



Strengthening Research and Development Effectiveness

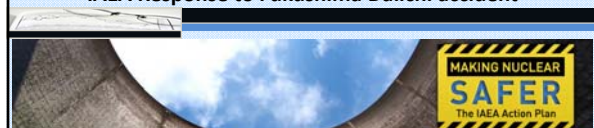
James E Lyons
Director, Division of Nuclear Installation Safety

Gustavo Caruso
Special Coordinator, Nuclear Safety Action Plan

Department of Nuclear Safety and Security



IAEA Response to Fukushima Daiichi accident




Nuclear Safety Action Plan


Defines a programme of work to strengthen the global nuclear safety framework. Covers all relevant aspects on nuclear safety, emergency preparedness and response, and radiation protection of people and environment

IAEA Fukushima Report:

Assessment of the accident that is authoritative, factual and balanced, addressing the causes and consequences as well as lessons learned.




IAEA Response to Fukushima Daiichi accident









Twelve key Actions

1. Safety Assessment
2. IAEA Peer Reviews
3. EPR
4. National Regulatory Bodies
5. Operating Organizations
6. IAEA Safety Standards
7. International Legal Framework
8. Member States Embarking on Nuclear Power
9. Capacity Building
10. Protection from Ionizing Radiation
11. Communication
12. Research & Development



NSAP: Communication and Dissemination of Information


IAEA
Fukushima
Report:
5 Working
groups

NSAP: Communication and Dissemination of Information

Action 11: Enhance transparency and effectiveness of communication and improve dissemination of information









Why International Expert Meetings'




- IAEA was mandated to organize international experts' meetings (IEMs) to analyse all relevant technical aspects and learn the lessons from the Fukushima Daiichi accident
- IAEA shares these lessons worldwide

NSAP: Communication and Dissemination of Information

International Experts' Meetings (IEM's)











International Experts' Meeting IEM-8




IAEA Headquarters
Vienna, Austria
16-20 Feb 2015
 in
Cooperation
 With
OECD/NEA

- **Strengthening Research and Development Effectiveness in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant**
 - Forum to exchange information and experience on R&D related to the safety of nuclear power plants (NPPs)
 - R&D activities in nuclear safety, technology and engineering for existing NPPs and in the design of new NPPs
 - Identifying and prioritizing the R&D areas in which possible international collaboration will be beneficial and/or necessary




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Topics of interest for:

- Nuclear regulators
- NPP operators
- Nuclear reactor vendors
- Research institutes
- Technical support organizations (TSOs)

- 1. Common cause failures of safety functions due to external/internal events**
- 2. Technologies to prevent/mitigate severe accidents**
- 3. Severe accident analysis and management**
- 4. Emergency preparedness and response**
- 5. Post accident recovery**




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1. Common cause failures of safety functions due to external and internal events

- **Strengthening R&D activities to protect NPPs against extreme external events in order to prevent severe accidents**
 - Measures to protect against earthquakes and tsunamis
 - Measures to protect against volcanic eruptions, tornadoes and other natural hazards
- **Enhance resistance to internal events**
 - Measures to protect against fires, internal flooding and other internal events




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2. Technologies to prevent/mitigate severe accidents

- Measures to prevent/mitigate core damages
- Measures to maintain containment/confinement integrity
- Measures to prevent hydrogen explosions
- Instrumentation for safety-related parameters and monitoring equipment under severe accident conditions
- Measures to suppress radioactive materials transport


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3. Severe accident analysis and management

- Development/improvement of analysis tools for severe accidents
- Considerations on accident management for multi-unit sites and multi sites
- Effective utilization of PSA methodologies for risk assessment and management
- Deterministic and probabilistic analysis of spent fuel pools
- Research related to source term calculation and release of radioactive material


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4. Emergency preparedness and response

- On-site emergency response facilities, equipment and procedures
- Reliable off-site and on-site power supplies
- Off-site infrastructure resilience
- Research related to water and food contamination, and atmospheric dispersion


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5. Post accident recovery

- On-site post-accident stabilization activities
- On-site waste management
- Off-site remediation and waste management
- Fuel and fuel debris removal (characterization, dose reductions, remote technologies)
- Decommissioning after an accident

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SAVE THE DATE!

IAEA Headquarters
Vienna, Austria
16-20 February 2015

- Announcement and Call for Papers to be issued soon
- Extended synopses – October 2014
- Acceptance of papers – November 2014

IAEA Coordinated Research Projects (CRP)




Severely Damaged Spent Fuel

- Management of severely damaged spent fuel and corium
 - CS held 2-4 September 2013
- Development of a CRP Proposal
 - To expand the existing knowledge base and identify optimal approaches for managing severely damaged spent fuel
 - <http://cra.iaea.org/cra/index.html> code T13015 new

IAEA Coordinated Research Projects (CRP)

Fuel Modelling in Accident Conditions


- CRP on Fuel Modelling in Accident Conditions (FUMAC, 2014-2017)
 - Analysis and understanding of fuel behaviour in accident conditions
 - Identification of best practices in the application of relevant physical models and computer codes
 - Enhancement of fuel modelling and predictive capabilities in Member States
 - Selected experimental results will be integrated into the joint NEA-IAEA International Fuel Performance Experimental (IFPE) database, and used for codes verification and comparisons.

 IAEA
International Atomic Energy Agency

IAEA Coordinated Research Projects (CRP)

Accident Tolerant Fuels

- CRP on Analysis of Options and Experimental Examination of Accident Tolerant Fuels for Water-Cooled Reactors (ACTOF, 2015-2018)
 - Examine approaches for development of water-cooled reactor fuel with improved tolerance to the severe accident conditions;
 - Reduced hydrogen production in accident scenarios;
 - Technological, operational and economic aspects of accident tolerant fuel manufacturing and implementation


 IAEA
International Atomic Energy Agency

IAEA Coordinated Research Projects (CRP)

Material properties database for aging Research Reactors

More than 50% of operating research reactors are over 45 years old


- CRP to establish a database for irradiated core structural components
 - continued safe operation
 - lifetime extension
- Expected to provide valuable information for improving design provisions and operational practices for effective ageing management
- Participation of senior experts from organizations of 11+ Member States
- First research coordination meeting November 2013 in Vienna
 - individual work plans were developed and integrated
- CRP results will be published

 IAEA
International Atomic Energy Agency

Cooperation with EU/EC for R&D Programme

Periodical Coordination for
- TMs/ WSS
- Joint publications

- Plant Life Management for Long Term Operation
 - Coordination EU R&D programme " Nuclear Generation II & III Association (NUGENIA)"
- Sustainable Energy Planning
 - Methodology for developing countries versus specific climate/energy targets and roadmaps for the EU 2050
- Nuclear Knowledge Management and Ageing Management programmes for Research Reactors
 - Collaboration in NKM/ Research Reactors
- Waste Management/Decommissioning
 - Successful cooperation and EC is co-financing the Interregional Mediterranean project



Working to protect people, society and the environment



Thank you



g.caruso@iaea.org
