Exelon
Nuclear Partners

Utility Perspective on Future of Water Cooled Reactors

IAEA

Atoms for Peace

Michael Baron-USA

October 29, 2009

Overview

- ✓ Existing US Nuclear Fleet
- ✓ Existing Exelon Nuclear Fleet
- ✓ Nuclear Renaissance - US
- ✓ Licensing Process – US
- ✓ SMART Design/Construction

Existing US Nuclear Fleet

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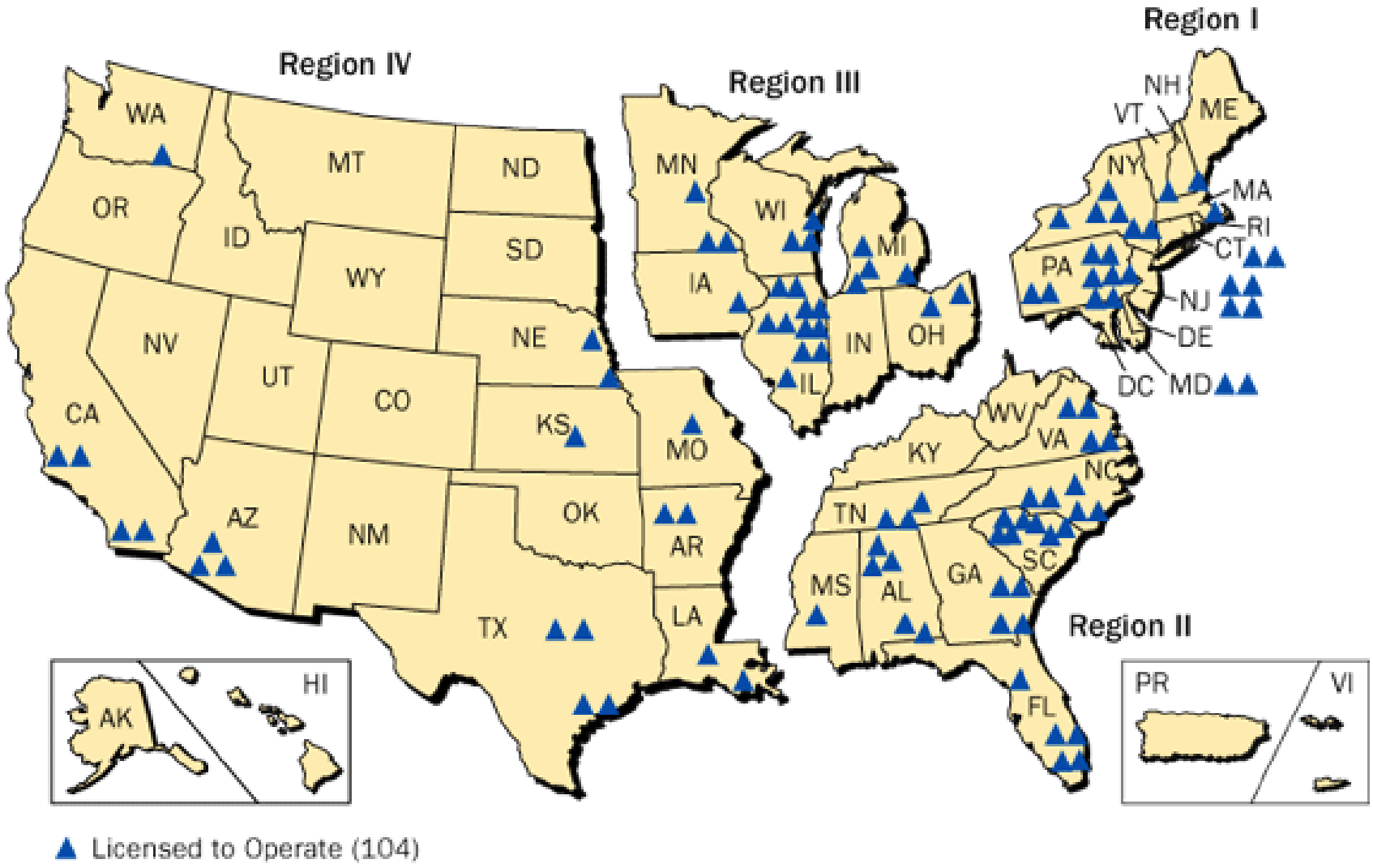
Location of Existing US Nuclear Fleet



US Existing Nuclear Fleet

- ✓ Nuclear energy provides almost 20 percent of the United States' electricity and is its No. 1 source of emission-free electricity.
- ✓ **Percent of worldwide electricity:** 14% or 2,601 billion kilowatt-hours (bkWh) in 2008.
- ✓ **Number of operating reactors:** 104
  - (35 boiling water reactors, 69 pressurized water reactors)
- ✓ 14 BWR plants have one reactor; nine have two reactors; one has three reactors
- ✓ 15 PWR plants have one reactor; 24 have two reactors; two have three reactors
- ✓ **Companies licensed to operate nuclear reactors:** 32
- ✓ **Number of states with operating reactors :** 31
- ✓ **Longest Operating Period Between Refueling:** LaSalle 1 (Illinois); 739 days; February 2006

Existing Fleet Performance Data Analysis

- ✓ Performance benchmarking data parameters (Institute of Nuclear Power Operations (INPO) Index):
  - Industrial Safety Accident Rate (ISAR)
  - Collective Radiation Exposure (CRE)
  - Total Scrams
  - Composite Safety System Performance Unavailability Indicator (SSPI)
  - Capacity Factor
  - Forced Loss Rate (FLR)
  - Refueling Outage Duration
  - Refueling Outage Cost
  - Production Cost ($/MWh)
  - Total Generating Cost ($/MWh)
  - Total Staffing

Existing Fleet Performance Data Analysis

✓Industry Indicators:

- INPO Index trending upward for the past 10 years
- FLR dropped from 3.4% in 1998 to 1.3% through 1Q07
- Since 1998, BWR and PWR Collective Radiation Exposure (CRE) decreased by about 30%
- Industrial Safety Accident Rate (ISAR) has steadily improved
- Automatic scrams remained relative unchanged
- Fuel reliability trending negatively

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Existing Exelon Nuclear Fleet

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Exelon - Background

- ✓ One of the largest electric utilities in the U.S.
  - Distributes
    - Electricity to approximately 5.2 million customers primarily in Illinois and Pennsylvania
    - Gas to 480,000 customers primarily in the Philadelphia area
- ✓ Generation subsidiary
  - One of the largest electricity generation portfolios in the U.S., with a nationwide reach and strong positions in the Midwest and Mid-Atlantic
    - Operates the largest nuclear fleet in the U.S.
      - Third largest commercial nuclear fleet in the world
        - 17 nuclear generating units – Industry performance leader

