

From: James Lyons *NRL*
To: NRR_NRLPO
Date: 10/18/02 4:40PM
Subject: ACTION:Information for Comm. Merrifield

We have recieved a request from Comm. Merrifield's office for a status of our activities. The Commissioner is moderating a panel discussion on advanced reactors at the Nuclear Safety Research Conference on 10/28. I've updated the status sheet we've been using. Take a look at it to see if anything else needs to be added. We need to provide this by COB Monday. When we send it up to the EDO, I also want to attach the gantt chart schedule that Amy and Joe developed.

Jim

Q/35

Status of New Reactor Licensing Activities

10/18/2002

Design Certification Reviews

AP1000

Westinghouse applied for design certification of the AP1000 design on March 28, 2002, after completing a pre-application review phase that lasted approximately 18 months. The Westinghouse AP1000 passive advanced light-water reactor design is based on the AP600 design, which was certified in December 1999. The AP1000 is a larger version of the AP600 and is an approximately 1100 megawatt electric pressurized water reactor plant design in which passive safety systems are used for the ultimate safety protection of the plant. (The "1000" designation is the projected cost (\$/kW) of the nth operating plant.) The pre-application review focused on four topics chosen by Westinghouse: (1) the applicability of the AP600 testing program to the AP1000 design, (2) the applicability of the AP600 analysis codes to the AP1000 design, (3) the expected acceptability of requesting three exemptions that were granted for the AP600, and (4) the acceptability of using the design acceptance criteria (DAC) approach (in lieu of providing detailed design information) in the instrumentation and controls, human factors engineering, and piping design areas. The staff completed its pre-application review as documented in its letter to Westinghouse, dated March 25, 2002, on the first three issues and in a Commission Paper, dated April 1, 2002, on the DAC issue. The staff found that, in general, the AP600 testing program and analysis codes are applicable to the AP1000 design (some non-trivial exceptions were noted and will need to be resolved prior to design certification), the three exemptions are expected to be justifiable, and the proposed use of the DAC approach is acceptable. Based on the similarities in designs of the AP600 and AP1000, Westinghouse and the NRC staff expect efficiencies to be gained during the design certification review (as compared to a generic design certification review). The staff expects to complete the final design approval in October 2004 and the associated rulemaking in December 2005. As of October 1, 2002, the staff has completed its acceptance review and issued the requests for additional information (700 total) in accordance with the schedule.

ESBWR

The General Electric (GE) ESBWR is a 1380 MWe reactor, using natural circulation for normal operation, with passive safety features. This design is based on the certified Advanced BWR (ABWR) and the Simplified BWR (SBWR) designs. A public meeting was held on June 20 and 21, 2002 to begin the pre-application review for the ESBWR design. The scope of the pre-application review will include an assessment of the technology basis for passive safety systems and the analysis methodology for transients and accidents. The staff plans to complete the pre-application review in the fall of 2003 and expects GE to submit an application for design certification in early 2004.

ACR-700

The Advanced CANDU Reactor (ACR-700) is a 731 MWe light-water-cooled reactor with two steam generators and four heat transport pumps. Similar to previous CANDU designs, the ACR-700 utilizes a heavy water moderator. However, this is the first reactor design in the CANDU series to have a negative void reactivity coefficient. The ACR-700 also uses slightly enriched uranium fuel, light water coolant, a separate heavy water moderator, computer-controlled operation and on-power refueling. A public meeting with Atomic Energy of Canada Limited (AECL) was held on July 24, 2002, to discuss the ACR-700 design and the proposed pre-application review. A public meeting was held on September 25 - 26, 2002, which included a series of technical presentations by AECL. At this meeting, AECL provided a

proposed review plan which is currently being evaluated by the staff. In addition the staff is working on developing an approach regarding the appropriate level of coordination between the NRC, the Canadian Nuclear Safety Commission (CNSC), and the Nuclear Installations Inspectorate (NII) as the three regulatory agencies will be performing a simultaneous licensing of the design.

