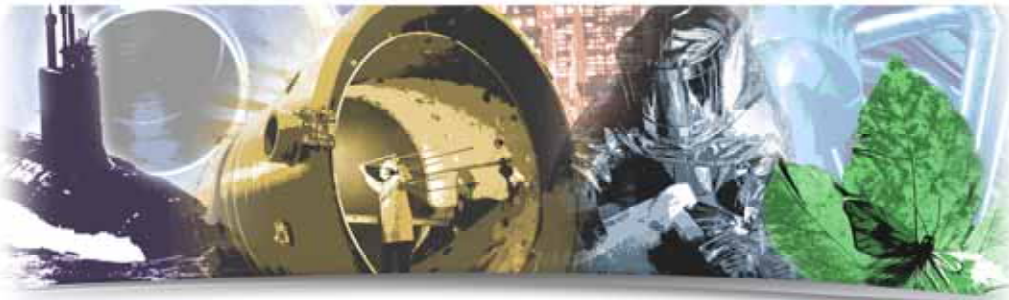


babcock & wilcox modular nuclear energy



A practical, scalable, modular ALWR

**NARUC Summer Committee Meeting
Sacramento, CA**

**Mike Shepherd
VP Global Sales, B&W Nuclear Energy**

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General Overview 08-01-10

I am happy to be here. The Babcock and Wilcox Company has a long history being a key innovator in the power industry, starting with Thomas Edison. When Mr. Edison wanted to build the first central generation station, in New York City, he came to B&W, who had developed a unique boiler design, the first water tube boiler, to provide the boiler for Pearl Street.. We have been involved with the power industry ever since. Our company is over 140 years old, and still true to our American roots, with manufacturing facilities in Ohio, Indiana, Tennessee, and Virginia.

McDermott International

J. Ray
McDermott



The Babcock & Wilcox Company (NYSE est. 8/2/10)

Government Operations

B&W Technical
Services Group,
Inc.



B&W Nuclear
Operations Group,
Inc.



Commercial Operations

B&W Power
Generation Group,
Inc.



B&W Nuclear
Energy, Inc.
April 1, 2020



Clean Power Technologies
High-Consequence DOE Operations
Advanced Engineering and Manufacturing

Highlight the new B&W NE, consolidates all B&W's commercial business under one leader; B&W is building an OEM organization around mPower that will also be able to serve the nuclear industry.

Today's Industry Imperatives

- Don't "bet the company" on one project
- Practical, proven technology
- Utilize existing nuclear infrastructure
- "Repower" carbon-intensive facilities
- Incremental power additions



B&W then surveyed the potential customer base for our entry into the NSSS market again. It became very clear there were some key important issues that the power companies were focused on. The message was loud and clear – if we could help address these imperatives, with a new offering, we would be successful. The Recession of 2009 really brought this to the forefront – a lot of power companies had to review their long term load projections, which, up until this time, had projected moderate load growth in this country. The reality check of 2009 has resulted in a more realistic projection – which is lower, and longer. Some power companies, who were embarking on large, expensive new nuclear programs realized these projects could have resulted in having more power than needed in certain markets, as the economy has slowed down, and load demand has been re-forecasted.

A Generation III++ Reactor



- Integral 125 MWe modular reactor
- Proven Advanced LWR technology
- Simple, passively safe design
- Utilizes "industry standard" PWR fuel
- Built in North America, in B&W factories
- Dry containment – no suppression pool
- No active core cooling systems
- Passive decay heat removal
- No emergency AC power – batteries only
- Reactor installed after construction
- Spent fuel storage for 60-year plant life

