

Realistic Expectations For New Nuclear Plant Construction

18th Annual Burns and Roe Seminar

April 15, 2008

Today's Briefing

- Review of 2007 operating performance
- New nuclear plants: progress and expectations
- Understanding and managing the risks of new nuclear plant construction
- The challenges

Review of 2007

Operating Performance



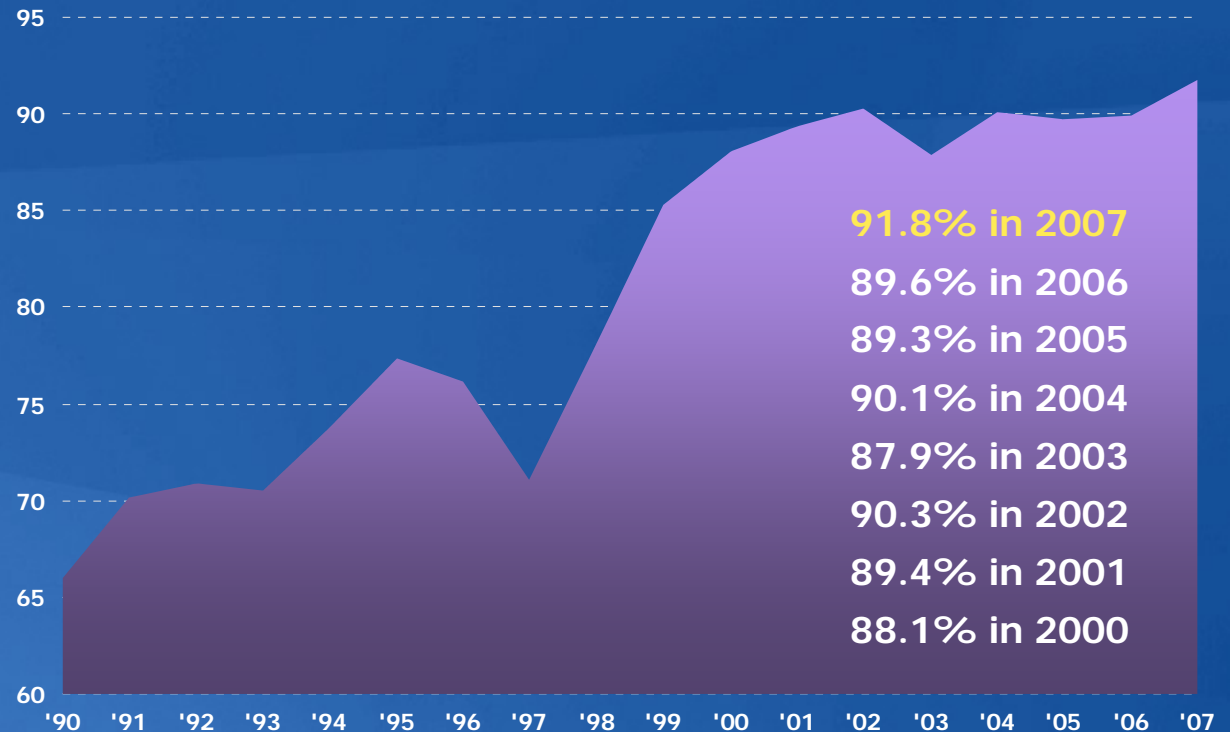
0.16%	-1795.63	-8.49	▲	0.20
	-1791.97	-4.83	▲	0.20
	-1795.09	-0.54	▼	0.15
	767.89	0.01	▲	0.10
	778.33	1.34	▲	0.10
	4443.87	7.63	▲	0.20
	2916.60	-4.89	▼	0.15
0.05%	1112.11	-0.73	▼	0.05
	1787.63	8.49	▲	0.35
	1791.97	4.83	▲	0.20
0.38%	-1295.09	-0.54	▼	0.15
0.27%	767.89	0.01	▲	0.10
	700.33	1.34	▲	0.10
0.13%	443.83	5.63	▲	0.35
	416.60	-6.89	▼	0.05
0.10%	412.11	-0.73	▼	0.15
0.17%	795.63	8.49	▲	0.35
	107	4.83	▲	0.20