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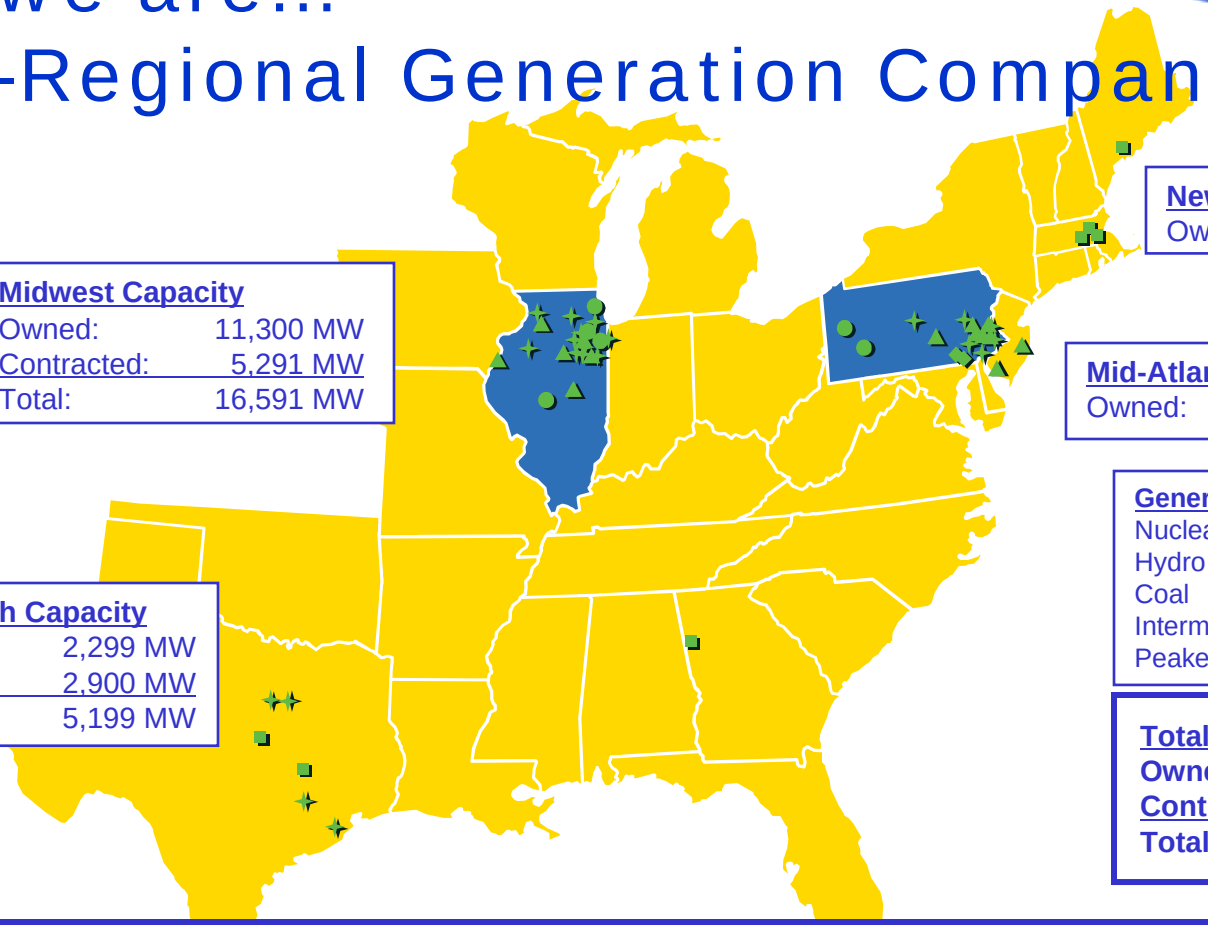
Who we are…
Multi-Regional Generation Company



New England Capacity
Owned: 542 MW

Midwest Capacity
Owned: 11,300 MW
Contracted: 5,291 MW
Total: 16,591 MW

Mid-Atlantic Capacity
Owned: 10,958 MW

ERCOT/South Capacity
Owned: 2,299 MW
Contracted: 2,900 MW
Total: 5,199 MW

Generating Plants	%MW
Nuclear	50
Hydro	5
Coal	9
Intermediate	7
Peaker	29

Total Capacity
Owned: 25,099 MW
Contracted: 8,191 MW
Total: 33,290 MW

17 nuclear units at 10 sites in 3 states
16,856 MW capacity owned – the largest nuclear fleet in the US;
3rd largest nuclear fleet worldwide

Exelon Nuclear Fleet Overview

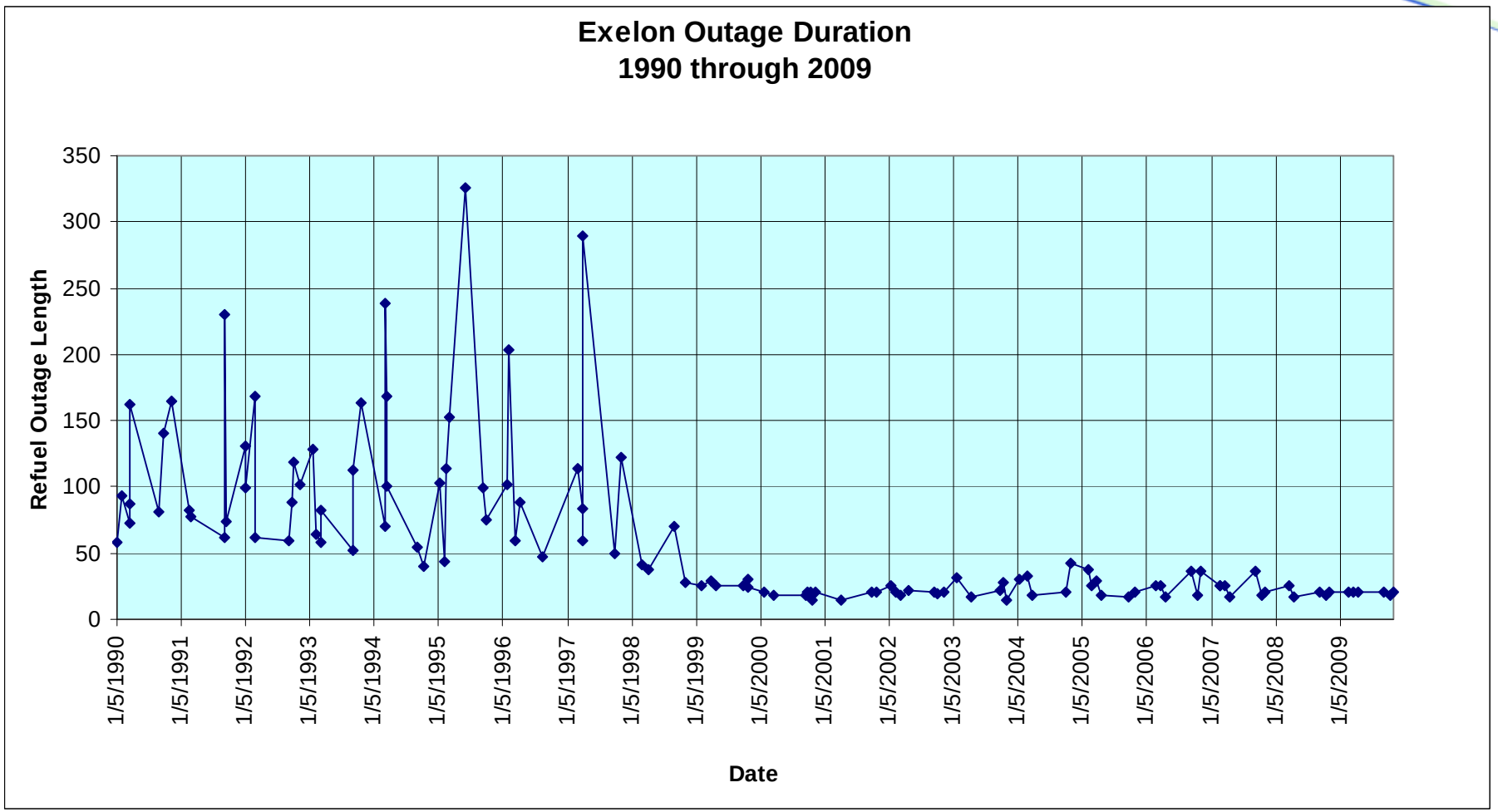
Plant, Location	Units	Type	Vendor	Net Annual Mean Rating MW 2008	License Expiration / Status	Ownership
Braidwood, IL	2	PWR	W	1178, 1152	2026, 2027	100%
Byron, IL	2	PWR	W	1164, 1136	2024, 2026	100%
Clinton, IL	1	BWR	GE	1043	2026	100%
Dresden, IL	2	BWR	GE	867, 867	Renewed: 2029, 2031	100%
LaSalle, IL	2	BWR	GE	1118, 1120	2022, 2023	100%
Limerick, PA	2	BWR	GE	1134, 1134	2024, 2029	100%
Oyster Creek, NJ	1	BWR	GE	619	2009; renewal filed 2005	100%
Peach Bottom, PA	2	BWR	GE	1112, 1112	Renewed: 2033, 2034	50% Exelon, 50% PSEG
Quad Cities, IL	2	BWR	GE	867, 867	Renewed: 2032	75% Exelon, 25% Mid-American Holdings
TMI-1, PA	1	PWR	B&W	786	2014; renewal filed 2008	100%
Salem, NJ	2	PWR	W	1174, 1130	2016, 2020	42.6% Exelon, 56.4 % PSEG

