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October 26, 2010 BW-JAH-2010-231

U.S. Nuclear Regulatory Commission (NRC)
ATTN: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Babcock & Wilcox Nuclear Energy, Inc.
Docket Number-PROJ0776
Project Number-776

Subject: Submittal of Revised Proprietary and Non-Proprietary Slides for a November 3, 2010 Meeting Between B&W Nuclear Engineering (NE) and NRC Staff

On October 14 and October 19, 2010, B&W NE provided a set of proprietary and non-proprietary slides to support a planned November 3, 2010 meeting with NRC the staff. Attachment 1 is a revised proprietary version of the slides that will be presented at the meeting. Attachment 2 is an affidavit that provides the justification for withholding identified information. Attachment 3 is a revised redacted version of the slides. Attachments 1 and 3 are intended to supersede the previously submitted slides.

Questions concerning these slides may be directed to Jeff Halfinger at 434-316-7507 (email: jahalfinger@babcock.com) or T. J. Kim at 434-382-9791 (email: tjkim@babcock.com).

Jeffrey A. Halfinger
VP, Technology Development
B&W NE

Robert E. McLaughlin
Director, Quality Assurance
B&W NE

T.J Kim
Licensing Director
B&W NE

JAH/jlr

Attachments – As Stated

cc: Joelle L. Starefos, NRC, TWFN 9-F-27
Stewart L. Magruder, Jr., NRC, TWFN 9-F-27

YGDI
NRD

Attachment 2

AFFIDAVIT OF Jeffrey A. Halfinger

STATE OF VIRGINIA

CITY OF LYNCHBURG

I, Jeffrey A. Halfinger, being duly sworn, do hereby depose and say:

1. I am a citizen of the United States of America. I am a resident of Lynchburg, Virginia. My birth date is November 4th, 1961.

2. I am the Vice President for Babcock &Wilcox Nuclear Energy, Inc. (B&W NE), located in Lynchburg, Virginia.

I have held this position since June 1, 2010. I have personal knowledge of the facts set forth in this affidavit, and if called and sworn as a witness in a deposition or before any court, I could and would testify competently under oath to these facts.

3. B&W NE requests that the NRC withhold from public disclosure the information marked as "B&W Confidential Commercial Information" regarding the B&W mPower™ reactor design discussed in the B&W NE letter dated October 26, 2010. This information is included in Attachment 1 to that letter, a revised package of slides for presentation at a closed meeting with the NRC staff scheduled for November 3, 2010.

4. I have personal knowledge of the criteria and procedures used by B&W NE in designating confidential commercial or financial information as proprietary and have been delegated the function to review the information to identify proprietary information and authorized to apply for its withholding. The need for confidentiality is driven by the following:

a) The information requested to be withheld reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) whose use by any of B&W NE's competitors, without a license from the submitter, would constitute a competitive economic disadvantage to B&W NE.

b) Use by a competitor of the information requested to be withheld would reduce a competitor's expenditure of resources, or improve its competitive position, in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.

c) The information requested to be withheld reveals aspects of privately funded development plans or programs of commercial value to B&W NE.

d) The information requested to be withheld consists of patentable ideas.

5. Specifically, the information identified in paragraph 3 above, is classified as proprietary because B&W NE has developed the conceptual and technical approaches regarding details of the B&W mPower™ reactor design features, disclosure of which could adversely affect B&W NE's competitive position by informing competitors of the degree of maturity and viability of the program, thereby motivating them to increase efforts to develop competing technologies. These features of the reactor design were privately funded by B&W NE and are of commercial value to B&W NE because of their nature in providing key elements of the B&W mPower™ reactor design analysis. All or parts of the approach described in the withheld material is patentable.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is a true and correct statement of facts.

Jeffrey A. Halfinger

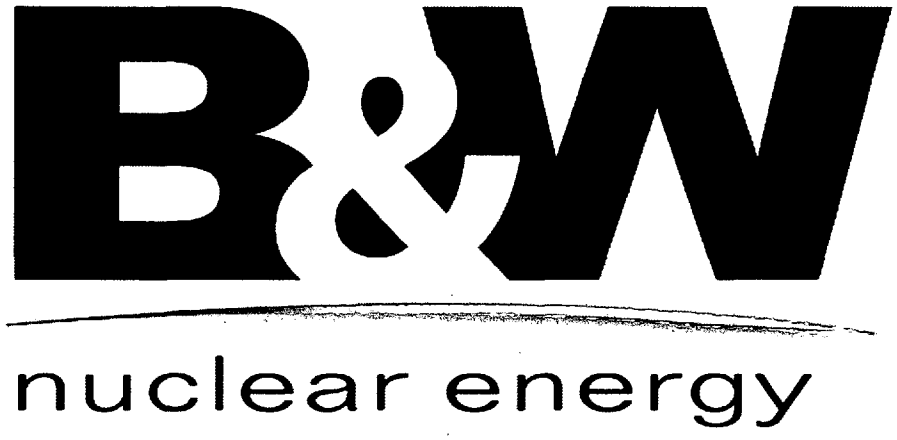
Subscribed and sworn to before me this 27th day of October 2010.

