November 3, 2010

ATTACHED ARE THE SLIDES FROM THE "NGNP WHITE PAPER COMPARISON TO DRAFT 53.1" PRESENTATION, WHICH WAS GIVEN AT THE NOVEMBER 2, 2010 PUBLIC MEETING WITH INL/DOE REGARDING NGNP WHITE PAPERS

THESE SLIDES WERE PROVIDED ON THE DATE OF THIS COVER SHEET, AFTER THE MEETING WAS HELD.

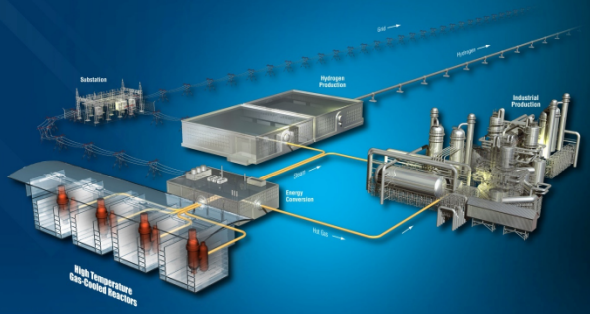
NGNP White Paper Comparison to Draft ANS 53.1 "Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants"

Presentation to NRC Staff by
Next Generation Nuclear Plant Project

November 2010

www.inl.gov

Idaho National Laboratory



Overview

- ANS 53.1 Purpose
- NGNP Project White Paper Purpose
- Status
- Conclusion

ANS 53.1 Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants

PURPOSE: Defines the process for specifying criteria to assure that modular helium-cooled reactor (MHR) plants are designed so that they can be constructed and operated safely without undue risk to public health and safety. This purpose is achieved through the identification of applicable safety requirements from the national nuclear regulator, industrial codes and standards, and other published guidance and professional engineering practices.

SCOPE: Provides a process for establishing top-level safety criteria, safety functions, top-level design criteria, licensing basis events, design basis accidents, safety classification of systems, structures, and components, safety analyses, defense-in-depth, and special treatment requirements.

3

NGNP White Paper Purpose

- **To begin the pre-application discussion with the NRC on key NGNP Licensing issues identified in the NGNP Licensing Plan**
- **Licensing white paper activities were prioritized based on available project resources to address issues that**:
  - Could potentially have significant impact on the plant design and/or long duration research & development activities
  - Will potentially require Commission action, based on the potential results from NRC Staff review of high priority NGNP licensing white papers
  - May represent a potentially significant license application content issue that could impact the application's acceptability or NRC review schedule
- **Licensing white paper activities were prioritized based on available project resources to address issues that**:
  - ANS 53.1 – Design Standard
  - NGNP WPs – pre-application *discussions with the NRC on key NGNP Licensing issues*

4

Status ANS 53.1 Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants

STATUS: Draft - Working Group has completed majority of comment incorporation

- Expected to be issued for re-Ballot November 2010.

Working Group:

- Lead: Jim August
- Members:
  - HTGR Vendors
  - NRC staff members
  - DOE
  - Nuclear Industry

5

Status of NGNP White Papers (related to ANS 53.1 topics)

- White papers submitted in FY-2010
  - INL/EXT-09-17139 NGNP Defense in Depth Approach (ML093480191)
  - INL/EXT-10-17686 NGNP Fuel Qualification Process (ML102040261)
  - INL/EXT-10-17997 Mechanistic Source Terms (ML102040261)
  - INL/EXT-10-19521 NGNP Licensing Basis Event Selection (ML102630246)
  - INL/EXT-10-19509 NGNP Structures, Systems, and Components Safety Classification (ML102660144)
- White papers planned for submittal in FY-2011
  - NGNP Safety Case
  - NGNP Probabilistic Risk Assessment

6

Conclusions

- Major topics of ANS 53.1 are covered by current/near term whitepapers or other planned submittals
- NGNP WPs are generally consistent with processes described in ANS 53.1, in light of implementing specific NRC and U.S. Regulations and Stakeholder requirements.
  - NGNP WPs include a Design Goal of meeting PAG at EAB which is not addressed in ANS 53.1
  - WPs emphasize the use of deterministic approaches (Engineering Judgment) to augment gaps or uncertainties in knowledge base or SSC performance

Conclusions (results)

- Level of detail not necessarily the same between ANS Standard and WPs
  - ANS 53.1 Sections 6.1, 6.5 & 6.6 general approaches to addressing Deterministic Analysis and Uncertainties
  - ANS 53.1 Section 8.0 requirements related to Special Treatment