World Class Nuclear Operations – General

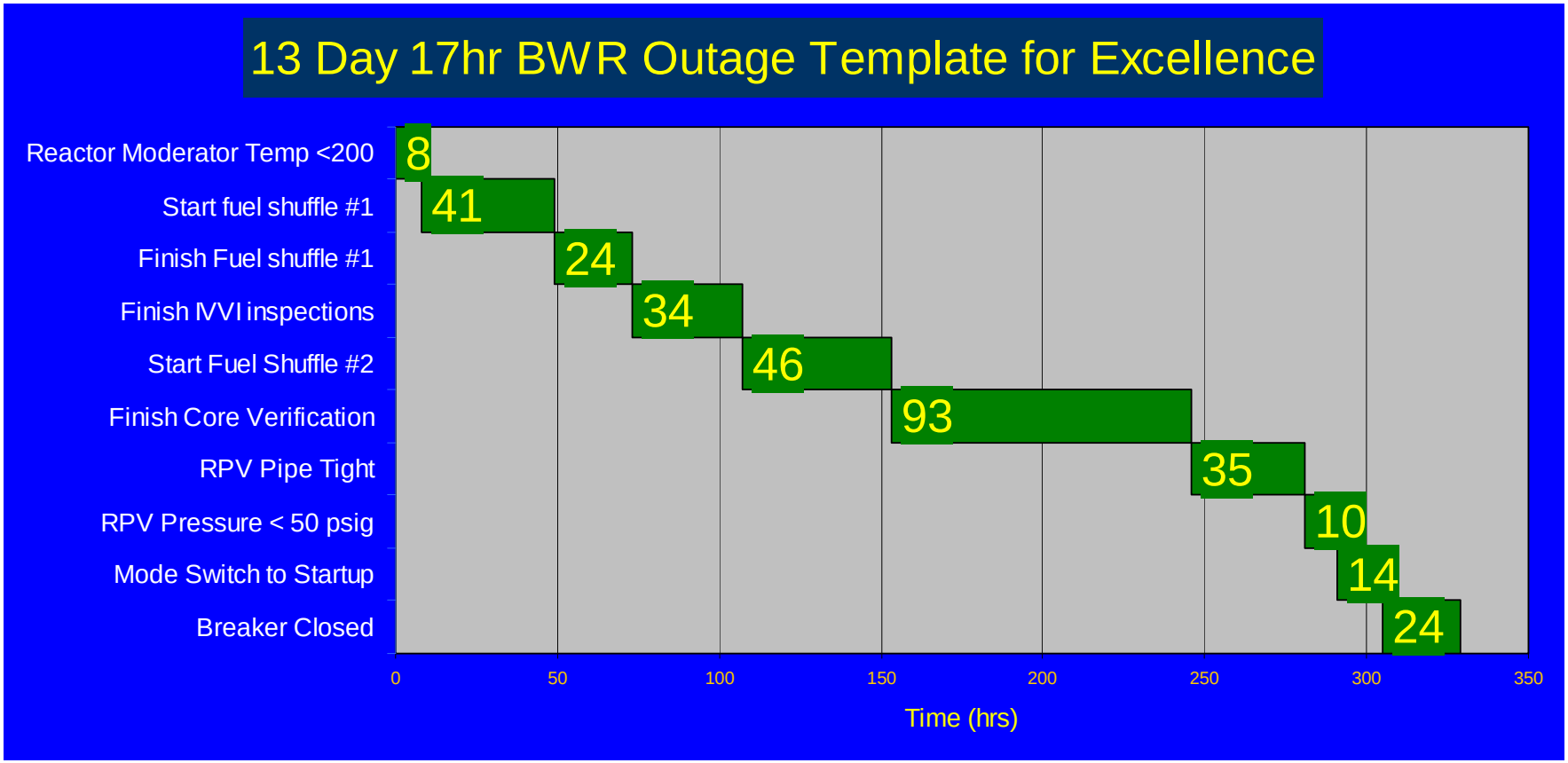
✓ Premier U.S. nuclear fleet

- Best fleet capacity factor ~ 94%
- Lowest fleet production costs ~ $15/MWh
- Fleet average refueling outage durations (17-24 days)
- Strong reputation for performance

Exelon Outage Optimization



World Class Nuclear Operations – Refueling Outage Duration (Cont'd)