Notary Public

My commission expires: August 31, 2011

Attachment 3

Non-Proprietary Redacted Slides for November 3 Meeting between NRC and B&W NE Staff.



Meeting Between B&W NE and NRC Staff

November 3, 2010

Chet Poslusny

AGENDA

- Introduction
- B&W mPower Pre-Application Activities
- B&W mPower Reactor™ Design Overview
- B&W mPower Reactor Safety-Related I&C Overview
- Conclusions and Discussion

PRE-APPLICATION ACTIVITIES

Submittals to Date

- Quality Assurance Program for Design Certification[1]
- CHF Correlation Test and Development Plan[2]
- Design Overview[2]
- Integrated Systems Test Program[2]
- Core Nuclear Design Codes and Methods Qualification[1]
- Instrument Setpoint Methodology[1]
- CRDM Design Details and Development Plan[2]

1 = Topical Report, 2 = Technical Report

PRE-APPLICATION ACTIVITIES

Planned Submittals

PRE-APPLICATION ACTIVITIES

Technical Meetings

- Fuel/Core Design (C)
- IST Status and Details (C)
- I&C Architecture (C)
- Accident Analysis Codes and Methods (T)
- Design Overview Update (T)
- CRDM (T)
- Other Topics (TBD)

C = Complete, T = Tentative, TBD = To Be Determined

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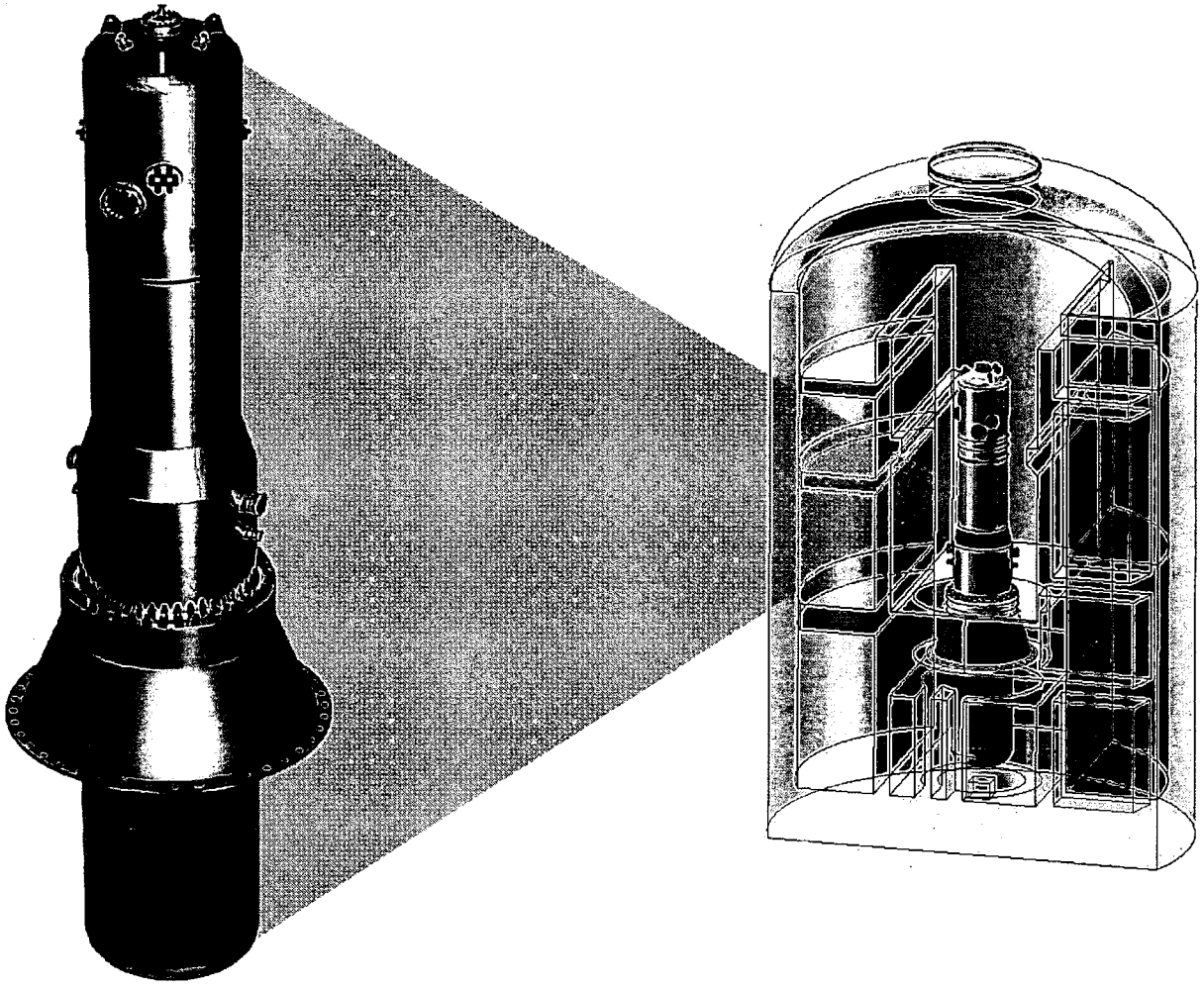
Design Overview