Sustained Reliability and Productivity

U.S. Nuclear Plant Average Capacity Factor

Highlights

- Fewer outages in 2007 (55 in 2007, 65 in 2006)
- Average outage duration in 2007 = 40.5 days

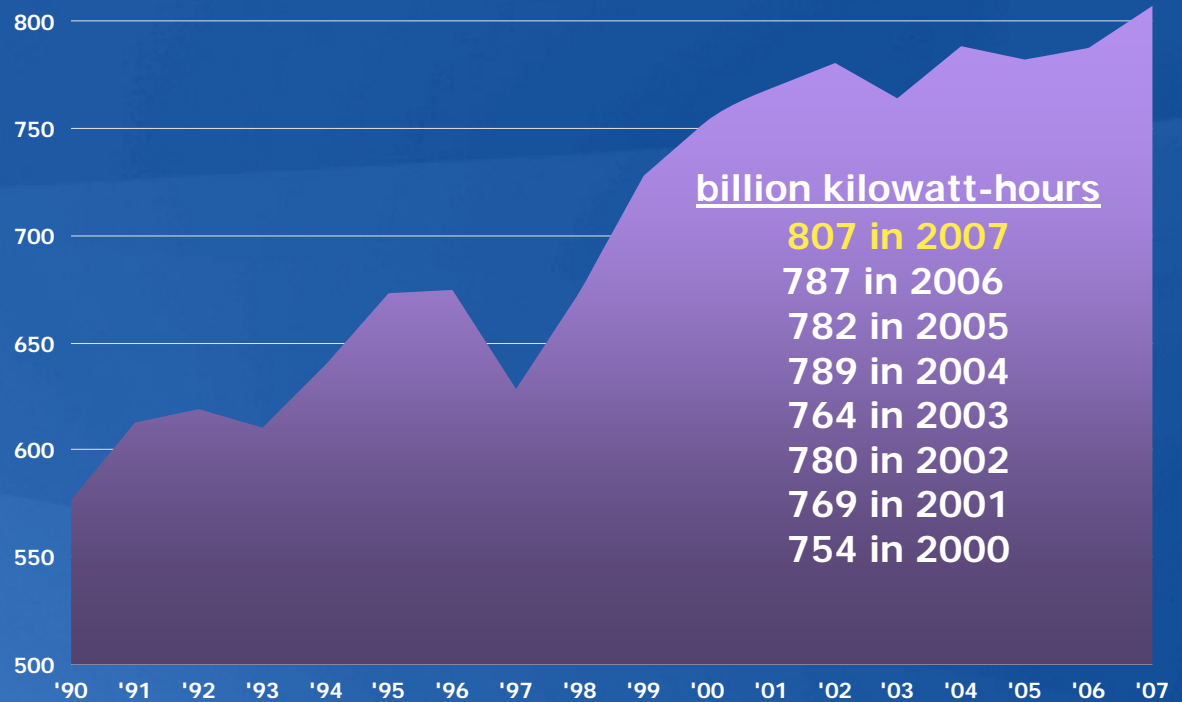


Output at Record Levels

U.S. Nuclear Generation (billion kilowatt-hours)

