DELIVERING THE NUCLEAR PROMISE

nuclear matters: my work • my plant • my industry

Delivering the Nuclear Promise: Advancing Safety, Reliability and Economic Performance & Radiation Protection

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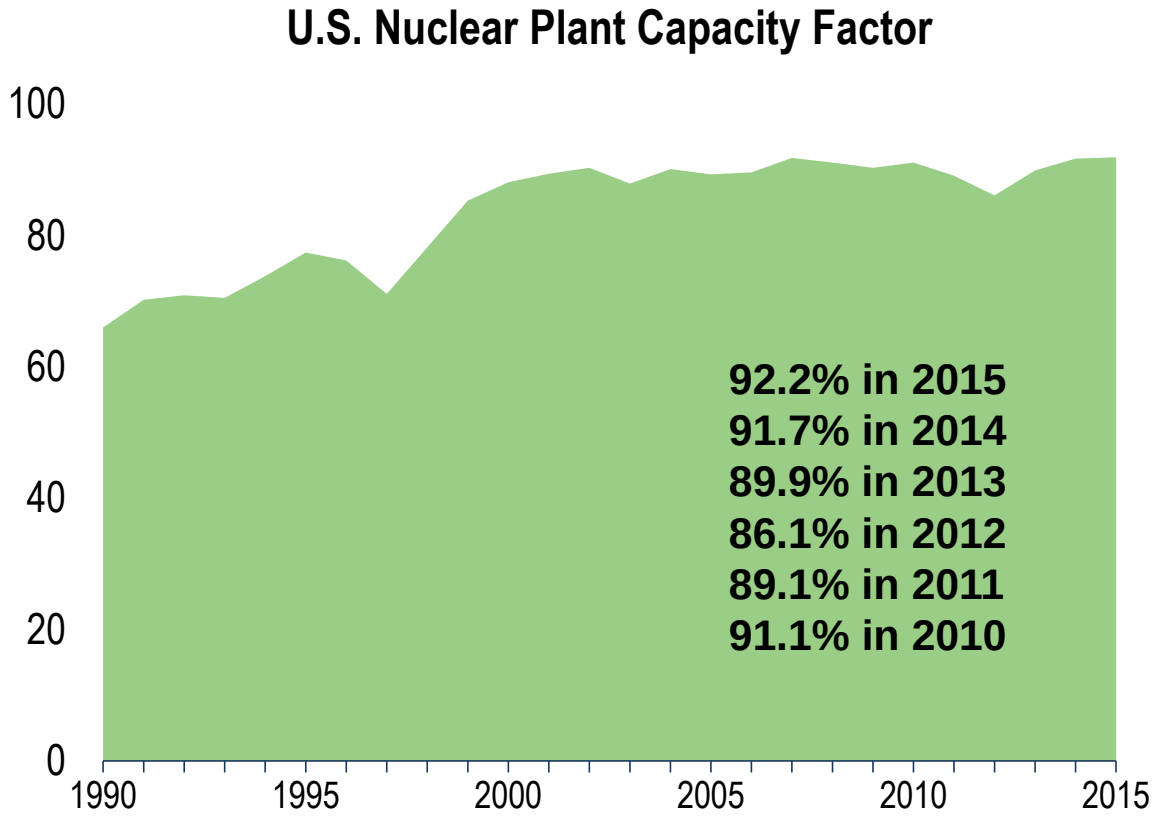
Record Capacity Factor in 2015

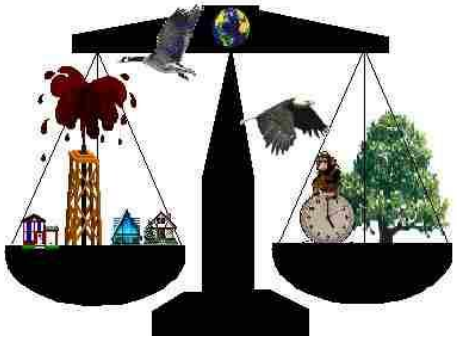
U.S. reactors set record 92% capacity factor, generated 798 billion kilowatt-hours of electricity.



Source: Energy Information Administration

Nuclear Energy's Economic Challenges

- Electricity demand is flat; marginal growth
- Sustained low-cost natural gas
- Subsidized wind
- Flawed electricity markets
- Heavy regulatory burden
- Heavy self-imposed & industry burdens



Outlook

- Several U.S. nuclear plants have shut down, or will soon
- Generating costs at U.S. nuclear plants have increased 28% during the last decade
- “Business as usual” approach will not successfully address the challenges of rising costs and inadequate revenue
- It is not a merchant plant* issue – it’s an industry issue

