The IAEA Report on the Fukushima Daiichi Accident

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The IAEA plays the leading role in producing a technically comprehensive report based on the understanding of the facts and IAEA’s assessment of the accident.

- **Summary Report:**
  - Informative and easily understandable for decision makers and general public.

- **5 scientific/technical chapters:**
  - Includes in an understandable balanced manner, nuclear safety and radiological aspects focusing on scientific/technical data;
  - Provides a description of the accident, its causes and consequences and address relevant key issues;
  - Will be authoritative, factual and balanced with sufficient technical depth but easily understandable.
Approximately 180 experts from over 40 Member States and various international organizations (including IAEA staff) were involved in the preparation of 5 chapters.
Chapter 1 serves as the depository of the event’s key information to be referred to by other chapters of the report that are performing assessments and evaluations of different aspect of the accident;

- It will be possible to fully determine the root causes of the accident and its progress only when the fuel debris, the status of the reactor pressure vessels (RPVs) and the primary containment vessels (PCVs) can be inspected and analysed;

- Information and data available at this time are presented in detail.
Accident

Initial Event: Earthquake
Concurrent Event: Tsunami
Accident: SBQ/LHHS
Loss of Fission Barriers
Response:
  - Establish fundamental functions
  - Protect public/environment from release

Fundamental Functions Re-established

Quasi-State Stabilization

Stabilization & Remediation:
- Perform adequate fundamental functions
- Reductive measures for radiological releases and exposures
- Maintenance and Enhancement of Stability
- Reliable, redundant, uninterruptable safety functions
- Systematic reduction of radiological releases and exposures

Steady-state Stability

Decommissioning & Recovery:
- Removal of radioactive sources
- Removal of heat source
- Restoration of local communities

Safe condition

IAEA Report Freeze

Roadmap to Decommissioning as of March 2014

Dates

March 2011
May 2011
December 2011 (TEPCO "Cold Shutdown")
April 2012 (steady parameters)
TBD
December 2013
Unit 4 SF Removal begins
April 2014
December 2015*

(*) For example - Unit 4 (Spent Fuel) is removed.
Chapter 2 – Safety assessment

✓ Chapter 2 describes ‘why’ the accident happened the way it did. To do so, multiple assessments have been performed to answer the questions:
  – why did the site suffer from an extended station blackout?
  – why were site staff unable to cool the reactors and maintain containment function?

✓ Chapter 2 includes assessment, observations and lessons related to:
  – natural events and plant design;
  – natural events affecting multi-unit stations;
  – critical safety functions;
  – deterministic and probabilistic methodologies for safety assessment;
  – beyond design basis events;
  – accident management;
  – regulatory programmes;
  – human and organizational factors;
  – operating experience feedback.
Chapter 3 describes key events and response actions from the onset of the accident until 1 April 2012. It provides insights to the relevant parts of the national EPR system in place at the time of the accident and related response actions to allow for better understanding how they functioned in response to the accident;

Chapter 3 includes assessment, observations and lessons related to:
- initial actions in response to the accident;
- protecting emergency workers and helpers;
- protective actions and other response actions for the public;
- transitioning from the emergency and national analysis of the response;
- response within international EPR framework.

The Japan’s response to the accident highlighted lessons from the past emergencies and clearly demonstrated once again the importance of being adequately prepared for the response.
Chapter 4 describes the consequences of the accident at the Fukushima Daiichi NPP on people and the environment;

An important difference between this chapter and previous international reporting is that the assessments are based not only on relevant information available in the public scientific literature but also on quantitative information, including both personal and ambient monitoring data, which was formally submitted by the Government of Japan;

Chapter 4 includes assessment, observations and lessons related to:
- radioactivity in the environment;
- radiation exposure;
- radiological protection;
- health consequences;
- consequences for non-human organisms.
Chapter 5 – Post-accident recovery

✓ Chapter 5 deals with the recovery stage of the Fukushima Daiichi Nuclear Power Plant (NPP) accident. The chapter provides a description and analysis of the initial recovery actions, and also looks ahead based on the current plans for ongoing recovery activities;

✓ Chapter 5 presents:
  – what we know about the recovery from the Fukushima Daiichi NPP accident that we may not have known before;
  – which actions including protective or management actions were done well and effectively and where is room for improvement; and
  – which findings are specific for the Fukushima Daiichi NPP accident and what general findings can be extracted that are useful for the global community to enhance nuclear safety worldwide.

✓ Chapter 5 includes assessment, observations and lessons related to:
  – remediation of contaminated areas;
  – stabilization of the damaged reactors leading towards their eventual decommissioning;
  – effective and safe management of resulting contaminated material and radioactive waste leading to its ultimate disposal; and
  – re-establishment of infrastructure and the revitalization of community life.
There are many observations and lessons arising from an analysis of the accident, but few major new ones;

The main lesson to be learned is that lessons about nuclear safety which had already been identified need to be implemented;

All observations and lessons to be learned from the accident at the Fukushima Daiichi NPP will be gathered;

The report will include:

- New lessons that emerged from the Fukushima Daiichi accident;
- Observations, including issues known before this accident which have again been highlighted during and since the accident;

The key observations and lessons will additionally be highlighted in the Summary Report.
**Current status:**

- **March 2013:** Drafting
- **July 2014:** Review and revision
- **December 2014:** Final editing and dissemination

- External reviewers;
- Internal Assurance Group;
- Core Group;
- WGs;
- ITAG;
- Gov. of Japan (factual review).

**Formal publication of the report is planned for the 59th IAEA General Conference in September 2015.**