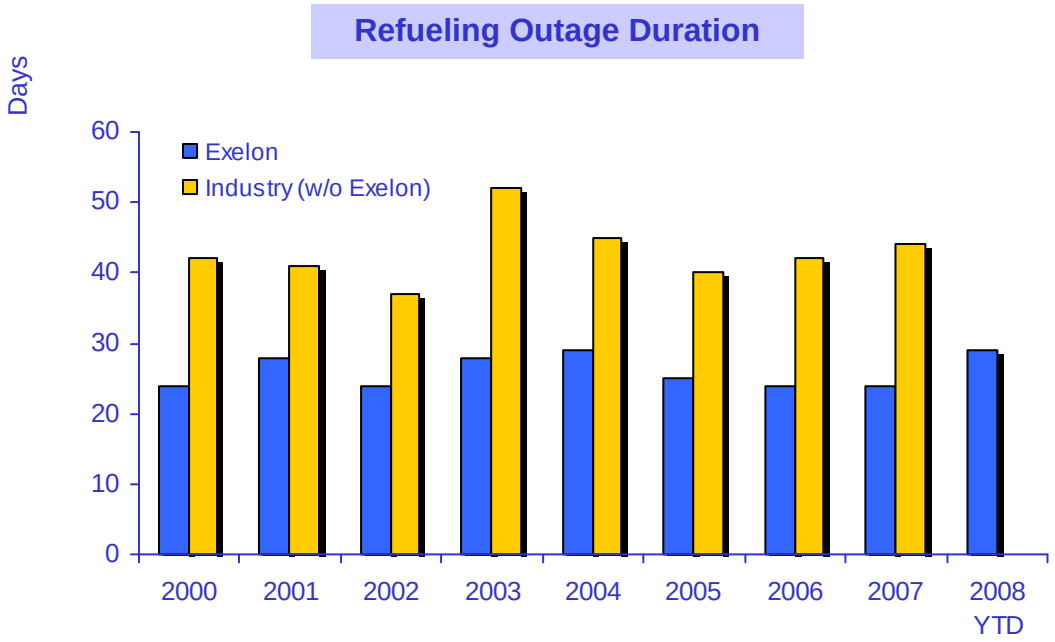


World Class Nuclear Operations

✓ Summer 2008 Performance

• Fleet capacity factor	98.6%
• Clinton capacity factor	100%
• Quad Cities capacity factor	99.7%
• Byron capacity factor	99.5%
• Dresden capacity factor	99.5%
• Braidwood capacity factor	98.8%
• TMI capacity factor	98.6%
• LaSalle capacity factor	98.3%
• Limerick capacity factor	98.1%
• Oyster Creek capacity factor	96.1%
• Peach Bottom capacity factor	95.5%

Impact of Refueling Outages



Nuclear Refueling Cycle

- 18 or 24 months
- Outage duration: ~17-24 days on an average

2008 Refueling Outage Impact

- 2008 reflects Salem's extended steam generator replacement outage
- 2008 YTD average outage duration is 24 days without Salem

2009 Refueling Outage Impact

- Reflects extended steam generator replacement outage
- Based on the refueling cycle, we will conduct 10 refueling outages in 2009, versus 12 in 2008

Exelon Nuclear Management Model©

- ✓ Comprehensive framework for consistent execution of all we do
  - Clearly states our vision, beliefs, strategic focus areas, and key business elements all in one place
  - Drives real performance improvement via an actionable business planning process
  - Illustrates the interdependence of all aspects of our business
- ✓ Playbook for driving standardization
  - Gets everyone on the same page
  - Defines the “One way, best way” to run the business
  - Aligns the corporation and stations eliminating localized differences
  - Facilitates integration of future acquisitions
- ✓ Performance assessment and continuous improvement tool
  - Establishes processes for continuous assessment and improvement
  - Documents progress and change

Nuclear Renaissance- US

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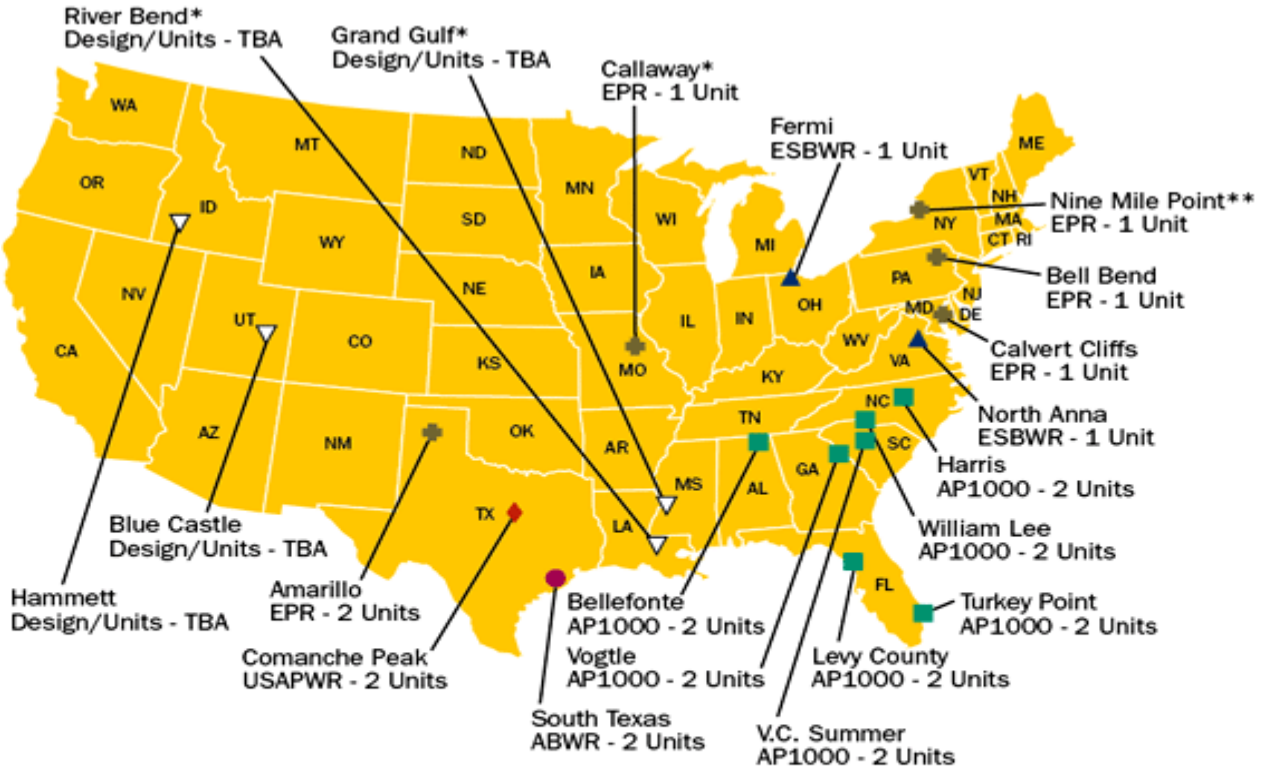
Location of Projected New Nuclear Power



