

# **Integrated NEA Response to the Fukushima Dai-ichi NPP Accident**

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- ❖ **NEA direct support to Japan**
- ❖ **NEA Integrated Response to the Fukushima Dai-ichi Accident**
- ❖ **Ongoing Activities in Response to Fukushima Daiichi within CSNI, CNRA and CRPPH**
- ❖ **Concluding Remarks**

- ❖ **Stress tests**
- ❖ **Safety authority**
- ❖ **Decontamination**
- ❖ **Research**

- CSNI, CNRA and CRPPH discussed appropriate strategies and priorities in response to Fukushima Daiichi beginning in late spring 2011
- December 2011 – Tri-bureau meeting of the CNRA, CRPPH, and CSNI to discuss coordination and integration of NEA response
  - ✓ Enhanced cooperation and coordination among involved committees for efficiency
  - ✓ Cross-Committee activities identified and prioritized
  - ✓ Strategic alignment on new work scope of NEA
  - ✓ Agreement on approach to coordinate cross-committee activities
  - ✓ Cross-committee process defined

- ❖ Integrated list of 3 Committees' ideas and proposals for new Fukushima-related work – shared with all 3 STCs
- ❖ CNRA STG-FUKU coordinates new cross-committee Fukushima related work
  - Supports information exchange between NEA Members and between Working Groups, Parties, and Task Groups of the 3 STCs
  - Coordinates activities between STC subgroups as needed
- ❖ CSNI PRG (expanded) reviews and makes recommendations on cross-committee Fukushima related work products
- ❖ Joint and Tri-Bureau Meetings



	CNRA	CRPPH	CSNI
<b>1. Accident Management and Progression</b>			
a. TRANSITION: Review of on-site accident management programmes and procedures to address the transitional conduct of operations from normal to accident conditions to severe accident conditions, and to the implementation of protective measures under the emergency preparedness plans. This includes onsite and offsite decision-making processes.	L	S	S
b. ACCIDENT PROGRESSION: Enhanced understanding of accident progression analyses methods and techniques.	S	S	L
c. HUMAN PERFORMANCE: Human and organisational performance issues under accident response conditions.	S	S	L
d. OFFSITE: Improvement of off-site emergency preparedness by sharing knowledge on core melt accident progression and source term quantification to improve off-site emergency procedures and technical tools.	S	L	S
<b>2. Crisis or Emergency Communications (primary information exchange between CNRA and CRPPH)</b>			
a. PUBLIC: Communication with the public, media and other stakeholders including Japanese organisations.	L	S	
b. REGULATORS: Communication with the regulators in other countries and with international organisations, such as the International Atomic Energy Agency (IAEA) and the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE).	L	L	
c. ONSITE OFFSITE: Crisis communications between onsite and offsite emergency response organisations.	L	L	
<b>3. Reassessment of Defence-in-Depth</b>	S		L
<b>4. Evaluating the methodologies for defining and assessing initiating internal and external events, including coupled, as well as methodologies defining the design basis criteria</b>	S		L
<b>5. Reassessment of Operating Experience and prior opportunities to identify or address conditions that could challenge nuclear safety.</b>			
a. OP E: Evaluation of operating experience for events that may be precursors to future events that could challenge the safety of nuclear power plants given the insights from Fukushima.	L		S
b. RESEARCH: Review and gap analysis of safety research relevant to the analysis of the accident.	S		L
<b>6. Balancing deterministic and probabilistic approaches to regulatory decision making</b>	L		S
<b>7. Regulatory Infrastructure</b>	L		
<b>8. Radiological Protection and Health Physics</b>		L	
<b>9. Decontamination and recovery (onsite and offsite)</b>		L	

## CSNI

### ❖ Working Group on Accident Management and Analysis (WGAMA)

- WGAMA F-CAPS (2012)1 – Position paper on filtered containment venting
- WGAMA F-CAPS (2012)2 - International benchmarking project on fast-running software tools used to model fission product releases during accidents at nuclear power plants
- *WGAMA is discussing a possible additional new task on hydrogen generation and mitigation*