NRC Closed Meeting
3 November 2010

Mike Childerson
Nuclear Island Design Engineering

babcock & wilcox nuclear energy



Overview of the B&W mPower™ Reactor Design Briefing for the Nuclear Regulatory Commission

Topics

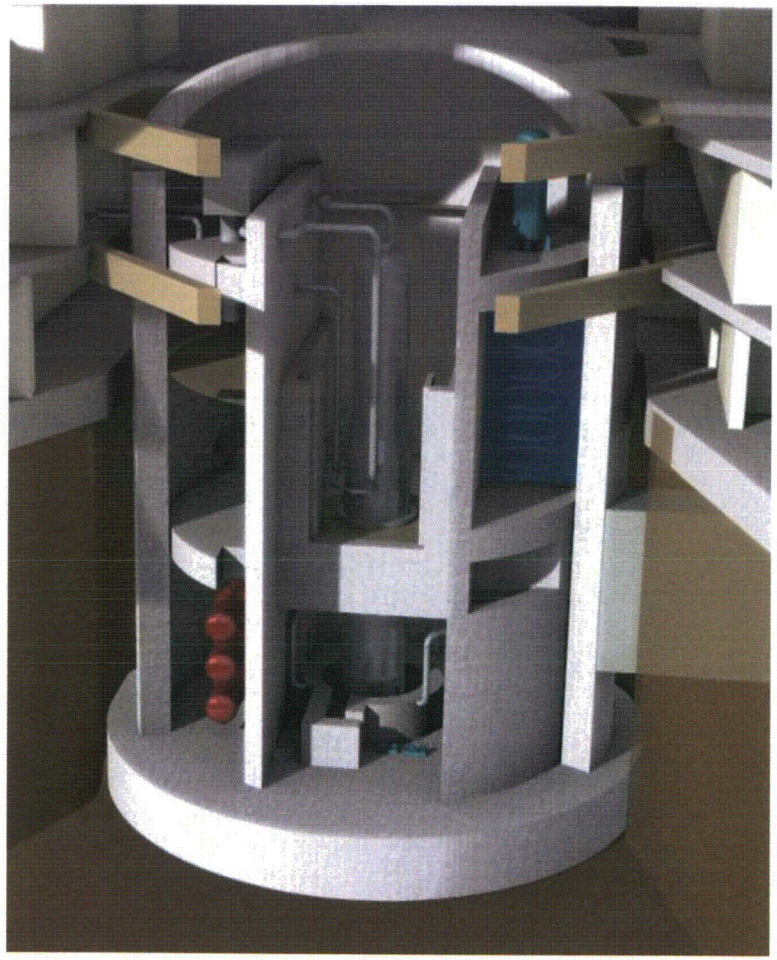
- High-Level Program Overview
- Technology Overview
- Development Testing Programs
- Summary

