The NEA and the Role of International Global Harmonisation in Enhancing the Practical Application of Defence in Depth

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Presentation Outline

- NEA Activities to Enhance Global Nuclear Safety
- The NEA Report
  on the Fukushima Daiichi Nuclear Power Plant Accident
- The NEA One-Day Workshop on DiD
- Further Work to be learnt
  on International Harmonisation of Defence in Depth
- Conclusions

Long-Established NEA Activities to Enhance Global Nuclear Safety

- 3 Standing Committees with safety mandates
  - CNRA (Committee on Nuclear Regulatory Activities)
  - CSNI (Committee on the Safety of Nuclear Installations)
  - CRPPH (Committee on Radiation protection and Public health)
- Also a Large Portfolio of Joint Research Projects in Nuclear Safety
- Existed prior to Fukushima Daiichi Accident
- Mature responsive infrastructure between 31 countries
- Able to respond in a measured way to the crisis

NEA Activities to Enhance Global Nuclear Safety : post-Fukushima [1/2]

Initially these included:

CNRA

- The exchange of information between member countries.
- Creating a Senior Task Group on Fukushima (STG-FUKU)
- Initiating Fukushima-related activities within the existing CNRA working groups
- Requested CSNI to take part in the following:
  - ✓ Reassessment of **DiD considerations.**
  - ✓ Reassessment of accident management issues.
  - ✓ A review of pre-cursor events.

CSNI

- Supporting CNRA in delivering the three tasks requested

Additionally proposing a further task and exploring further work NEA should progress:

- Task on the development of a thorough understanding of the Fukushima accident progression;
- Concept paper identifying possible NEA activities including **research underpinning defence in depth and the understanding of nuclear plant safety**

CRPPH

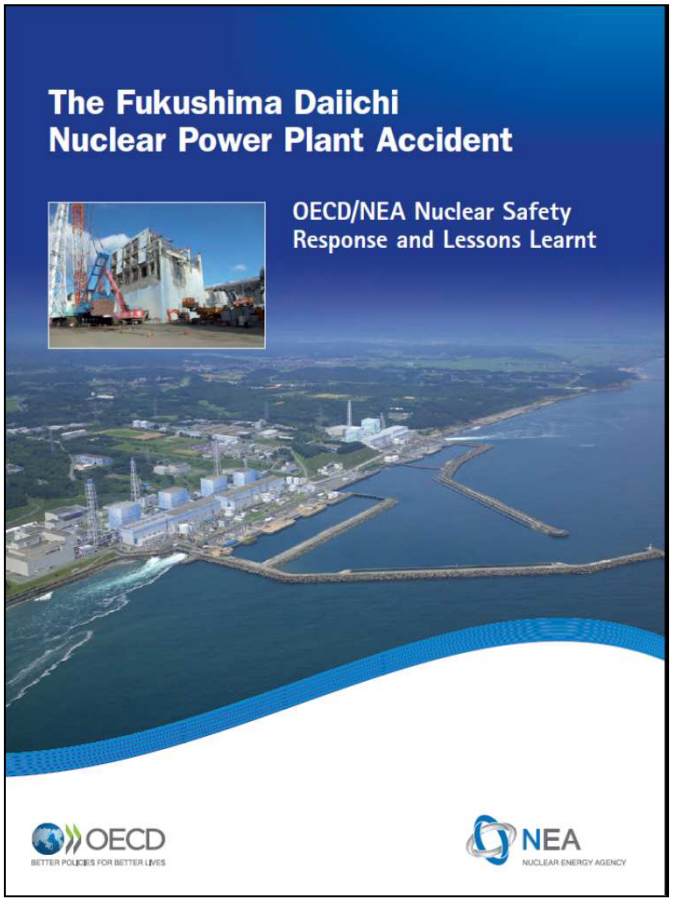
- Ensuring learning from the experience and improvement for the future.
- Making CRPP expertise available to Japanese and stakeholders.
- Shared and assessed national lessons learnt and how countries reacte.
- Assisted Japanese by involving key stakeholders in consequence management.
- Co-sponsored and participated in many meetings that aimed to make available the international experience inherent in CRPPH in improving the post-accident environment.

NEA Activities to Enhance Global Nuclear Safety : post-Fukushima [2/2]

- A tri-committee coordination process was used to assist in the development and assignment of activities.
- Joint Research Project BSAF (Benchmark Study of the Accident at the Fukushima-Daiichi Nuclear Power Station) in conjunction with the Japanese authorities.
- Transition of Fukushima related activities into the long-term strategic plans of the NEA and routine Standing Technical Committee processes.
- (F-CAPS) Fukushima – Committee Activity Proposal Sheet – scope and detail an activity and ensures that they can continued to be tracked for progress.