### ❖ Working Group on Human and Organisational Factors (WGHOFF)

- WGHOFF F-CAPS (2012)1 – Human performance and intervention under extreme conditions

## CSNI Cont'd

### ❖ Working Group on Integrity of Components and Structures (WGIAGE)

- WGIAGE F-CAPS (2012)2 – Metallic component margins under high seismic loads (MECOS)

### ❖ Working Group on Risk Assessment (WGRISK)

- WGRISK F-CAPS (2012)1 – Workshop on PSA of natural external events including earthquakes

### ❖ Other ongoing work within CSNI includes:

- A discussion paper on Defence-in-Depth to identifying future technical topics (joint effort with CNRA)
- Re-constitution of DiDELSYS TG to investigate the issue of electrical system robustness in light of Fukushima

## Safety Research/Joint Projects

- ❖ Importance of future safety research has been highlighted in the CSNI Concept Paper, CNRA STG Recommendations to CNRA and other supporting strategy/policy documents
- ❖ New safety research will be identified using a phased approach within NEA:
  - Comprehensive review of past safety research - done
  - Gap analysis based on research issues from Fukushima – ongoing
  - CSNI review of research direction – ongoing
- ❖ Joint international research project being established: *Benchmark Study of the Accident at the Fukushima Daiichi NPS (BSAF Project)*

## CNRA

- ❖ **CNRA Senior Task Group on Impacts of Fukushima Daiichi Accident (STG-FUKU)**
  - Established to coordinate CNRA and ultimately cross-committee response to Fukushima Daiichi accident
  - Discuss regulatory issues (i.e., Defence-in-Depth)
- ❖ **Working Group on Operating Experience (WGOE)**
  - Task on pre-cursor events - evaluation of various initiators and situations for new lessons in light of the Fukushima Daiichi accident and improvements in implementing lessons learnt. WGRISK to cooperate in a risk analysis of precursor events exercise

## CNRA Cont'd

### ❖ New Task Group on Accident Management established

- Enhancements of on-site accident management procedures
- Decision-making and guiding principles in emergency situations
- Guidance for instrumentation, equipment and supplies for addressing long-term aspects of accident management
- Guidance when taking extreme measures for AM



## CNRA Cont'd

### ❖ Working Group on Public Communication (WGPC)

- Completed workshop on Crisis Communication (Madrid, May 2012)

### ❖ Safety of Research Reactors Task Group (SORRTG)

- Task on peer review workshop of country comprehensive safety assessments (stress tests) of high risk RR facilities.

## CRPPH

- ❖ **Established Expert Group on Radiological Protection Aspects of the Fukushima NPP Accident (EG-RPF)**
- ❖ **Working Party on Nuclear Emergency Matters (WPNEM)**
  - INEX 4 evaluation report and workshop planning
  - EGIREs report on optimization in emergency preparedness and response with special focus on reference levels
  - Update of report on Short-term Countermeasures in Case of a Nuclear or Radiological Emergency (2003)
  - Survey on emergency management lessons learned

## CRPPH Cont'd

### ❖ Information System on Occupational Exposure (ISOE) Expert Group on Severe Accident Management (EG-SAM)

- Lesson learned in management of occupational exposure in high radiation areas

### ❖ Other CRPPH Activities

- Support to Japanese government workshops on decontamination and recovery and other technical topics

