovery decisions, co-ordination, outcomes and other issues; where possible, evaluation of a given topic/objective should be carried out by someone with relevant expertise</p>
	<p>b) Evaluate the exercise and consider what can be done better or differently for future exercises; include the players’ experiences in identifying what went well and what could be improved</p>
H) Produce exercise report	<p>a) Record observations made during the exercise, including performance against the relevant objectives and any lessons learnt</p>
	<p>b) Set recommendations or follow-up actions to improve recovery framework and address any weaknesses or issues identified</p>
I) Share, refine and improve exercise design	<p>a) Share best practice and lessons learnt to feed back into future exercise design; where possible, also share these internationally</p>
	<p>b) Identify existing international best practice and feed into future exercise design</p>

Advice in NCRP 175

- “... start planning for long-term recovery at the earliest time after the incident has occurred” (page 154)
- How to most effectively exercise this?



US Recovery Exercise – Liberty RadEx (2010)

- Planning for 3 years, assessing human resource gaps for RDD long term response
- Many tactics to simulate reality
 - Extensive in-brief to set the scene months in to a mature response
 - Simulated politicals and community
- Lessons: Expertise shortage, data mgmt.
- Obstacles: Funding, time, scope limits



How to Plan an Effective Recovery Exercise

Liberty RadEx was prohibitively expensive

Recommend:

- development of smaller-scale, modular tabletop exercise on key recovery practices
- using response cost savings as motivation for involving top government leadership
- integrating private industry – how to motivate their participation?



NCRP 175 on Liberty RadEx

“... Although radioactive waste issues were included in the exercise, more in-depth effort needs to include estimating the magnitude of waste generated, feasibility of temporary waste staging areas, and developing practical infrastructure to accommodate the large amount of waste generated.” (page 217)

How to exercise this better?

What to Practice in a Recovery Exercise



Establish recommended organizations:

- Incident Command set up Cleanup Planning Unit
- Technical & Stakeholder Working Groups



Plan for discussing Recovery Objectives

Avoid prior pitfalls and prior exercise lessons



Practice messaging for decision maker and public

Simulate external pressures

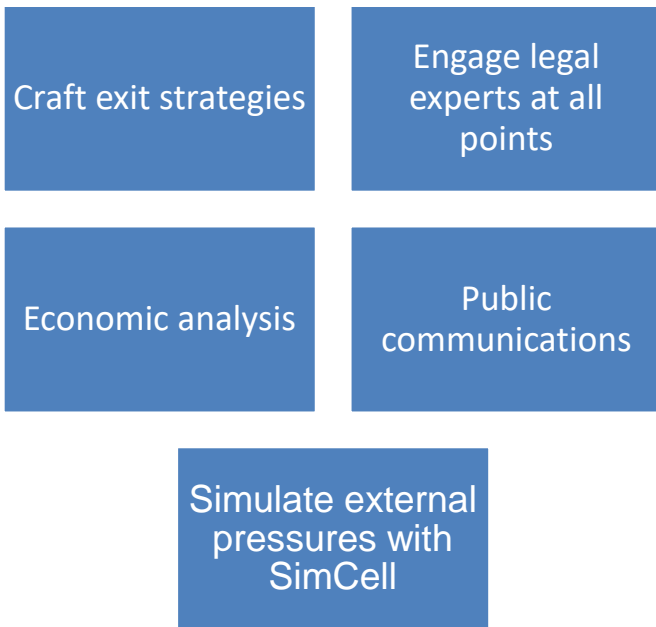


Study scenarios, estimate waste volumes and project costs for staging, processing and interim storage

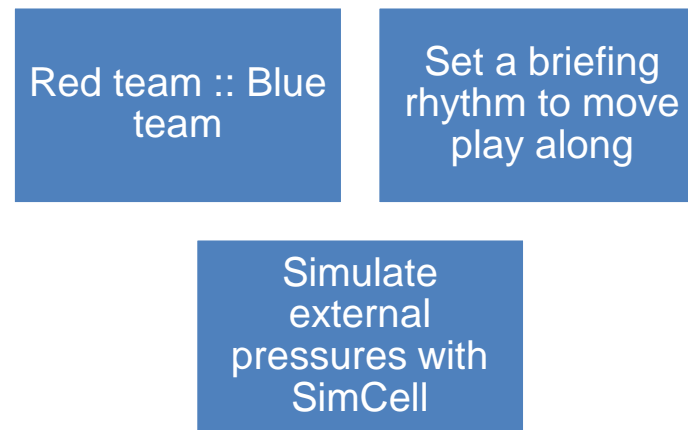


What and How: Recovery exercise

PRACTICE



EXECUTE



Cobalt Magnet (Consequence Management) '25

Anticipated
Spring
2025

5 Day Ingestion Pathway Exercise (Dept. of Energy (DOE) led) followed a month later by Long-term Recovery Workshop (Environmental Protection Agency (EPA) led)

International coordination and data harmonization

Canadian government at both the National and Provincial level (Ontario) are on the planning committee and will participate in exercise

State-level (Michigan) Lead Planner was invited to observe CM-22

*Some discussions about possibly linking CM-25 and INEX-6

Thank you for your attention



All NEA publications and institutional documentation available at
www.oecd-nea.org