Highlights

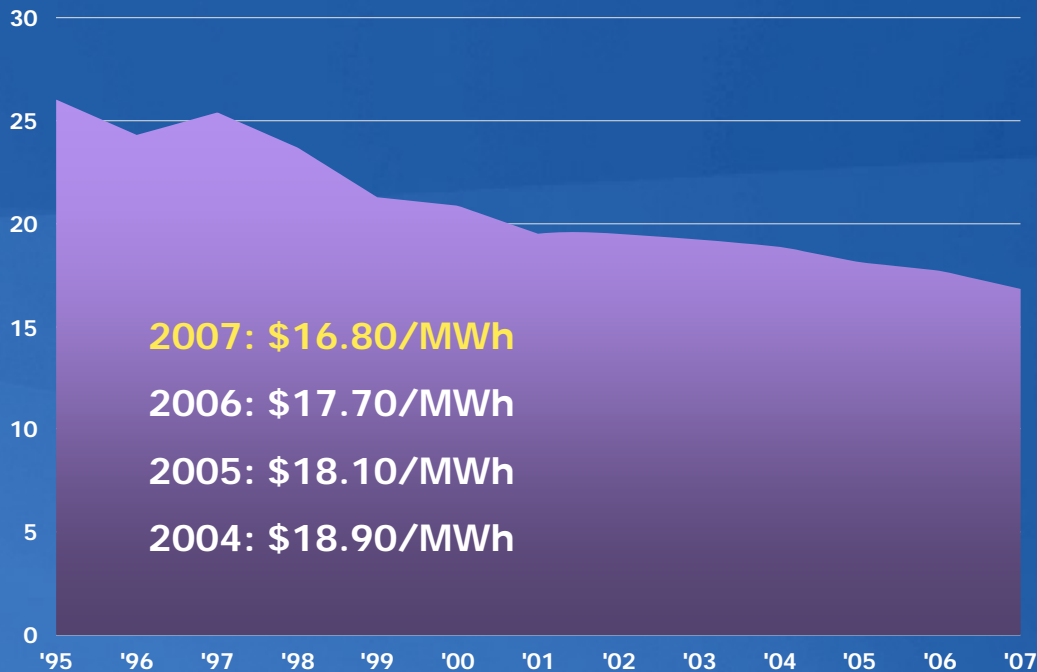
- 5,222 MW of power uprates approved
- 912 MW of uprates pending
- 1,751 MW of uprates expected



Sources: Global Energy Decisions Energy Information Administration, U.S. Nuclear Regulatory Commission, NEI estimate for 2007

Solid Economic Performance Continues

U.S. Nuclear Production Cost (2007 \$ per MWh)



Sources: Global Energy Decisions, NEI estimate for 2007

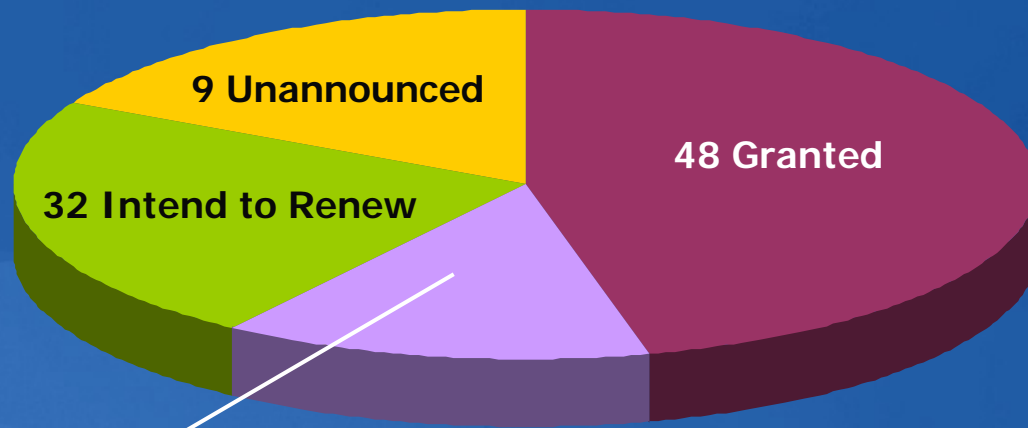
Solid Margins

- \$16.80/MWh production cost implies busbar cost of \$22-23/MWh
- Average prices in selected power markets in 2007:

Entergy	\$46.71/MWh
ERCOT	\$49.71/MWh
NEPOOL	\$69.12/MWh
NYISO	\$68.62/MWh
PJM West	\$59.84/MWh

Other Key Highlights From 2007

License Renewals Continue ...