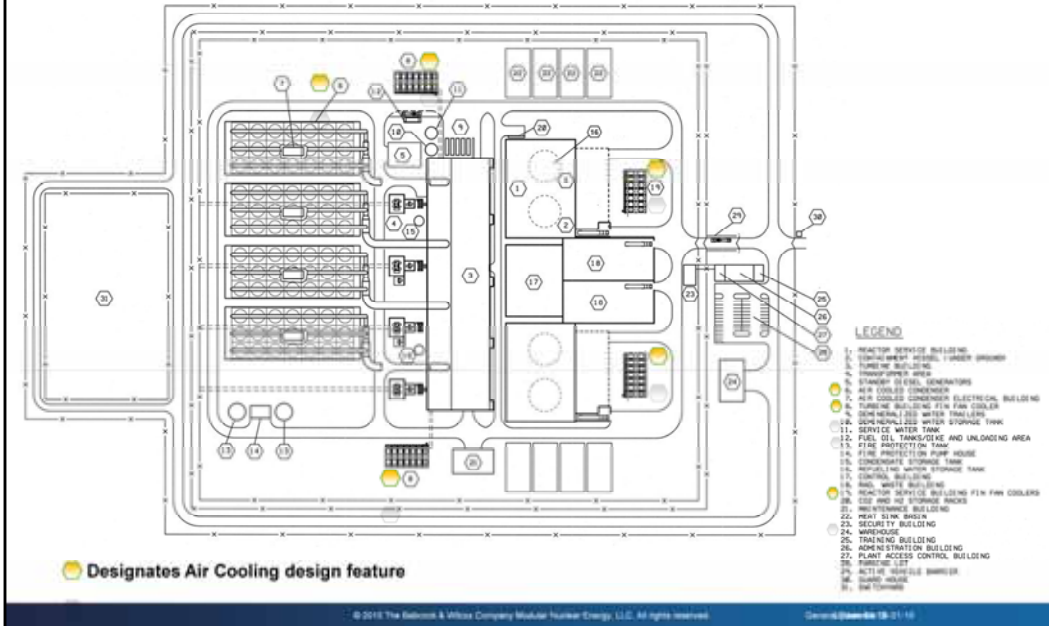


Mowry bullets - Too many bullets on slide. Audience will get lost. Suggest maximum of 3-4 for each element. Here are the 4 for MNE:

Flexible, scalable, nuclear plant
125MWe ALWR integral reactor
Proven technology, passively safe
Project schedule and cost certainty

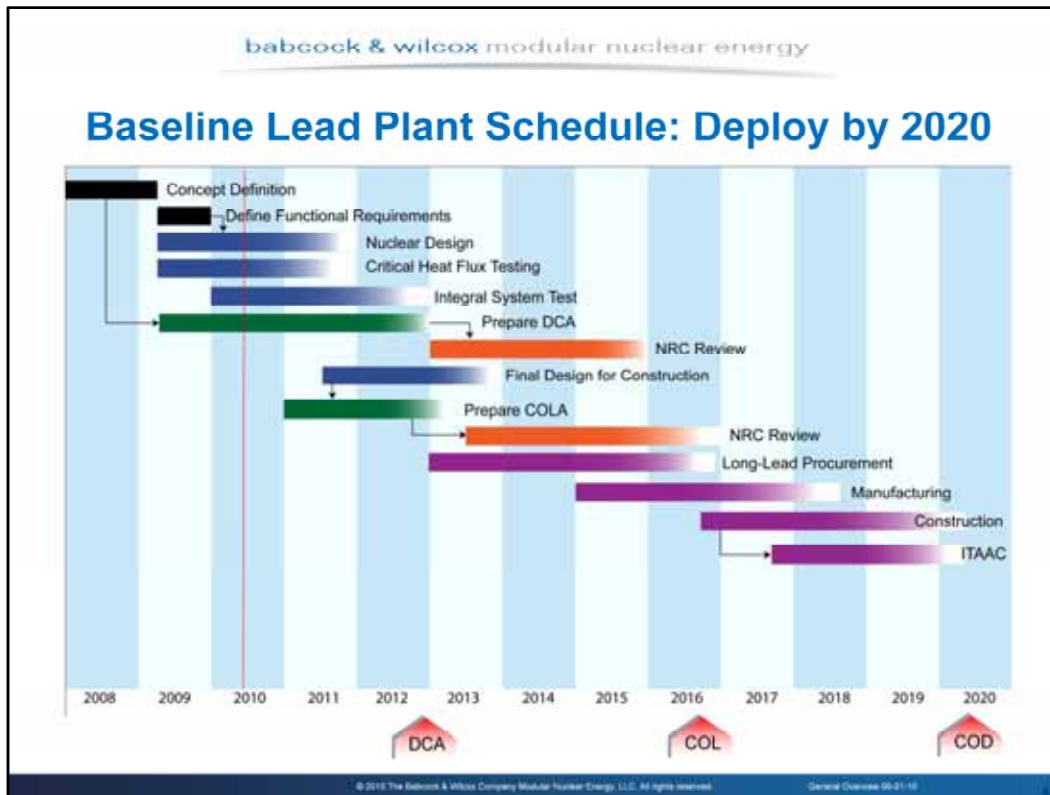
- **Natural circulation decay heat removal system for emergency/refueling cooling**
- **Primary coolant treatment system within containment**
- **Steam generator inspection within containment**

Four Reactor Plant Conceptual Layout



The footprint of a four reactor plant is 46 acres, inside the fence, and an additional estimated 5 acres for switchyard, depending on customer's configurations.