High-Level Requirements

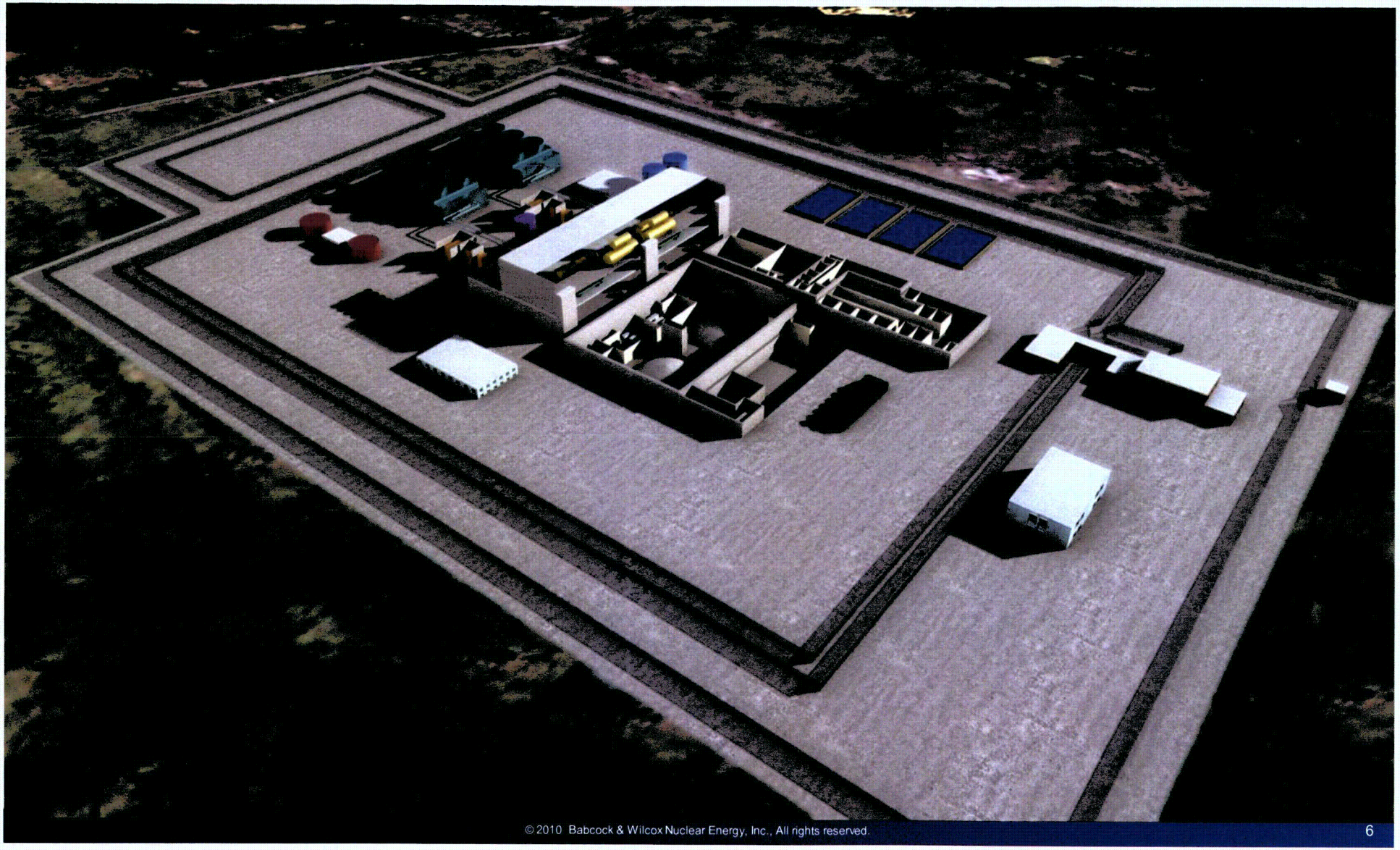
- 125 MWe plant gross output per module & 60-year plant life
- NSSS forging diameter allows domestic forgings, unrestricted rail shipment
- Passive safety requirements – emergency (diesel) power is not required
  - Minimize primary coolant penetrations, maximize elevation of penetrations
  - Large reactor coolant inventory
  - Low core power density
- Standard fuel (less than 5% enriched U-235)
- Long fuel cycle, 4+ year core life
- Spent fuel storage on site for life of plant
- No soluble boron in primary system for normal reactivity control
- Conventional / off-the-shelf balance of plant systems and components
- Accommodate air-cooled condensers as well as water-cooled condensers
- Flexible grid interface (50 Hz or 60Hz)
- Digital instrumentation and controls compliant with NRC regulations

Containment Requirements

- Underground containment and fuel storage buildings
  - Favorable seismic response
  - Missile protection
- Environment suitable for human occupancy during normal operation
- Simultaneous refueling and NSSS equipment inspections
- Leakage free
- Volume sufficient to limit internal pressure for all design basis accidents