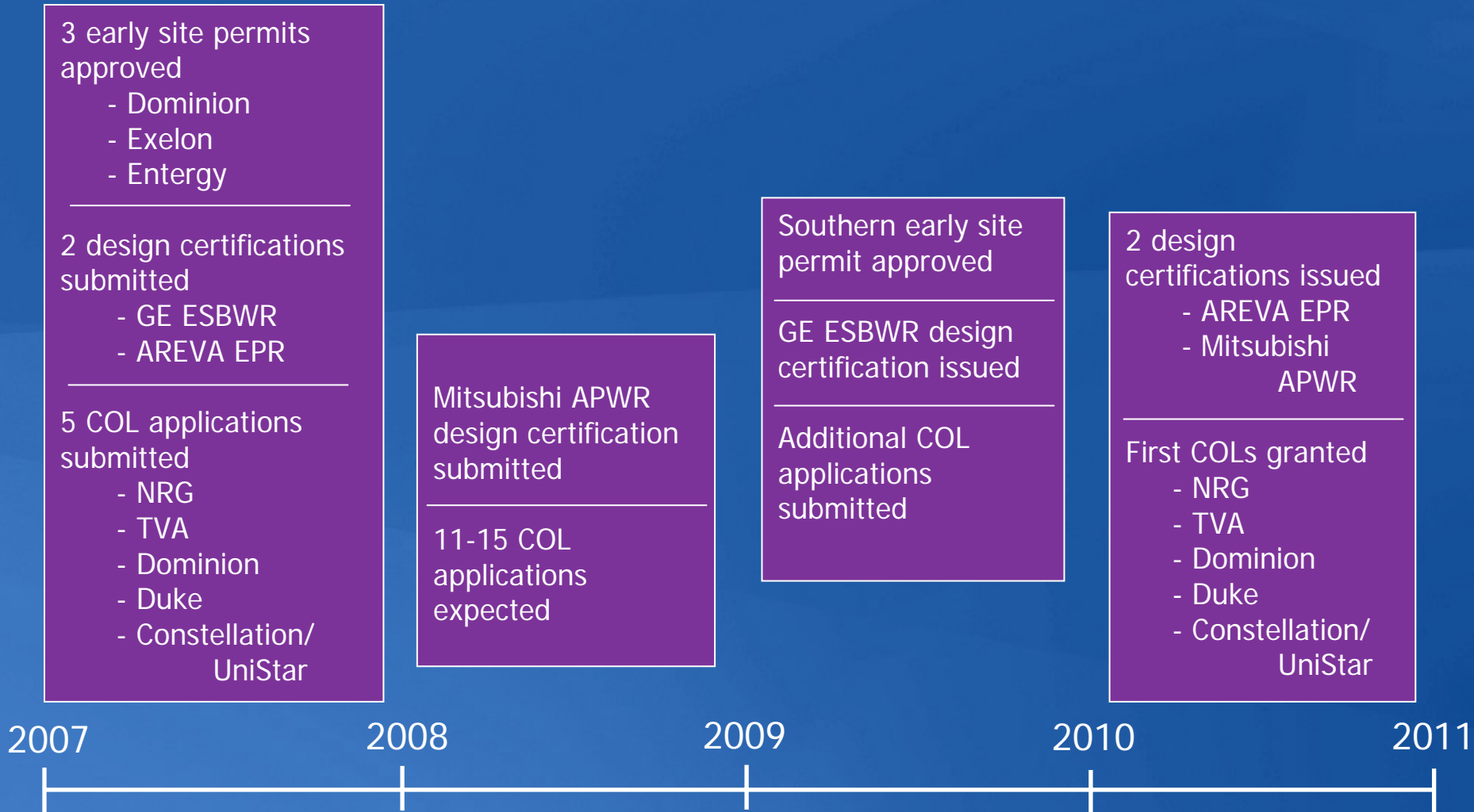
15 Under NRC Review
6 Filed in 2007

... And Plant Restarts

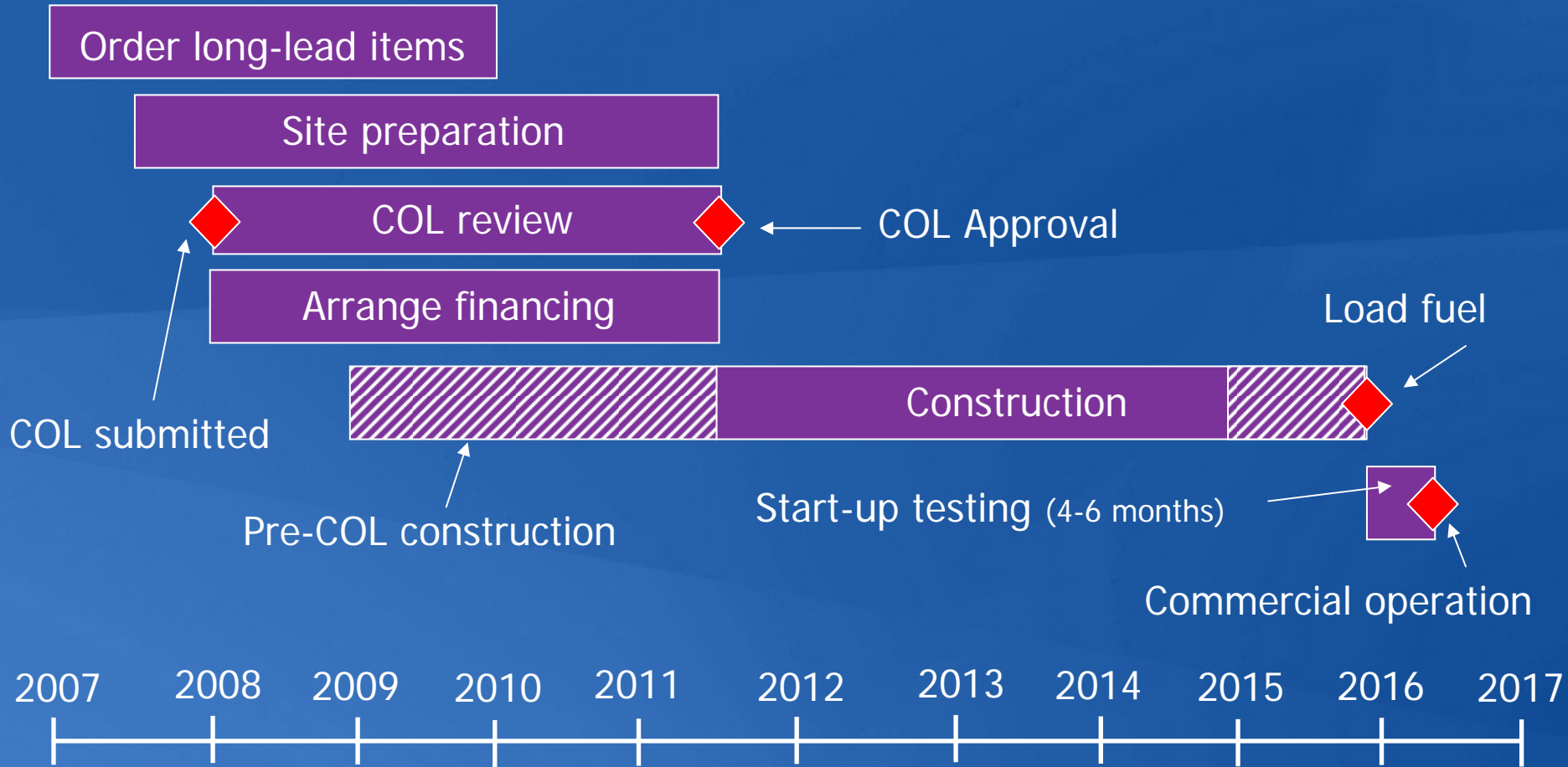
- TVA's Browns Ferry 1 back in service May 2007 (5-year, \$1.8 billion project)
- TVA approved Watts Bar 2 completion August 2007 (5-year, \$2.5 billion project)

