

5th MDEP Conference on new reactor design activities

International Co-operation: Past, Present and Future

24-25 April 2023 | Antalya, Türkiye



APR-1400 WG — KEY ACHIEVEMENTS AND LESSONS LEARNT (2012-2021)

Guenael Le Cann (FANR) —
APR1400WG Chair

APR-1400WG MEMBERS (WG FORMED IN 2012; CLOSURE IN 2021)



- **Republic of Korea (KINS)**

- Construction of Six APR1400 units since 2008;
- As of 2023, three units in operation and three in construction

- **United Arab Emirates (FANR)**

- Construction of four APR1400 units since 2012
- First unit in operation since 2020; As of 2023, three units in operation

- **Finland (STUK)**

- Early withdrawal from APR-1400WG

- **United States of America (NRC)**

- APR1400 Design Certification (DC) Application received in 2014 and approved in 2019
- Inactive member since 2019 following the completion of DC review

APR-1400WG: ACCOMPLISHMENTS OF DESIGN WORKING GROUP (DWG) ASSOCIATED WITH TECHNICAL EXPERT SUBGROUPS (TESG)



Accidents and Transients TESG

- Issuance of Common Position papers addressing relevant issues arising from the regulatory review during CL and OL application (or DC review) stages
- e.g., Post-LOCA strainer performance and debris in-vessel downstream effects; Fuel Thermal Conductivity Degradation; Irradiation effect on APR1400 fuel bundle spacer grid strength

Severe Accidents TESG

- Issuance of technical reports on post-Fukushima design enhancements and MCCI phenomenon specific to APR1400; as well as comparison of regulatory requirements for PRA and severe accidents

APR-1400WG KEY HIGHLIGHTS AND BENEFITS



- Work conducted by WG provided a common approach to achieve a balanced and harmonized APR-1400 design review for certain items of interest amongst members
- In areas where governing regulatory requirements differ from member to member, WG engagement allowed a better understanding of each member country's regulatory decision & basis and aided in the regulatory review of certain issues (e.g., severe accidents)
- Repository of information and reports generated from the WG could aid other countries regulatory review interested in pursuing the APR-1400 technology

APR-1400WG CHALLENGES OBSERVED



- Changes to group composition and members affecting work continuity and effectiveness (e.g., consolidation of comments on reports, endorsements on final reports, additional learning curve for new member, etc.)
- Sensitivity of information limiting the scope of work and contents due to export controlled and commercial / proprietary nature
- Different licensing stages amongst members affecting resources and priorities in each respective country; required alignment on group activities such that all members can benefit in a meaningful way

APR-1400WG LESSONS LEARNED AND MOVING FORWARD



- Recognizing and understanding each member country's regulatory requirements and review practices proved to be useful for WG activities; allowed the group to focus on issues relevant to all members
- TESGs within the group allowed members to stay focused on specific safety significant issues and facilitated many fruitful discussions; which in some instances, resulted in a resolution of issues in a member country
- Technical discussions on current issues and operational experiences especially helpful for member countries who were at different stages of licensing reviews
- Regulatory co-operation and information exchange amongst members through MDEP proved to be useful; APR1400 WG activities can serve as a foundation to expand upon should a need arise for a future WG



THANK YOU