NEA Report

The Fukushima Daiichi Nuclear Power Plant Accident
OECD/NEA Nuclear Safety Response and Lessons Learnt



http://home.nea.fr/pub/2013/7161-fukushima2013.pdf

Key and Significant Messages of Report related to Defence-in-Depth [1/3]

- Both before and after the accident the concept of DiD is considered to be an important part of the foundations of nuclear safety principles.
- The fundamental concepts of DiD remain valid and continue to be shared by those in charge of nuclear safety (operators, safety bodies).
- A high level of alignment of the concepts underpinning DiD currently exists.
- Even though the concepts are shared, implementation in different regulatory frameworks is divergent.

Key and Significant Messages of Report related to Defence-in-Depth [2/3]

- Regulatory authorities should consider including within their guidance:
  - Ensuring that there is the right balance between prevention and mitigation measures at each level of DiD,
  - that DiD is expected to be applied to both the design phase and siting of the NPP – providing assurance that the risks from external hazards are fully considered before the plants are designed and constructed, and unique site features are taken advantage of to minimise common-cause failures of equipment.
  - that independence of the application of DiD between levels is strived for in order to minimise the potential for common-cause failures

Key and Significant Messages of Report related to Defence-in-Depth [3/3]

- It is clear then that implementation of DiD would benefit from improved knowledge of and methods for determining the risks from potential external hazards.
- In the absence of improved knowledge and methods, and where there is higher uncertainty, as in the case of external hazards, effective implementation of the DiD concept requires additional measures to address these uncertainties and the unknown in order to maintain adequate safety margins.

Key Conclusions of Report related to Defence-in-Depth [1/3]

- To date, safety reassessments carried out at nuclear power plants around the world have concluded that facilities examined offer a safety level that is sufficient, and no immediate shutdown has been required.
- Nevertheless, continued operation of nuclear power plants requires that their robustness to extreme situations be increased beyond the existing safety margins, as soon as possible. It is crucial to continue these reassessments on a periodic basis and to ensure that all safety improvements identified are fully implemented in a timely manner.

Key Conclusions of Report related to Defence-in-Depth [2/3]

- Nuclear power plant operators and nuclear activity licensees have prime responsibility for the safety of their activity.
- Nuclear regulatory authorities play a fundamental role in ensuring such compliance so that workers, the general public and the environment are protected.
- To date, a considerable amount of work has been completed related to the outcomes of the Fukushima Daiichi accident, but much more remains to be done.
- To perform this work, a consistent international effort is necessary not only by the licensees but also by national regulators, technical support organisations and international networks and organisations.

Key Conclusions of Report related to Defence-in-Depth [3/3]

- Care must be taken to ensure that all international initiatives remain consistent and avoid any duplication of work.
- It is the collective responsibility of the nuclear community to ensure that there is no complacency in the effective implementation of the practices and approaches that have been developed over decades of use of nuclear power to protect the public and the environment from the harmful effects of radiation.
- A questioning and learning attitude is essential to continue improving the high level of safety standards and their effective implementation.

Workshop on Challenges and Enhancements to DiD in light of the Fukushima Dai-ichi Accident

- One-day workshop jointly organised by the CNRA and the CSNI and held on 5 June 2013.
- Participation
  - All NEA member countries were invited to participate.
  - Senior regulators, senior industry representatives, international organisations
- Used the specific messages and general conclusions that were developing during the construction of the NEA Fukushima report to underpin the organisation of, and feed into its work.

Workshop Sessions

- Session 1: Setting the Scene and overviewing DiD
- Session 2: Concepts of DiD in detail
- Session 3: Implementation of DiD – Focus on External Events
- Session 4: Closing Discussions

Further Work for NEA and its Members

- The closing discussions highlighted future areas the NEA members considered NEA as a whole should be working in to enhance the understanding and implementation of Defence in Depth
- CNRA will discuss in December 2013 the conclusions from the DiD workshop and decide on future NEA tasks

Further work to be considered by CNRA on Defence in Depth [1/2]

- Exploring what the DiD safety goal concept ”practically eliminate large and early offsite releases” means and how is it implemented.
- The importance of a strong safety culture and questioning attitude within both the operating and regulatory organizations.
- The need to establish regulatory boundaries for consideration of external hazards within the context of the design bases and the implementation of DiD.

Further work to be considered by CNRA on Defence in Depth [2/2]

- Need to revisit and improve long-term emergency preparedness with realism in emergency planning to improve efficient response and recovery.
- New approaches for safety management of external hazards individually and in combination.
- taking account of catastrophic external events effects on emergency response and recovery when considering human interventions.
- Detailed identification of additional safety research after Fukushima.

Conclusions

- The NEA has brought much of its collective knowledge and experience into play following the Fukushima Accident.
- It has identified that to date, safety reassessments carried out at nuclear power plants around the world have concluded that facilities examined offer a safety level that is sufficient, and no immediate shutdown has been required.
- However it has further identified work that should be carried out both nationally and internationally that will do much to improve the implementation of Defence-in-Depth within Nuclear Safety.
- It is now putting together programmes of activities to assist in the development of those improvements and in delivering appropriate international harmonisation through the body of its membership.
- Continue to support Japanese institutions on specific safety topics, as requested.

http://www.oecd-nea.org/

Thank you for your attention