New Nuclear Plants: Progress and Expectations

Progress Toward New Plant Development



The First Wave: From COLA to Commercial Operation



Expectations for the Future

Initial wave: 4-8 plants on line
by 2015-16

Suppliers ramp up
component manufacturing
capability

Second wave under
license review,
conducting pre-COL
site work

Second wave begins construction when it is
clear that first wave can be licensed and built
on time and within budget



A Realistic Perspective

- Most projects still in early stages of development
- Should expect ...
 - changes in project ownership and structure
 - decisions deferred pending clarity on cost, other factors
 - decisions to suspend project development
- Positive signal: companies will not proceed unless they are confident that all risks identified, removed, mitigated

Managing the Risks of New Nuclear Plant Construction

In Retrospect ...

"The Perfect Storm"

- Rapidly changing technology and regulatory requirements
- Poorly designed, poorly implemented two-step licensing process
- Poor project management
- Adverse business conditions

Then and Now: The Biggest Difference

- The 1970s and 1980s
 - Cost overruns, schedule delays
 - Capacity factors in mid-50% range
 - Refueling outages 100-plus days
- Today
 - Major overhauls, plant restarts on time, on budget
 - Capacity factors in the 90% range
 - Refueling outages 20-30 days

The industry operating to today's high standards is the industry that will build new nuclear plants.

Focused, Coordinated Program To Manage the Risks

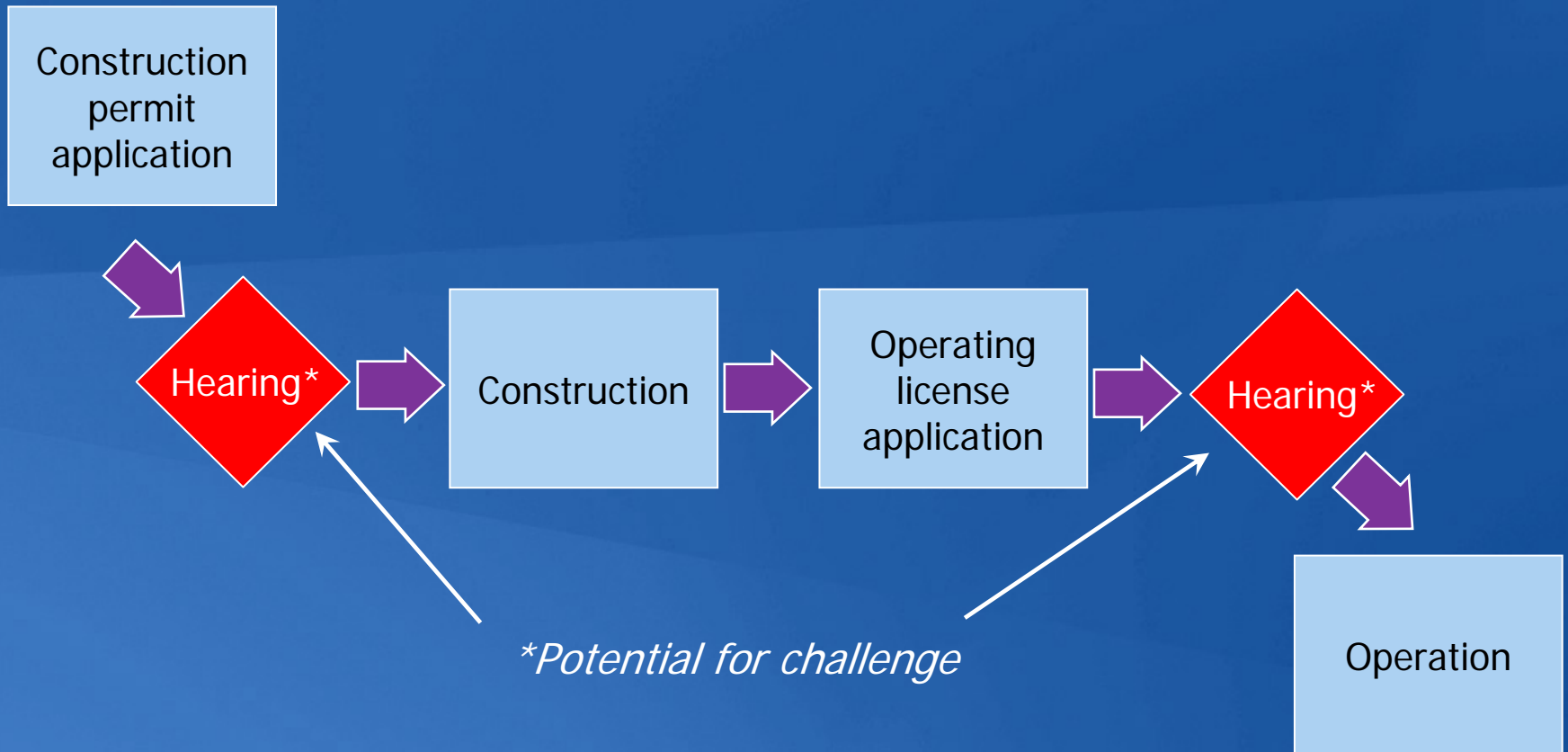
- Started more than a decade ago
- Performed systematic assessment of what went wrong
- Approached new nuclear construction as risk-management exercise
- Assembled hundreds of industry experts in strategic areas

