

November 16, 2009

MEMORANDUM TO: Stewart L. Magruder, Branch Chief
Advanced Reactor Branch 2
Advanced Reactor Program
Office of New Reactors

FROM: Thomas J. Kenyon, Senior Project Manager */RA/*
Advanced Reactor Branch 2
Advanced Reactor Program
Office of New Reactors

SUBJECT: SUMMARY OF PRE-APPLICATION MEETING WITH BABCOCK &
WILCOX TO DISCUSS THE INTEGRAL TEST PROGRAM AND
HUMAN FACTORS PROGRAM FOR THE MPOWER REACTOR
DESIGN

On October 27, 2009, staff from the U.S. Nuclear Regulatory Commission (NRC) met with representatives from the Babcock & Wilcox Company (B&W) to discuss the integral test program and human factors program for the mPower nuclear reactor design. Enclosures 1 and 2 are the meeting agenda and meeting attendees, respectively.

The meeting opened with a presentation on B&W's mPower reactor design. B&W's slide presentation can be obtained from the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, MD. It is also available electronically from the Public Electronic Reading Room found on the Internet at the following web address: <http://www.nrc.gov/reading-rm.html>. From this site, the public can gain access to the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents in the Publicly Available Records (PARS) component of ADAMS. The ADAMS accession number for the presentation given during the public portion of the meeting is ML093100198.

In its opening presentation, B&W provided an overview of the mPower design, which is based on the German nuclear ship Otto Hahn that ran from 1968 to 1979. The current mPower design has been under development for 2 years. Each 425 MWt (125 MWe) integral reactor module consists of the reactor core, reactor coolant pumps, and steam generators located in the reactor vessel. The mPower reactor employs control rods but no soluble boron for normal reactivity control. The reactor uses approximately one-half height conventional light-water reactor (LWR) fuel rods (<5% enrichment) in a 17x17 array at 2000 psia. The designer expects a 4 - 5 year fuel cycle with the spent fuel pool being capable of holding up to 60 years of spent fuel within the underground containment structure.

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The designer is still in the process of determining whether two modules will feed one turbine-generator through a common steam header. The balance-of-plant design will employ conventional steam cycle equipment with an air-cooled condenser.

B&W then discussed their revised project schedule, as follows:

- submit a design certification application in the first quarter of calendar year (CY) 2012
- submit a combined license (COL) application in CY 2013
- begin construction in CY 2016
- begin operations of the lead plant in CY 2018 – 2020

The NRC staff noted that B&W appeared to be applying an ambitious timeline based on review timelines for the large LWRs currently under review. The staff pointed out that the more the designer sought to push the design envelope and deviate from the current regulatory requirements and guidance, the more likely policy and key technical issues would be identified that could cause a delay in the proposed schedule. B&W indicated that they intended to avoid raising such issues with the mPower design. The designer indicated that they wanted to identify any potential issues early during its pre-application interactions with the staff through the submittal of topical reports. B&W indicated that they intend to follow the 10 CFR Part 52 licensing approach while minimizing exemptions to 10 CFR Part 50 technical requirements.

B&W proposed to submit several topical reports addressing the design of the mPower design during its pre-application activities. The NRC staff stated that support for such pre-application reviews was limited by the availability of resources, and that its current reviews of COL applications took priority over pre-application activities. The staff indicated that when a submittal on a pre-application issue is submitted, it would look at the resources available to conduct the review to determine the level of support, if any, that could be assigned to it.

B&W then provided a high-level overview of the human factors approach that they intend to apply to the mPower design, indicating that they will comply with NRC regulatory guidance in this area. The designer stated that they have involved human factors experts early during the development of the design because their multi-module concept of operation (up to four modules in one control room) will likely lead to a heavy reliance on computers.

During the afternoon meeting, B&W discussed recent significant changes to the mPower design, described the integral test program that will be used to verify acceptable operation of the design, and discussed how the facility design will comply with the NRC's General Design Criteria.

S. Magruder

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The ADAMS accession number for the non-proprietary, redacted version of the slide presentation is ML093100360, and the non-publicly-available proprietary version of the slides can be found at ML093100361.

Enclosures:

As stated

Project No. 0776

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Meeting Agenda
Pre-Application Meeting with Babcock & Wilcox to
Discuss the Integral Test Program and Human
Factors Program for the mPower Reactor Design

Tuesday, October 27, 2009
10:00 a.m. – 2:30 p.m.
NRC Headquarters (Room T-10 A01)

TIME	TOPIC	LEAD
The following discussions were open to the public.		
10:00 a.m. – 10:10 a.m.	Introduction and Opening Remarks	NRC/B&W
10:10 a.m. – 10:40 a.m.	Overview of mPower Design	B&W
10:40 a.m. – 10:50 a.m.	mPower Project Schedule	B&W
10:50 a.m. – 11:30 a.m.	Human Factors Issues	B&W
11:30 a.m. – 11:40 a.m.	NRC Feedback & Next Steps	All
11:40 a.m. – 11:45 a.m.	Opportunity for Public Comment	Public
11:45 a.m.	Adjourn Open Meeting	
11:45 a.m. – 1:00 p.m.	Lunch	
The following session was closed to the public because proprietary information was discussed.		
1:00 p.m. – 1:45 p.m.	Integrated Test Plan	B&W
1:45 p.m. – 2:15 p.m.	Compliance with GDCs	B&W
2:15 p.m. – 2:30 p.m.	NRC Feedback & Next Steps	All
2:30 p.m.	Adjourn	

Meeting Attendees
Meeting with B&W on mPower
October 27, 2009

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DC B&W mPower

(Revised 11/10/2009)

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