Site Development



Lead Plant Baseline Schedule

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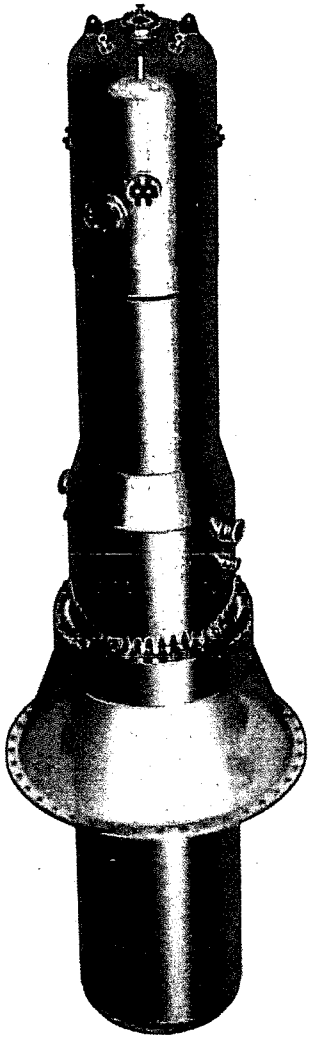
Technology Overview

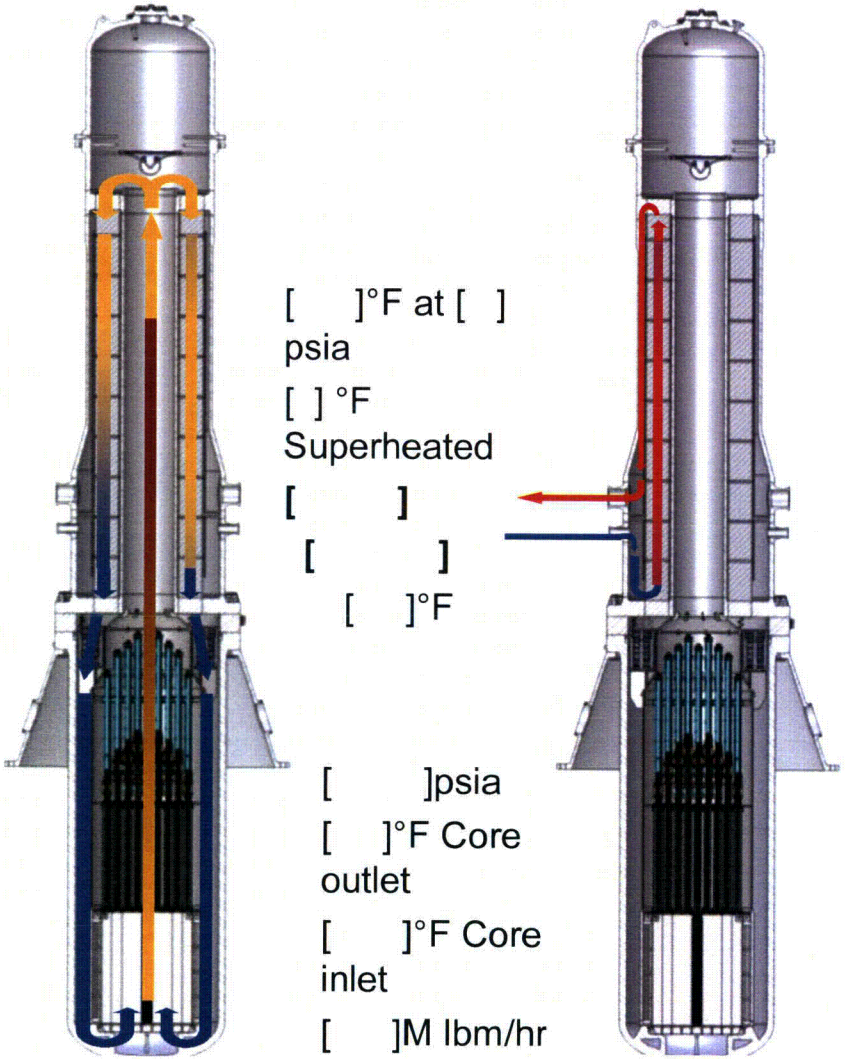
Integral Nuclear Steam Supply System



- Integrates core, steam generator, and pressurizer into a single vessel
- Control rod drive mechanisms (CRDMs) and primary coolant pumps inside vessel
- Reactor coolant pressure boundary penetration size and location minimize coolant loss during LOCA – core remains covered throughout the design basis LOCA
- Housed within a steel lined, reinforced concrete, dry containment

Integral design reduces overall plant complexity and enhances safety

Overall Reactor Arrangement



[ ]°F at [ ] psia

[ ] °F Superheated

[ ]

[ ]

[ ]°F

[ ]psia

[ ]°F Core outlet

[ ]°F Core inlet

[ ]M lbm/hr

Primary Loop

Secondary Loop

Pressurizer

Steam Generator Tubes

[ ]

[ ]