Removing Risk From the Licensing Process

- Restructured licensing process
- Mature technology, stable regulatory requirements
- Streamlined hearing procedures
- More oversight of licensing boards
- Design-centered review groups and standardization
- “Sign-as-you-go” ITAAC verification
- High threshold, limited window for intervention after COL approval

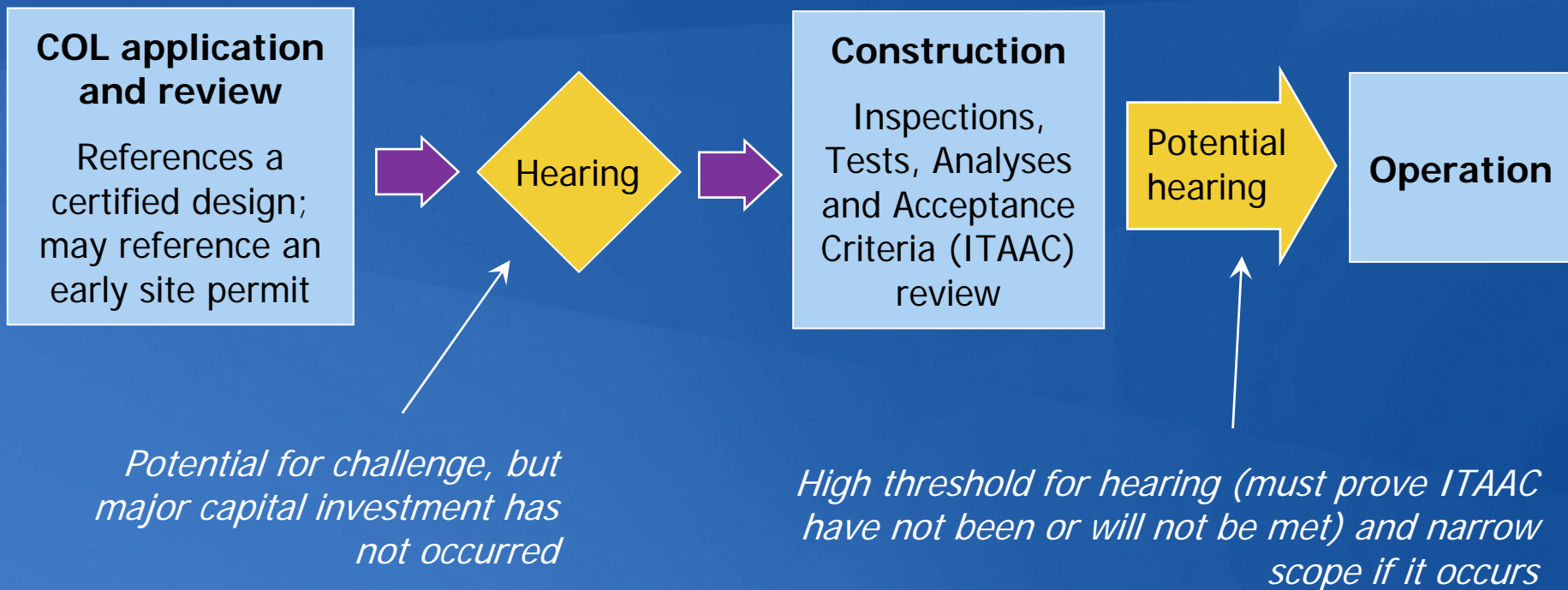
Old Two-Step Licensing Process

(10 CFR Part 50)



New COL Process Reduces Uncertainty

(10 CFR Part 52)



Project Management: Lessons Learned

Provide Road Map for Success

- Detailed design complete before construction
- Integrated engineering and construction schedules
- Standardization
- Focus on quality assurance
- Safety-conscious work environment: effective corrective action, worker concern programs
- Improved planning and construction management tools
- Improved construction techniques

Successful Project Management: Browns Ferry 1

- As complex as building a new plant
- 5-year, \$1.834 billion project completed on time and within budget estimate
- Refurbished or replaced nearly all systems, components
- Simultaneously completed extended power uprate

Successful Project Management: Fort Calhoun Overhaul

- Replaced many major components
- Completed refueling outage at the same time
- \$417 million project completed approximately \$40 million under budget, 5 days ahead of schedule

Supply Chain Starting to Respond

- Supply chain adequate for “first wave”
- Long-lead materials (e.g., forgings) already fabricated or ordered for first wave
- Component manufacturing will respond to sustained demand
- Early signs that suppliers are gearing up

Addressing the Work Force Challenge

- Nuclear engineering enrollments up dramatically
