

International Conference on Topical Issues in Nuclear Installation Safety

21 – 24 October 2013

**Defence in Depth: Advances and Challenges for
Nuclear Installation Safety**

Topical Session 1 Report



IAEA

International Atomic Energy Agency

Topical Session Number 1

List of Presentations

1. Japan, H. Yamagata, *The Defence in Depth Concept Applied to the New Regulatory Requirements in Japan*

2. Belgium, G.L. Fiorini, et al. *The Design Options and Provision File and the Role of Defence in Depth within the Prelicensing of the MYRRHA Project*

3. China, Y. Wang, et al. *Reinforcement of Defence in Depth: Modification Practice after the Fukushima Nuclear Accident*

4. IAEA, B. Poulat *Successive Evolutions of the Defence in Depth Concept*

5. EC, G.L. Fiorini, et al. *The ISAM Tool “Objective Provision Tree (OPT)”, for the Identification of the Design Basis and the Construction of the Safety Architecture*

6. France, C. Lavarenne, et al. *How to Reinforce the Defence in Depth by Taking into Account Natural Hazards?*

7. Russian Federation, Yu. V. Shvyryaev, et al. *Application of the Defense-in-Depth Concept in the Projects of New-Generation NPPs Equipped with VVER Reactors*



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- **Conclusions and Recommendations**
 - **Importance of Defence in Depth**
 - The concept is and should remain the basic strategy for both existing and new reactors
 - Robustness of DID as a concept should be further enhanced
 - **Consideration to be given to development of more specific IAEA guidance documents on**
 - Comprehensiveness of DID provisions
 - Way of addressing in SAR the adequacy of implementation of DID for each level by means as appropriate using deterministic and probabilistic approaches

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- Conclusions and Recommendations
 - **Areas to be considered for international harmonization of objectives and approaches**
 - Definition of design basis hazards and design extension hazards
 - Consistency of large release frequency $10^{-6}/y$ for new reactors with the requirement on practical elimination of large releases
 - Ways of implementation of DID for innovative reactors.
 - Understanding the different levels of defence established in IAEA SSR-2/1 and WENRA guidance documents and the implications
 - **Strengthening of IAEA services relevant for DID**
 - Promoting wider use of the siting and design safety review service
 - Include in the OSART a module on processes for design re-evaluation of the NPP



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- Conclusions and Recommendations
 - **Clarification of specific issues in connection with strengthening DID**
 - Practical elimination of fault sequence leading to large releases
 - Independence of individual levels of DID and its benefits for safety - avoiding conditional failure between levels
 - Demonstration of adequate reliability of individual levels of DID – deterministic and probabilistic approaches