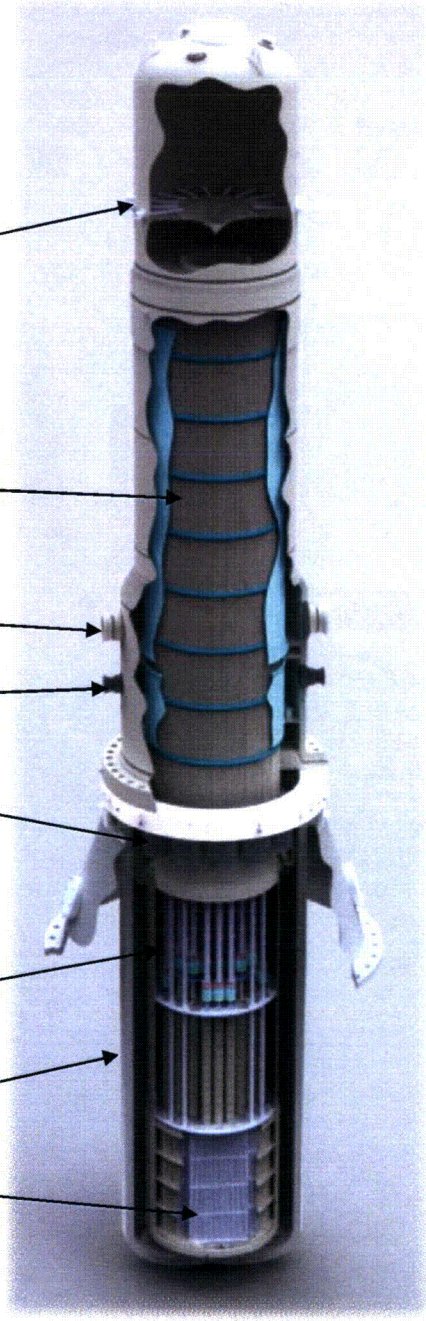
Reactor Coolant Pumps

Upper Internals with Control Rod Drive Mechanisms

Lower Vessel

Core

[ ]Tall]

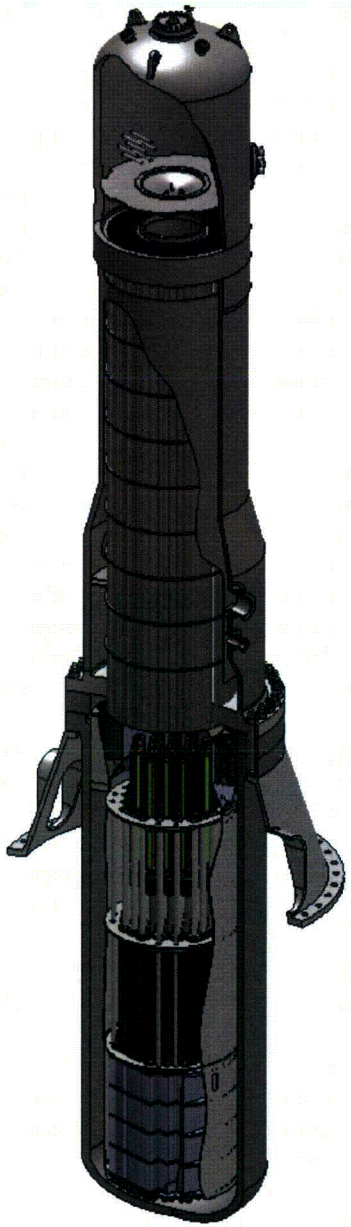


Overall Safety Approach

- Defense in Depth
  - Multiple barriers to radioactive release
  - Multiple systems to remove heat to protect those barriers

Fuel Pellet → Fuel Clad → RCS Pressure Boundary → Containment

- Passive safety systems
  - Safety systems rely on passive principles
    - Incorporate large heat capacity (RCS, containment)
    - Natural circulation (ECCS)
    - Water evaporation (Ultimate heat sink)
  - Safety systems initiated using stored energy to operate a small number of valves
  - Once initiated, passive safety systems protect the core for a minimum of 72 hours without operator action