*Review Suspended

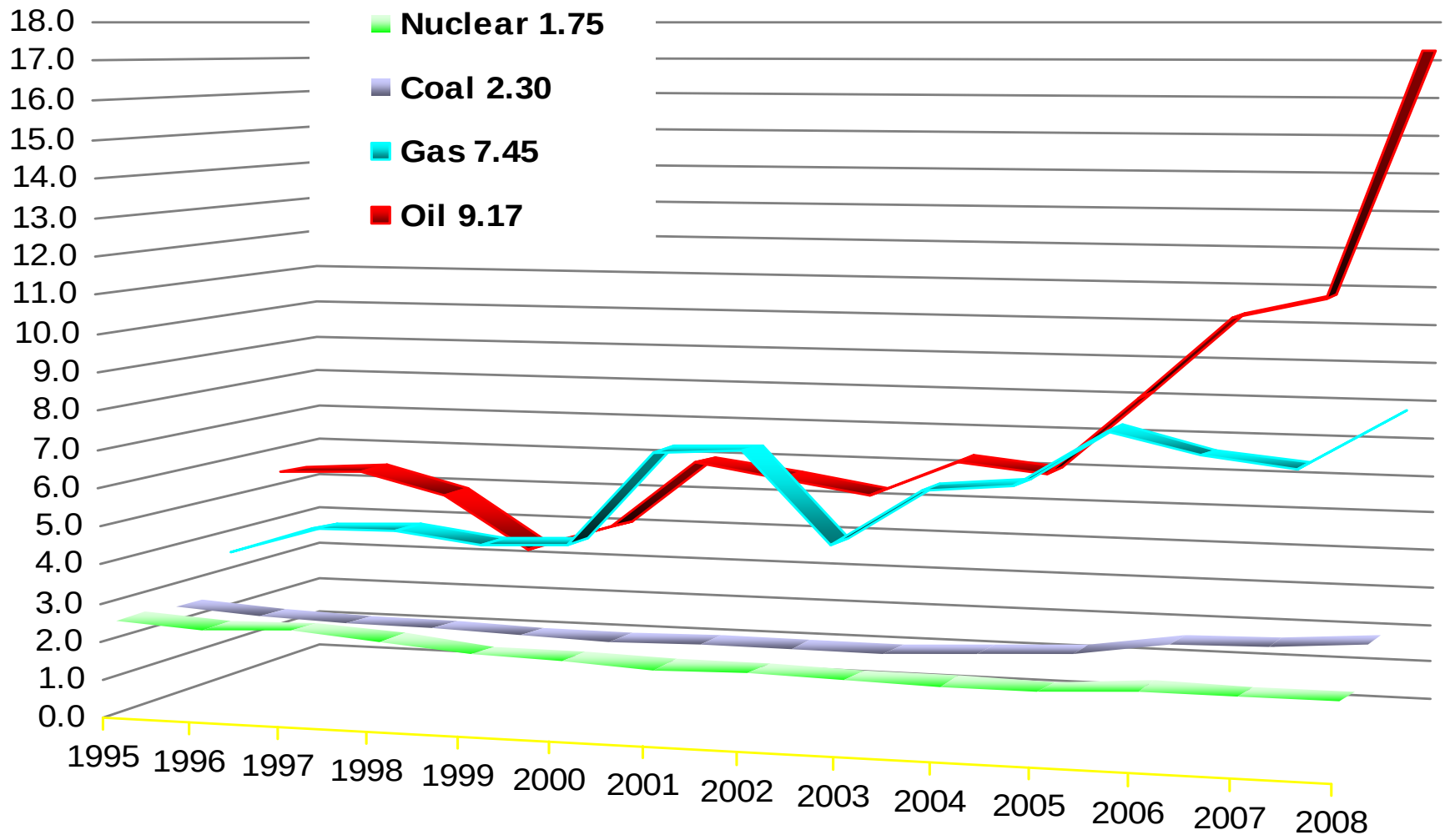
**Review Partially Suspended

Industry New Build Status

- ✓ Several US utilities are aggressively exploring new build opportunities:
  - Exelon
  - NuStart/Southern
  - UniStar
  - NRG
  - Dominion
  - Progress
  - PSEG,
  - Duke,
  - Entergy
  - Southern California Edison

U.S. Electricity Production Costs

(in 2005 cents/kWh)



Source: NEI

What's Driving the Nuclear Market?

The case for new nuclear is compelling

- ✓ Carbon constraints and climate change
- ✓ Security of fuel supply
- ✓ Stability of fuel price
- ✓ Reliability of generation
- ✓ Cost competitiveness of energy supply
- ✓ Proven performance of the current fleet

Exelon criteria for new build:

- ✓ viable design,
- ✓ sound economics,
- ✓ regulatory stability,
- ✓ state and local support
- ✓ path to spent fuel resolution

Nuclear Renaissance

Issues and uncertainties need to be addressed:

- Nuclear proliferation & plant security
- Spent fuel storage
- Workforce availability and qualifications
- Manufacturing infrastructure
- Public opinion
- Regulatory processes

Nuclear Renaissance

Critical Performance Indicators:

- ✓ Project Execution
  - Ability to finance the investment
  - Ability to design and construct the plan
  - Ability to equip the new plant with the right methods, qualified staff, operability and standards
  - Optimized design and standardization
- ✓ Confidence in performance
  - The confidence of the public, the investor, the regulator in sustainable safety and excellence
  - The ability to operate as promised and expected

New Build Optimization

- ✓ Enhanced design calculations
- ✓ Technical specification outlining the design requirements, margins, lessons learned, etc…
- ✓ State of the art refueling outage equipment and process
- ✓ Advanced tooling including robotics
- ✓ Advanced resource management
- ✓ Advanced best practice

