Layla Sandell
Manager
New Nuclear Plant Deployment

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Presentation Outline

• U.S Interest
• New Plant Announcements
  – Worldwide
  – U.S.
• Overcoming Challenges to New Plant Construction
• EPRI’s Role
Drivers for New Nuclear Power
Why Nuclear Energy? ... plant performance, and economics have steadily improved

- Long-life generation asset – 60+ years with license renewal
  - Mature technology - commercial nuclear power generation since 1957
- Excellent plant management and operational experience
  - Annual average capacity factor of about 90% for the past five years
- Well-developed safety culture and effective regulation
- Lowest production costs (except hydro power)

Nuclear Capacity Factor is at an All-Time High

Nuclear performance has improved 38%

86.8% in 1999
89.6% in 2000
90.7% in 2001
91.9% in 2002
89.4% in 2003
90.5% in 2004

Source: Nuclear Energy Institute

U.S. Electricity Production Costs
Worldwide New Plant Construction and Planning

Data from WANO and IAEA
Planning = Planned, Ordered, or Proposed
U.S. Utility Announcements

- Exelon Clinton (IL)
- Entergy River Bend (MS)
- Progress Energy Harris (NC)
- Dominion North Anna (VA)
- UniStar - Calvert Cliffs (MD) or Nine Mile Point (NY)
- Southern Company Vogtle (AL)
- Nustart – TVA Bellefonte (AL)
- Nustart – Entergy Grand Gulf (MS)
- STP South Texas Project (TX)
- Entergy River Bend (MS)
- Progress Energy (FL)
- SCE&G VC Summer (SC)
- Florida Power & Light (FL)
Challenges to New Plant Construction

**Technical**
- New passive designs
- Standardization
- Fuel cycle optimization

**Financial**
- Financing
- Risk mitigation
- Government support

**Regulatory**
- New licensing process
- Demonstration projects
Westinghouse AP1000
General Electric ESBWR
AREVA U.S. EPR

Source: AREVA
General Electric ABWR
Challenges to New Plant Construction

Technical
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- Standardization
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Regulatory
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DOE Nuclear Power 2010

• Program initiated in February 2002
• Based on Near-term Deployment Roadmap
• Focused on addressing technical, regulatory and institutional challenges
• Government/industry cooperative effort
  – 50-50 Cost-shared industry projects
  – Market-driven

Program Goal Pave the way for industry decisions to build new advanced light water reactor nuclear plants in the United States that will begin operation early in the next decade.
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<th>ESBWR Program Review</th>
<th>EPR Program Review</th>
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**Source:** U.S. NRC
Challenges to New Plant Construction

Technical
- New Passive Designs
- Standardization
- Fuel Cycle Optimization

Financial
- Financing
- Risk Mitigation
- Government Support

Building new Nuclear Plants

Regulatory
- New Licensing Process
- Demonstration Projects
Energy Bill of 2005

• Production tax credits
• Government guaranteed debt financing
• Standby support – risk insurance
• Price-Anderson Act extension
EPRI Activities in Support of New Plant Deployment

- Security
- Environmental Benefits
- Seismic
- Planning/Scheduling
- Design & Licensing Support
- URD
- Building New Nuclear Plants

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Conclusion

• The U.S. nuclear industry is working to overcome technical, financial, and regulatory challenges to new plant deployment with support from EPRI and the Department of Energy

• EPRI has provided technical solutions for designs, seismic, staffing, and planning/scheduling issues, and continues to work in these areas

• Significant progress has been made in recent years toward demonstrating the new plant licensing process......so that,

New Nuclear Power Plants Can Be Built in the United States
Future Generations are Depending on Us......

Since 1979, more than 20% of the Polar Ice Cap has melted away.

Photo: NASA ©2003 NRDC