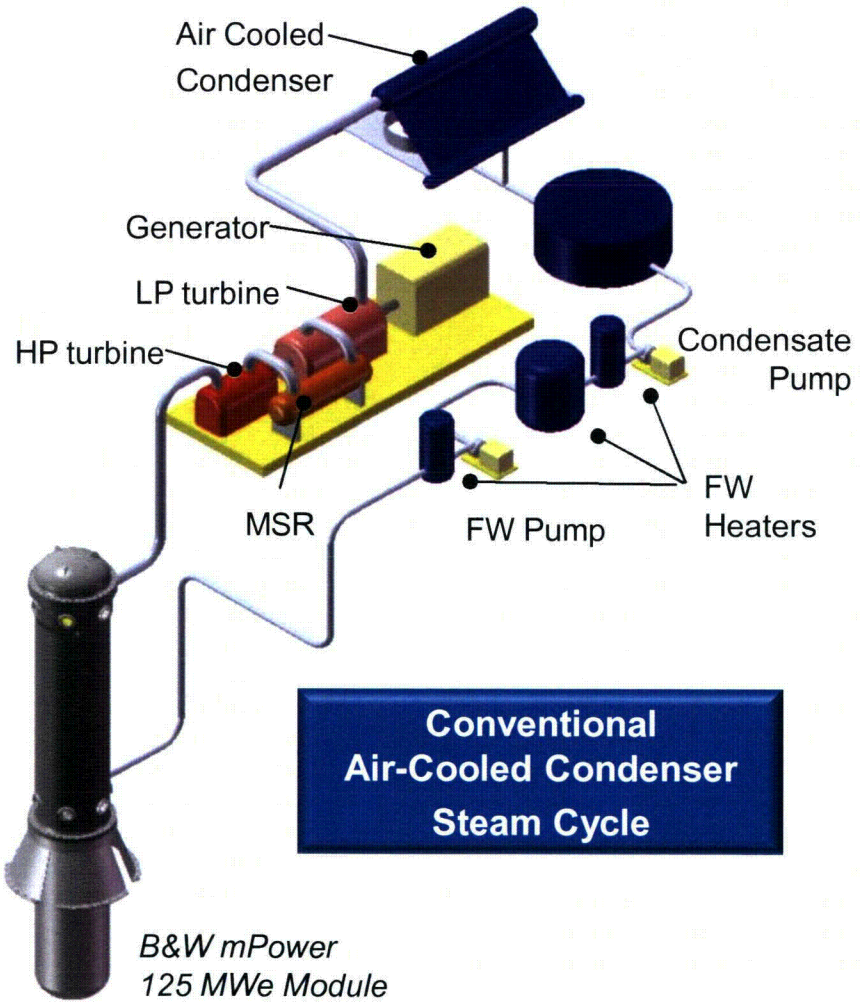


Inherent Safety Features

- [
  -
  -]
- Large reactor coolant volume
  - Large RCS volume [
    ]
  - More coolant [
    ]
- Small penetrations at high elevation
  - High penetration locations [
    .]
  - Small penetrations [
    .]

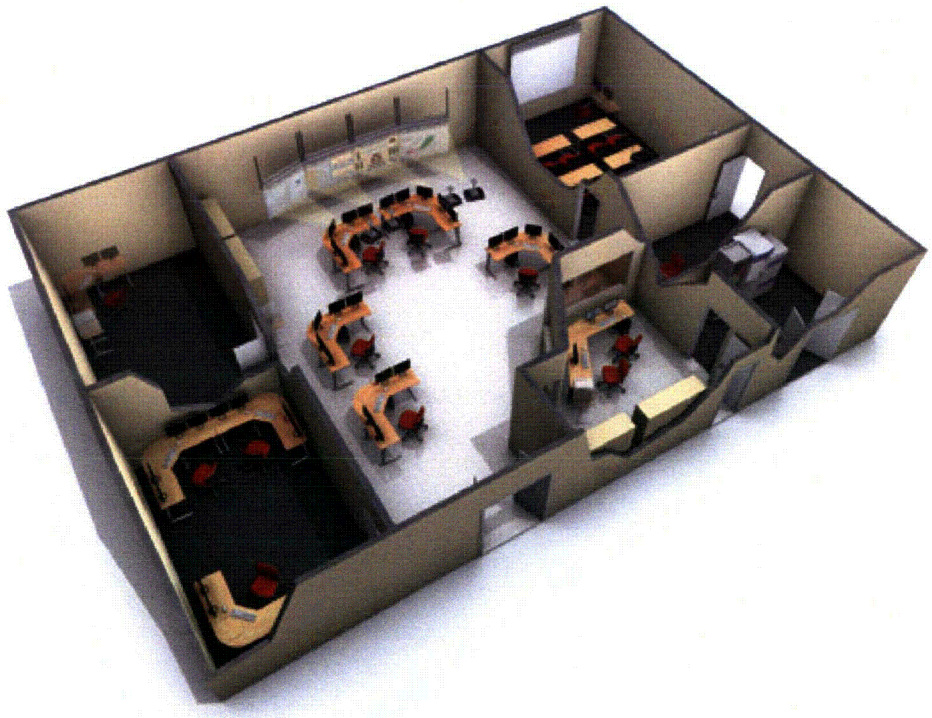
Balance of Plant Design

- Plant designed to produce a nominal 125 MWe gross
  - Air-cooled condenser (Baseline)
  - Water-cooled condenser
- Conventional steam cycle equipment (small, easy to maintain and replace)
- BOP operation not credited for design basis accidents
  - [ ]
  - All fuel can be cooled for a minimum of 72 hours without any BOP system