360° Work Platform

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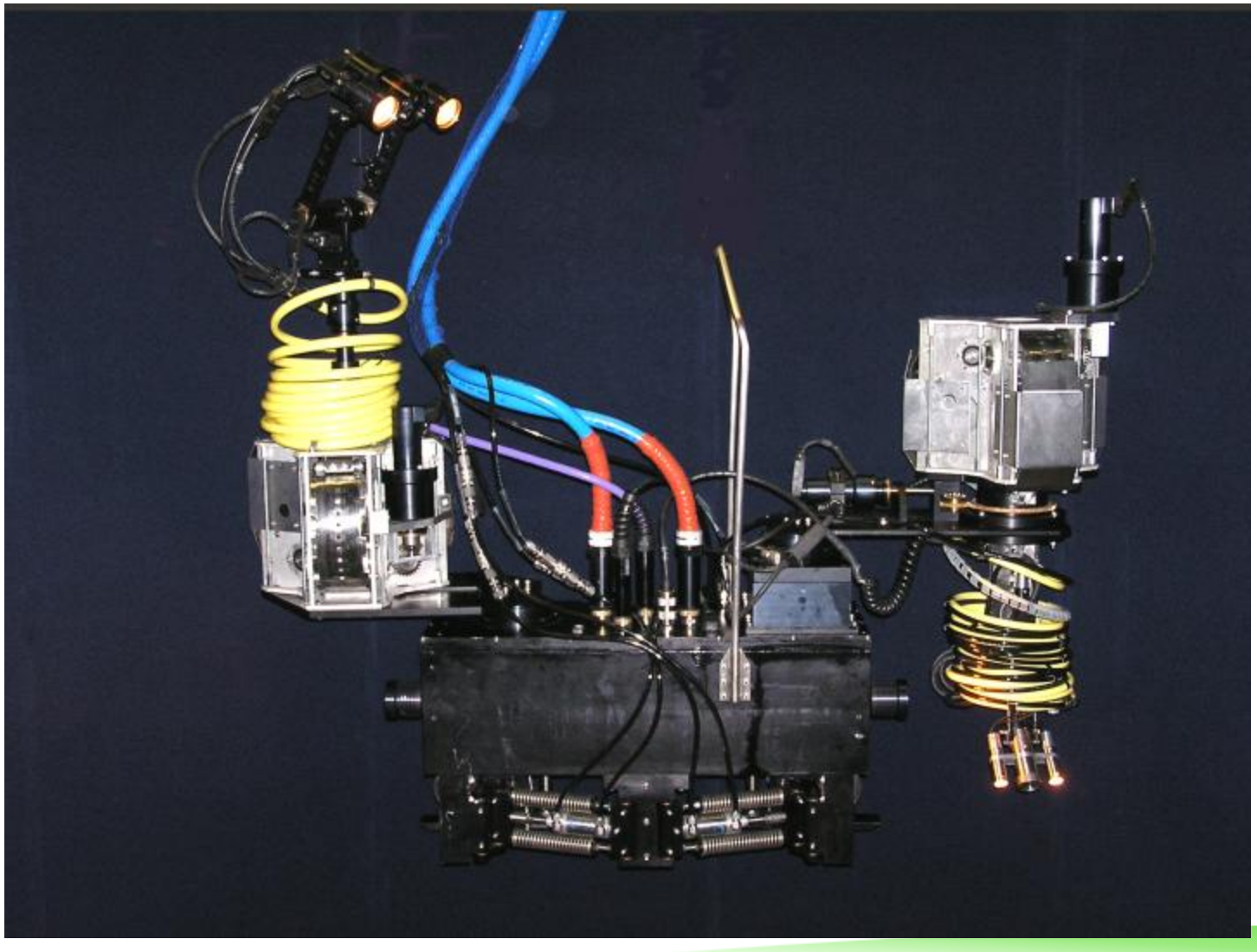
Inspection Robotics



Licensing Process- US

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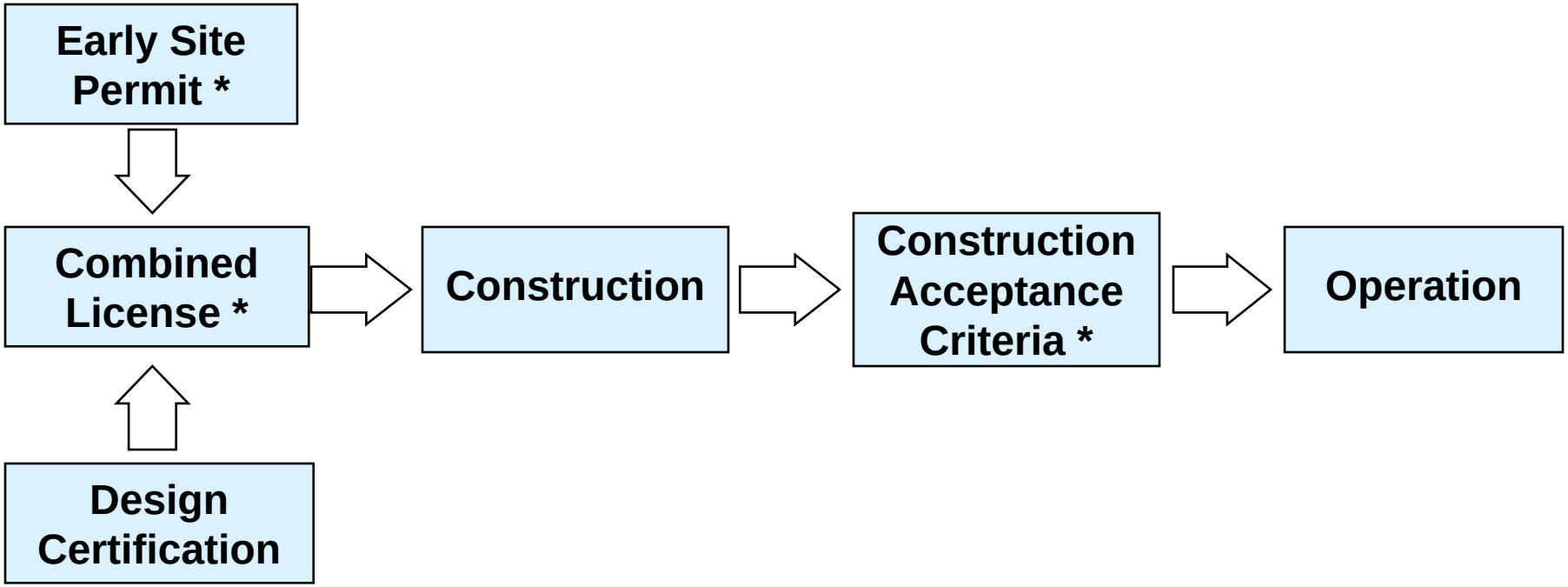
New Nuclear Licensing Process-US

- ✓ Licensing Approach (10 CFR 52)
  - Early Site Permit (ESP)
    - Approval to secure one or more sites for future use
  - Combined Construction and Operating License (COL)
    - Approval to construct and operate a nuclear plant
- ✓ More information available to the public earlier
- ✓ Safety issues are resolved prior to construction