 - Undergraduate: from 470 in the 1998-99 academic year to 1,933 in 2006-07
 - Graduate: from 220 in the 1998-99 academic year to 1,153 in the 2006-07 academic year
- Joint initiatives with organized labor and the Departments of Labor, Education, Defense
- Industry-community college programs in 14 states
- Skilled crafts: collaborative programs in 10 states

Economics of New Baseload

- New baseload capacity will be expensive
- With financial incentives, busbar costs for first new nuclear plants are in the \$70-80/MWh range
 - Loan guarantees from the federal government
 - Supportive rate policies at the state level
- New nuclear plants will be competitive with other new sources of baseload electricity

The Challenges



Uncertainties Remain ...

- New licensing process untested
- New administration, Congress in 2009
- Will escalation of input costs continue?
- No firm capital costs for nuclear (or anything else)
- Commercial terms (e.g., EPC contracts) tough to negotiate
- Large financial commitment for relatively small companies

... But the Uncertainties Are Hedged

- More efficient, predictable licensing process
- Industry has clear understanding of what went wrong the last time
- Unmistakable need for new baseload capacity
- Bipartisan political support
- Strong public support
- Solid support from labor, growing support from environmental community
- Growing concern about carbon emissions

The Bottom Line

- Measured approach to new nuclear plant construction
- New coal-fired capacity faces challenges
 - 28,500 megawatts announced 2006-07
 - 22,300 megawatts canceled
- No new nuclear capacity before 2015-16, and then ramps up slowly
- More gas-fired capacity to fill supply/demand gap
- Continued safe, reliable operation of existing plants, continued profitability