	TASK ONGOING	ACTIVITY
<b>1. Accident Management and Progression</b>		
a. TRANSITION: Review of on-site accident management programmes and procedures to address the transitional conduct of operations from normal to accident conditions to severe accident conditions, and to the implementation of protective measures under the emergency preparedness plans. This includes onsite and offsite decision-making processes.	✓	- CNRA TG Accident Management - WGHOFF Task on HP and Intervention under Extreme Conditions
b. ACCIDENT PROGRESSION: Enhanced understanding of accident progression analyses methods and techniques.	✓	- OECD-NEA Fukushima SA Benchmark Project (BSAF) - WGAMA Task on Filtered Containment Venting
c. HUMAN PERFORMANCE: Human and organisational performance issues under accident response conditions.	✓	- WGHOFF Task on HP under Extreme Conditions
d. OFFSITE: Improvement of off-site emergency preparedness by sharing knowledge on core melt accident progression and source term quantification to improve off-site emergency procedures and technical tools.	✓	- CNRA TG Accident Management - WGAMA/CRPPH Task on Benchmarking of Fast Running FP Releases Tools - OECD-NEA Fukushima SA Benchmark Project (BSAF)
<b>2. Crisis or Emergency Communications (primary information exchange between CNRA and CRPPH)</b>		
a. PUBLIC: Communication with the public, media and other stakeholders.	✓	- CNRA WGPC Crisis Communication workshop 2012
b. REGULATORS: Communication with the regulators in other countries and with international organisations, such as the International Atomic Energy Agency (IAEA) and the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE).	✓	- CNRA WGPC Crisis Communication workshop 2012
c. ONSITE OFFSITE: Crisis communications between onsite and offsite emergency response organisations.	✓	- CNRA WGPC Crisis Communication workshop 2012
<b>3. Reassessment of Defence-in-Depth</b>	✓	- CNRA, CSNI DiD Policy Paper and Focused Discussions 2012-2013

	TASK ONGOING	ACTIVITY
4. Evaluating the methodologies for defining and assessing initiating internal and external events, including coupled, as well as methodologies defining the design basis criteria	✓	<ul style="list-style-type: none"> <li>- WGRISK Task on PSA for External Events including Earthquakes</li> <li>- WGIAGE Task on Metallic Component Margins under High Seismic Loads</li> </ul>
5. Reassessment of Operating Experience and prior opportunities to identify or address conditions that could challenge nuclear safety.		
a. OP E: Evaluation of operating experience for events that may be precursors to future events that could challenge the safety of nuclear power plants given the insights from Fukushima.	✓	- CNRA WGOE/CSNI WGRISK Task on Pre-cursor events and PSA studies
b. RESEARCH: Review and analysis of safety research relevant to the analysis of the accident.	✓	- Task on review and analysis of previous OECD-NEA joint international research projects
6. Balancing deterministic and probabilistic approaches to regulatory decision making		
7. Regulatory Infrastructure (non-cross committee that is planned and implemented following previously established processes)	✓	- NEA missions to Japan to support regulatory reviews
8. Radiological Protection and Health Physics (non-cross committee that is planned and implemented following previously established processes)	✓	<ul style="list-style-type: none"> <li>- EG-RPF assistance to ICRP reviews</li> <li>- WPNEM lessons learned reviews</li> <li>- EGIRES update report on optimization in EP</li> <li>- WPNEM update to short term countermeasures report (2003)</li> <li>- ISOE review by EG-SAM on occupational exposure in SA</li> </ul>
9. Decontamination and recovery (onsite and offsite) (non-cross committee that is planned and implemented following previously established processes)	✓	<ul style="list-style-type: none"> <li>- CRPPH ongoing task on commodities and food following nuclear accident</li> <li>- NEA missions to Japan to provide assistance in decontamination and recovery actions</li> </ul>

- ❖ Approaches for external hazards, defense-in-depth, and deterministic vs. probabilistic safety assessments, may evolve as a result of:
  - Better understanding of external hazards and their consequences
  - Broader application of defence-in-depth
  - A more balanced use of deterministic and probabilistic approaches
  
- ❖ Policies may evolve in radiological protection, emergency and post-accident management:
  - Societal impacts beyond radiation hazards
  - Enhancements to crisis (emergency) communications
  - Enhanced offsite capabilities to respond to severe accidents (and severe natural disasters)

- ❖ Continued emphasis on strong international coordination and cooperation to enhance safety
- ❖ Societal acceptance needs transparent and comprehensive information on risks recognizing:
  - Safety authorities have determined that existing nuclear power plants are safe to operate according to the very demanding standards in place today
  - Enhancements to further improve safety continue to be identified and implemented
  - Most countries with nuclear power programs re-affirmed their commitment

# Thank you for your attention

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