SWR-1000

The SWR-1000 is a Framatome ANP 1000 MWe boiling water reactor that uses passive safety features. The design is based on a Siemens concept (now Framatome ANP). The request for an SWR-1000 pre-application review was received on May 31, 2002. Framatome intends to submit materials for a pre-application review in mid-2004 and to submit an application for design certification by the end of 2005. Prior to the submittal of the pre-application material, Framatome expects to hold several meetings with the staff to identify and clarify issues related to the certification process and on matters of particular importance to the SWR-1000 design. For example, in an August 15, 2002, meeting, Framatome ANP will discussed the adequacy of the research and testing already completed and currently planned to support the SWR-1000. The staff plans to visit principal test facilities in FY 2003 that were used and will be used to conduct testing to support the application. The facilities are mainly in Germany.

GT-MHR

The Gas Turbine-Modular Helium Reactor (GT-MHR) design is a 300-MWe helium reactor design based on the high temperature gas-cooled reactor (HTGR) technology. The GT-MHR design uses helium as the coolant and employs refractory fuel. The ceramic-coated particles in the GT-MHR design are contained in fuel compacts that are inserted in graphite fuel elements. The current design allows for up to four 300 MWe modules per common control room. The design is currently being jointly developed by the U.S. and the Russian Federation (under DOE sponsorship) for disposition of weapons grade plutonium. It is expected that the pre-application phase will start soon, and it is estimated that it will take approximately 22 months from the initial exploratory discussion on the GT-MHR design between the NRC and General Atomics.

IRIS

The International Reactor Innovative and Secure (IRIS) is a 100-335 MWe integral light water reactor with all reactor coolant piping and heat transport systems located inside the reactor vessel. The IRIS design emphasizes proliferation resistance and enhanced safety. The request for IRIS pre-application review was received on July 11, 2002, and Westinghouse had an initial meeting with the NRC in October to cover the IRIS design as well as the proposed scope of the pre-application review. The current Westinghouse schedule calls for the preliminary design to be completed at the end of 2002 and the design certification application to be submitted in 2007.

PBMR

The Pebble Bed Modular Reactor (PBMR) is a modular HTGR that uses helium as its coolant. In December 2000, Exelon requested a pre-application review of the PBMR design. During 2001 and early 2002, the staff conducted a series of public meetings with Exelon to discuss topics related to the pre-application review. Topics of discussion included legal and financial issues, Exelon's proposed risk-informed licensing approach, and issues related to the PBMR design, such as containment vs. confinement, source term, fuel quality, and high temperature materials. In April 2002, Exelon decided not to continue with the pre-application review of its PBMR design. The South African company PBMR Pty., which is developing the PBMR design, has recently expressed interest in restarting pre-application activities with the NRC. In August

and October, PBMR Pty. discussed its future plans for a certification review of the PBMR with NRC management. PBMR Pty. indicated that they plan to request a pre-application review of the design to begin as early as 2004, and submit a design certification application in 2006. PBMR Pty. also discussed several major design differences that have evolved, including an eight-module configuration instead of 10, an increase in power to 165 MWe per module, 10 years storage of spent fuel in the plant (with additional storage capability in onsite concrete silos), and a fixed central reflector column. PBMR Pty. expects to start the construction of the South African demonstration unit in November 2005 and to complete construction in October 2007.

Early Site Permits

Three utilities have indicated they will apply for early site permits in 2003.

<u>Utility</u>	<u>Site</u>	<u>Date</u>
Exelon Clinton		June 2003
Entergy	Grand Gulf	June 2003
Dominion	North Anna	September 2003

The staff is meeting monthly with the three prospective applicants and NEI to address generic issues related to the early site permit applications and reviews. The prospective applicants have informed the staff of the activities they are undertaking at the sites. The staff will observe some of these activities to ensure that the data that the licensee is obtaining will meet the staff's needs when submitted. In addition, the staff will hold public meetings in the vicinity of each site to explain the early site permit process and to inform the public how they can be involved in the process.