Instrumentation and Controls

- State of the art digital system
- Provides monitoring, control, and protection functions
- Separate safety and non-safety systems
- Implement lessons learned from current licensing activities
- Northrop Grumman under contract to develop I&C architecture



Development Testing Programs

Development Testing Programs

- **Component Tests**
  - Reactor coolant pump
  - CRDM
  - Fuel mechanical testing
  - CRDM / Fuel integrated test
  - Fuel critical heat flux
  - Emergency high pressure condenser
- **Integrated Systems Test (IST)**
  - [

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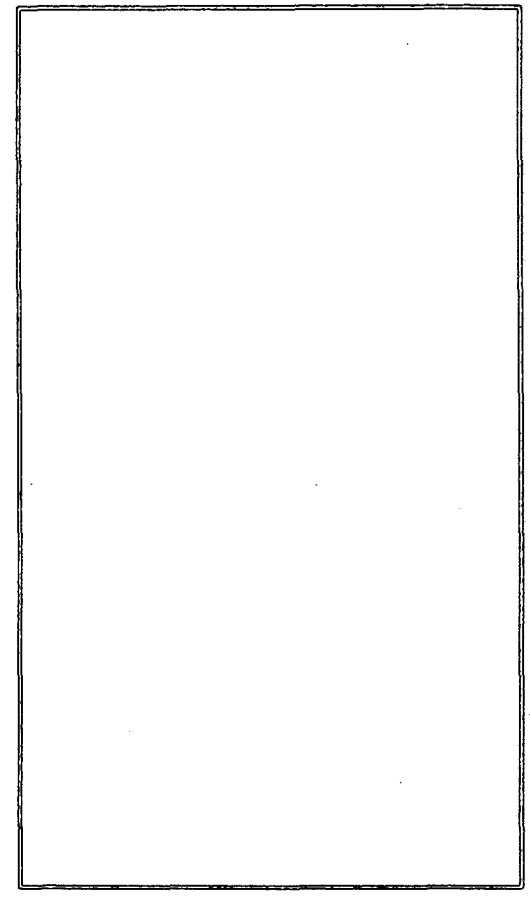

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IST Status

- System Design Description and P&ID Rev. 0 issued
- RELAP5 modeling in progress
- Site selected – CAER in Bedford County, VA
- Loop design, code analyses, and equipment selection
- IST Technical Report submitted to NRC in June 2010
- On schedule for start of testing [ ]

Summary

- NSSS utilizes an integral PWR design
  - Uses a single integral economizer once through steam generator to produce superheated steam
  - Internal reactor coolant pumps and control rod drive mechanisms
  - Internal pressurizer
- Passive safety systems, inherent NSSS safety features
- Long operating cycle without soluble boron
- Underground containment
- Spent fuel storage on site for life of plant
- Reactor plants for multiple module designs [

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Safety-Related I&C Overview

NRC Closed Meeting
4 November 2010

Brian Arnholt
Advisory Engineer, Systems Design

Key Design Attributes

[ ]I&C System

- [

]

Diverse Actuation System (DAS)

- [

]

Trade Studies to Make Key Design Decisions

I&C System Overview

[

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Plant Protection Layer Block Diagram

[

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Protective Subsystem Block Diagram

[

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Regulatory Conformance

I&C Architecture Based on Traditional Echelons of Defense

- Control System, reactor protection system, engineered safety featured actuation system and monitoring and indicators

[ ]

- Design conforms with IEEE 603 and 7-4.3.2
- Design subject to D3 analysis per NUREG-6303, BTP 7-19 and ISG-2
- Adequacy of diversity will be assessed in accordance with NUREG/CR-7007
- [ ]

No Anticipated Deviations from DI&C ISG's

- Key ISG guidance with regard to communications, prioritization, HFE and multidivisional control and display stations will be incorporated.
- Design incorporates manual initiation features
- Design will be subject to software vulnerability assessment with respect to cyber security

Next Steps

Determine Control/Actuation Strategy

- Manual, automatic, component-level, system-level, diverse controls (RG 1.62, IEEE-603)

Control and Command Prioritization

- Priority evaluations between reactor protection system, engineered safeguards system and diverse systems

Diversity Strategy and Analysis

- Apply guidance for addressing common cause failures
- Diversity for manual control/actuation

Equipment Layout and Interfaces

- Communication interfaces, physical arrangements

Questions and Discussion