ACC uses 50gpm; Water cooled will use ~1950gpm



Highlights:

IST

- 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
 - Heaters ordered; Pump vendor selection in process; Power supply and control system design progressing; Loop code and structural analysis progressing; Building design changes initiated (footings, tower, & equipment layout)
- IST Technical Report scheduled for submission to NRC in June 2010; On schedule for start of testing in mid 2011
- CHF
 - Expand the B&W CHF data base needed to design and license the B&W mPower™ core
 - Tests performance by Stern Laboratories in Hamilton, Ontario

• Three power shapes: Normal cosine (3 arrays); Bottom skew; Top skew

Licensing Strategy

Design Certification

- Proven Light Water Reactor technology and existing regulatory framework
- Minimize deviations and exemptions
- Leverage GEN III+ licensing experience – ie. Digital Instrumentation & Control
- Maximize pre-application efforts – License Topical Reports, technical reports
- Customer input including Consortium, Industry Advisory Council, and EPRI
- Comprehensive testing, validation & verification, and independent reviews
- Utilize previous Design Certification Document experience

SECY-10-0034

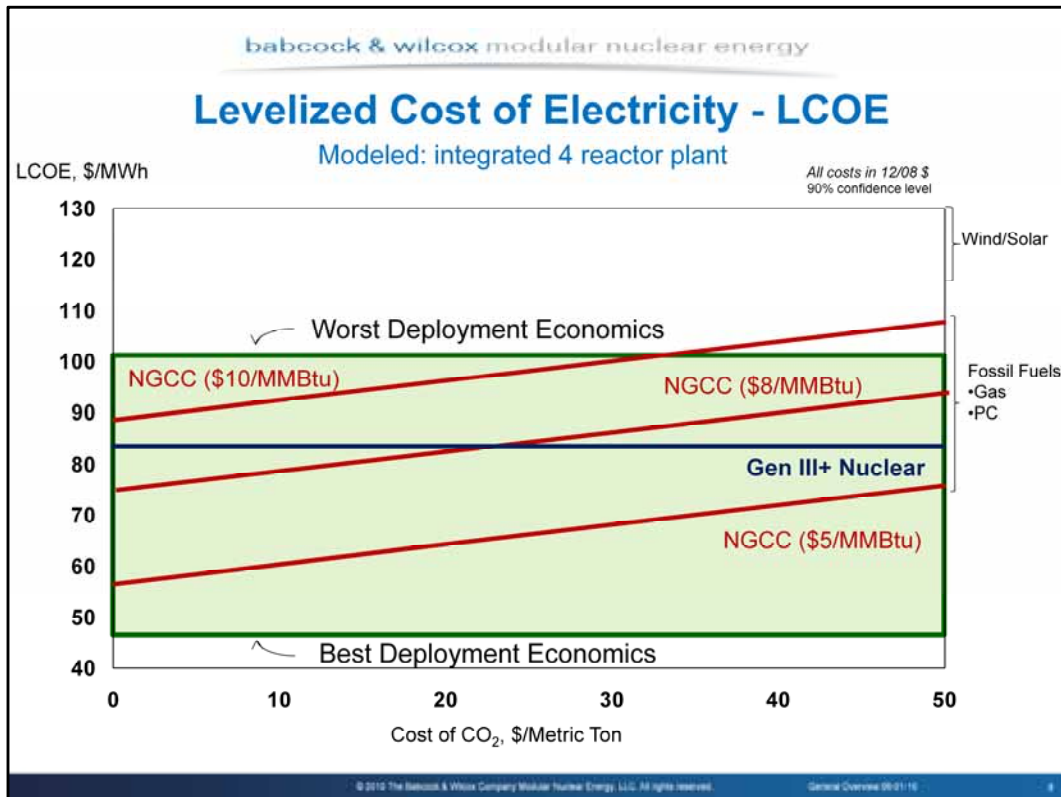
- Regulatory policy issues potentially affecting economic viability of SMRs
- Collaboration with NEI, ANS, EPRI, and others
- Timely resolution of the issues required for a “build” decision

Reference –Combined Operating License (R-COL)

- Preparation of COL could begin as early as 2011
- Utilization of Limited Work Authorization

Goal – R-COL by 2016 to Support Construction/Deployment by 2020

How does consortium interface with SECY – 10-0034?



B&W has been doing detailed assessments of both estimated overnight capital costs and annual operations and maintenance costs, based on current level of design. An industry accepted metric for evaluating different type of generation is the life cycle costs of electricity. When we compare and integrated 4 pack – 4 reactor units built at the same time, to other typed of generation, mPower is demonstrated as being competitive with all typed of generation ,when favorable economics are applied – a plant built in a regulated environment with construction while in progress reimbursements which will lower the overnight capital costs.

Questions?