New NRC Licensing Process

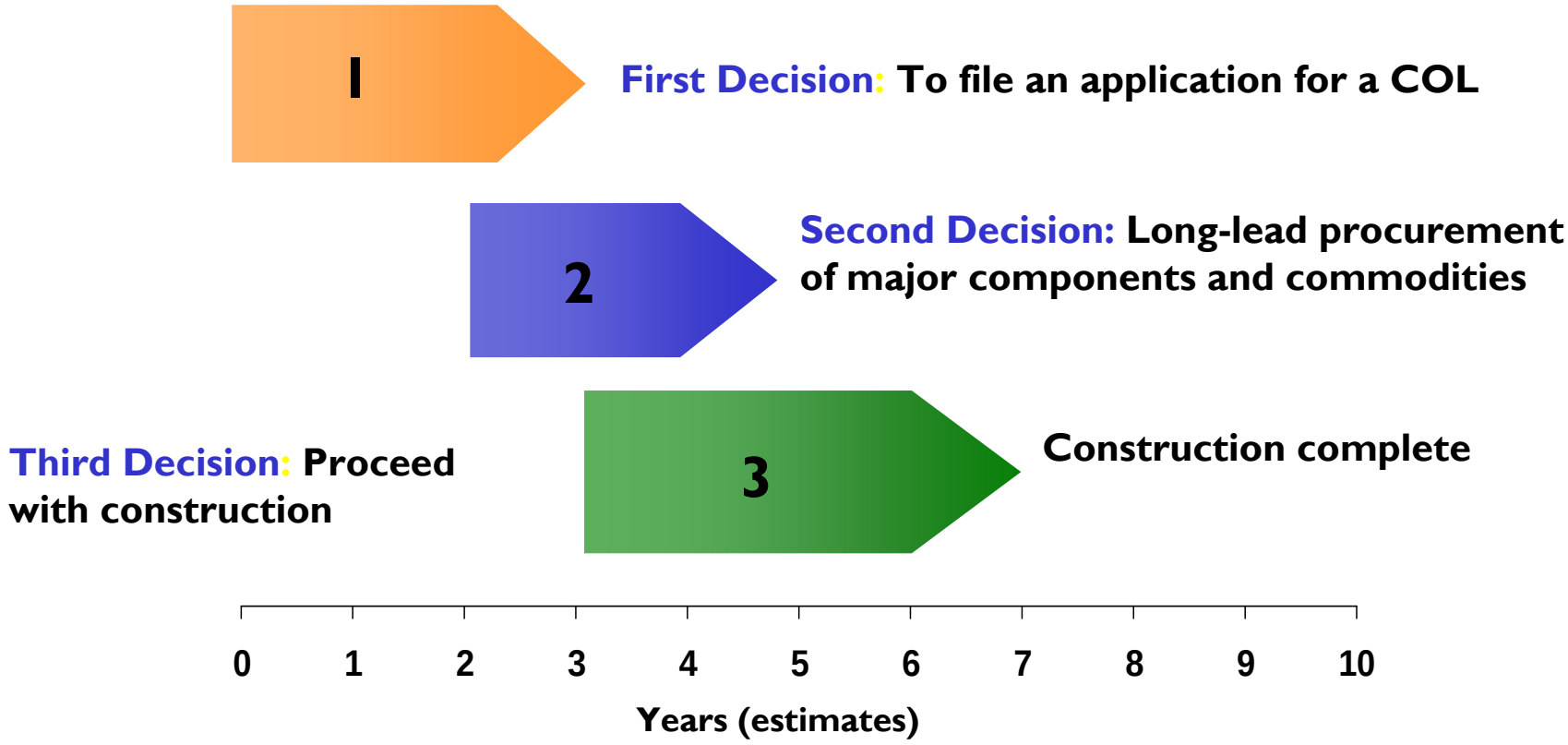
(1992 Energy Policy Act)



*Public Comment Opportunity

Roadmap to Commercial Operation

Building a new nuclear plant is a sequence of three successive decisions:



SMART/Design Construction of New Build

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Smart Construction

- ✓ CAD Models
- ✓ GPS
- ✓ Video
- ✓ Radio
- ✓ Virtual Briefings
- ✓ Teams and Critical Path shifts
- ✓ State of the art equipment

Equipment Tracking

- ✓ GPS tracking modules off-site
- ✓ GPS tracking on-site
- ✓ Equipment tracking
- ✓ Site communications
- ✓ Tracking personnel on-site
- ✓ On-site material
- ✓ Schedule
- ✓ Contingencies

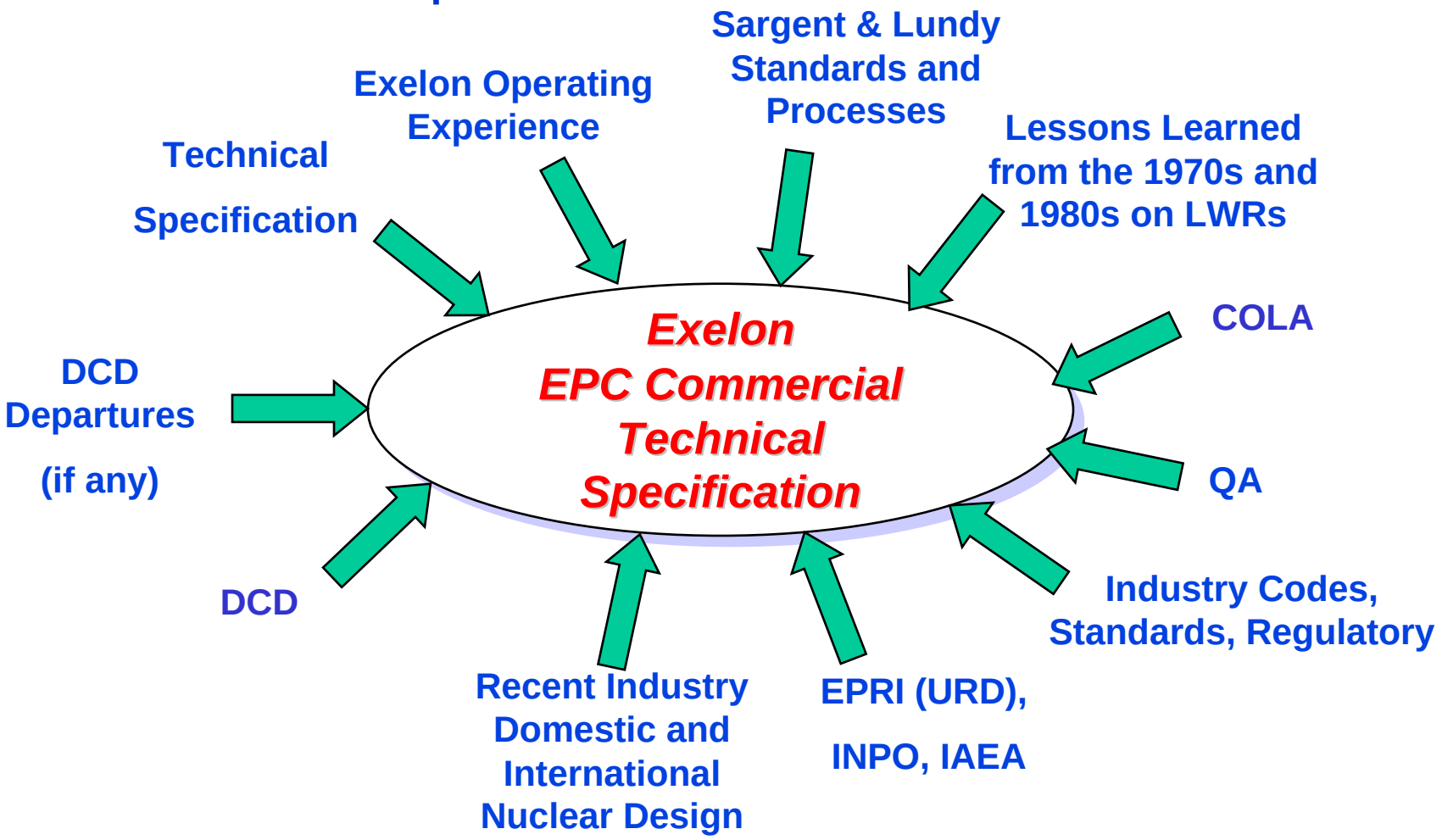
Modularization

- ✓ Numbers, sizes, & weights
- ✓ Design of on-site modular construction yard
- ✓ Building for on-site modular construction
- ✓ Transportation of modules, barges/trucks
- ✓ Unloading modules at barge facility
- ✓ Schedule
- ✓ Contingencies

