TRIP REPORT

ACRS VISIT TO B&W GENERATION mPOWER INTEGRAL SYSTEM TEST (IST) FACILITY AT LYNCHBURG, VA

MAITRI BANERJEE, SENIOR STAFF ENGINEER, ACRS

Ten ACRS members[1] and six ACRS staff[2] visited the B&W office and the subject test facility during April 23-24, 2012. The purpose of the visit was for the ACRS members to familiarize themselves with the mPower modular reactor design and test program being developed to confirm that design will meet the NRC regulations and operate in a safe manner. The mPower IST loop is located at the State of Virginia's Center for Advanced Engineering and Research (CAER) Center at Lynchburg, constructed with support from the tobacco industry. On the first day, the B&W staff briefed the ACRS regarding the mPower modular reactor design, safety analysis, and testing program. The presentation slides are contained in ADAMS (Accession numbers ML12125A175 and ML12125A178). The ACRS members also visited [ ] in development at the B&W office. On the second day, the ACRS toured the IST facility.

B&W is engaged in pre-application interactions with the NRC staff prior to submittal of their design certification (DC) application scheduled for December 2013. Periodic meetings are being held to familiarize the staff with design developments and seek input and comments regarding the information needed by the staff to complete their review. B&W is using PRA information in their mPower reactor design development. The initial quantification of the internal events PRA [ ]. The NRC is planning an audit of the PRA program in July 2012. B&W reported that approximately [ ] were working on the mPower project.

[

Footnote:

1 Dennis Bley, Sam Armijo, Said Abdel-Khalik, Joy Rempe, Charlie Brown, Dick Skillman, Steve Schultz, John Stetkar, Mike Ryan, Bill Shack

2 Ed Hackett, John Lai, Girija Shukla, Maitri Banerjee, Antonio Dias, John Flack

.]

The members asked many questions regarding the mPower modular reactor design; design, operational and licensing review considerations of the unique features; scope, status and use of PRA in design development; control room design development; safety analyses and component and IST test program. The types of questions and areas probed by the ACRS members are listed in the attached document.

Attachment

Areas of Questions and Comments by the ACRS Members

1. Definition of “passive”
2. [ ] SBO capability
3. Schedule of IST tests, and [ ]
4. Given the very small expected CDF values, [ ]
5. Loss of FW and ATWS – extent of over-pressurization
6. Consideration of PTS given the design
7. Qualification of electrical components given major primary components are inside RPV
8. Design considerations and benefits of [ ]
9. Reactivity considerations and shutdown margin during the operating cycle given no chemical shim
10. Construction considerations given the modular design consisting of two units
11. Aspects of operational control of the reactor using control rods and FW
12. Operational control of the [ ] RCPs and comparison with current LWRs
13. Details of refueling operation, and consideration of operating status of the other unit
14. Component location and unique design features including SG, [ ], pressurizer, CRDM, [ ]; and challenges of design, material selection and ISI
15. Code applicability of unique design features and application
16. If PRA would include SAMDA, GSI-191, seismic risk quantification
17. Use of HRA in control room design
18. Accident analyses considerations of the unique design features and use of PIRT
19. Impact to ECCS design given the [ ]
20. Control room staffing given various challenges and monitoring of severe accident conditions
21. Material and welds for RPV, SG and high fluence environment
22. Loss of DC power and flooding and post Fukushima review of design