EPC Specification Technical Requirements Overview

- ✓ Recommendation = Issue Commercial Technical Specification that delivers a State of the Art Plant
  - Emphasis on nuclear industry Lessons Learned and operational experience to date
  - Emphasis on performance
  - Augment the Certified Design (DCD)
  - Specify critical design including margins and procurement requirements

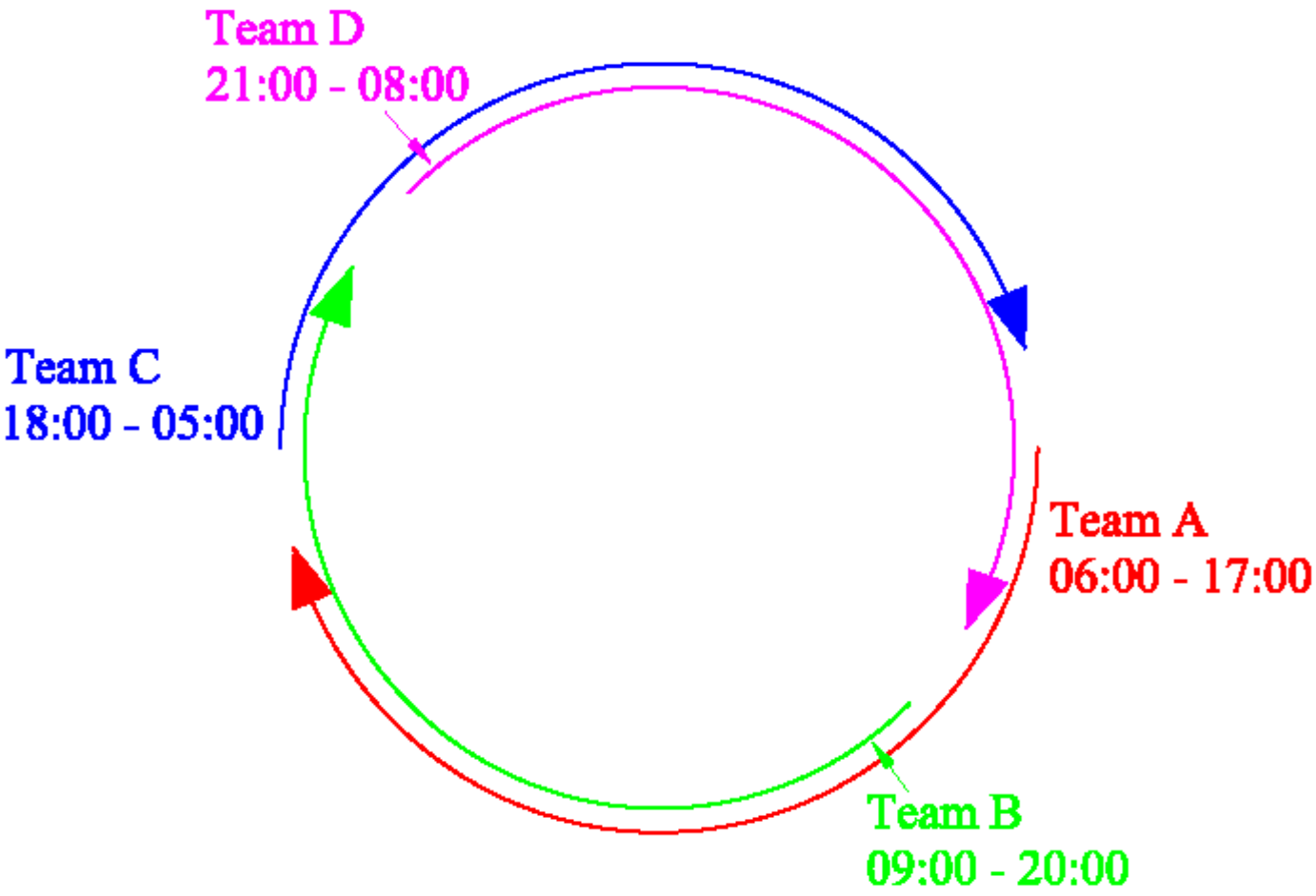
Inputs to EPC Technical Specification



Construction Optimization (Cont'd)

- ✓ Construction schedule
  - Around the clock critical path/near critical path to optimize the schedule
    - Critical path
    - Near critical path
    - Preparatory path
  - Parallel activities and resource management
    - Parallel paths with manpower and equipment
    - Use the largest of the large equipment to optimize tasks
- ✓ Construction control – overall site integration into smart construction
- ✓ Contingency planning
- ✓ Progress reporting plan
  - Multi level task plan feeding back to overall schedule

Construction Optimization



Construction Optimization (Cont'd)

- ✓ Modularization integration
  - Integrate with the procurement process and construction phases
  - QC oversight throughout the modularization process
- ✓ Heavy lift crane plan collaboration
  - Optimization of crane logistics considering parallel activity and security attributes
  - Transition of crane plan from construction phase to operation phase
- ✓ Construction labor / manpower plan
  - Optimize resources
  - Housing plan
- ✓ Craft qualifications and certification tracking
  - Craft and qualifications matrix

Construction Optimization (Cont'd)

- ✓ Constructability reviews plan
  - Project Team
  - 3-D modeling interference assessments
- ✓ Overall site safety, environmental, and health plan
  - NEI 0606 Fitness for Duty, 29 CFR 1910, and 29 CFR 1926
  - Personal Protection Equipment (PPE), various aspects of safety
- ✓ Site Crisis management plan
  - Emergencies, evacuation
- ✓ Existing industrial/environmental/archeological obstructions
- ✓ Waste disposal plan
  - Construction waste disposal plan – landfill in area
- ✓ Construction work packages
  - Blocks of man-hours, electronic tracking

Construction Optimization (Cont'd)

- ✓ DOR
- ✓ Construction Temp Power
- ✓ Warehousing Plan
  - Parts and materials stored onsite – harsh environment
- ✓ Procurement Plan
  - Tied directly with scheduling (feed and bleed, recommendation – 6 months)
- ✓ 3-D Model
  - Pre job briefs with crews
  - Constructability and rigging
  - Safety

“Construction Command Center”

Conclusion:

- ✓ *Established Utilities*
- ✓ *New Programs*

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THANK YOU