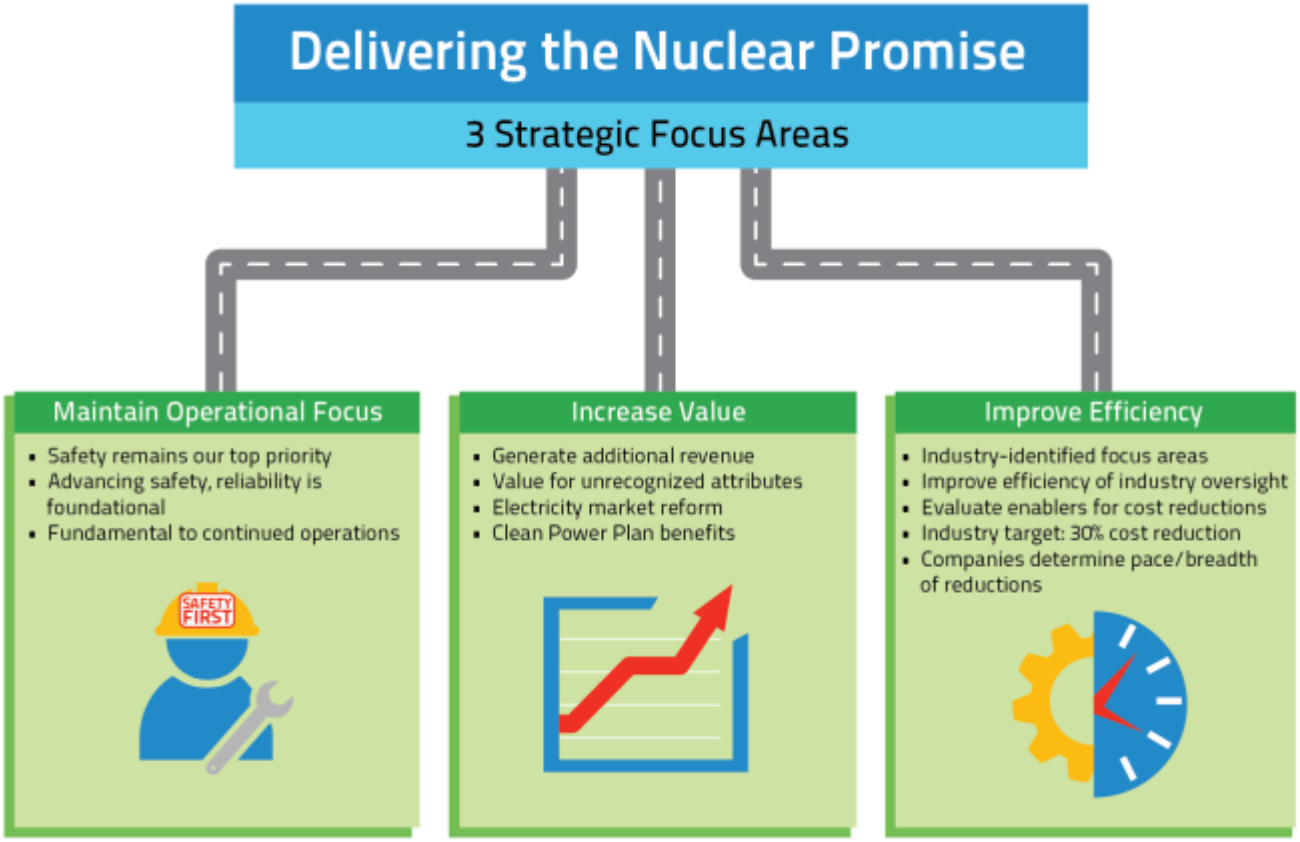
*Merchant plants are funded by investors & sell electricity in a competitive wholesale market. Consumers are not obligated to pay for construction, operations or maintenance of the plant.

Decommissioning Status as of July 2016

- Currently 100 operating reactors at 61 sites
- 10 power reactors completed decommissioning
  - Between 1995 and 2009
- 18 power reactors currently undergoing decommissioning
  - 13 in SAFSTOR
    - Including Crystal River 3, Kewaunee, & Vermont Yankee
  - 5 in Active DECON
    - Humboldt Bay, Zion 1&2, and SONGS 2&3
- 5 power reactors shut down since 2013
  - Crystal River 3, Kewaunee, & Vermont Yankee, and SONGS 2&3

- 7 announced near-term shutdown
  - Fort Calhoun- end of 2016
  - Fitzpatrick - early 2017
  - Clinton - June 1, 2017
  - Quad Cities - June 1, 2018
  - Pilgrim by June 1, 2019
  - Oyster Creek - December, 2019
  - Diablo Canyon – 2024 & 2025

Rising to the Challenge: Delivering the Nuclear Promise



Three Strategic Focus Areas

- **Maintain Operational Focus**—Continue to enhance already high levels of safety and reliability
- **Increase Value**—Educate and drive awareness of the value of nuclear energy, particularly the economic and environmental benefits
- **Improve Efficiency**—Identify opportunities and redesign fundamental plant processes to improve efficiency and effectiveness

Four Building Block Teams

Building Block 1: Analysis and Monitoring

Objective: Analyze plant cost drivers and identify opportunities to improve efficiency.

Building Block 2: Value Recognition

Objective: Leverage federal and state policies to ensure greater recognition of nuclear energy's value.

Building Block 3: Process and Program Redesign

Objective: Re-design nuclear plant processes to improve efficiency while a fundamentals of safe, reliable operation.

Building Block 4: Strategic Communications

Objective: Implement a communications strategy to ensure industry engagement.

Outreach to Key Stakeholders

Industry is continuing outreach to key stakeholders:

Labor Unions

Suppliers

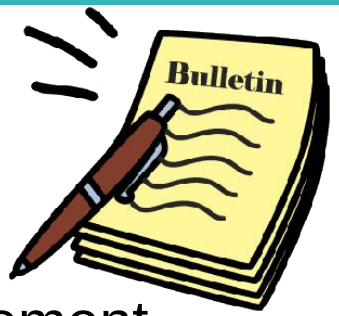
U.S. NRC

Utility/Plant Employees

13 Teams and CNO Leads

- Corrective Action Program: Danny Bost, Southern Nuclear
- Engineering: Tim Rausch, Talen
- Preventive Maintenance Program Scope: Neil Wilmshurst, EPRI
- **Radiation Protection: Fadi Diya, Ameren Missouri**
- Regulatory Efficiency: Mano Nazar, NextEra Energy
- Security: Bryan Hanson, Exelon
- Training: Randy Edington, APS
- Transform the Organization: Tim O'Connor, Xcel Energy
- Work Management: Dennis Koehl, STP
- Supply Chain Efficiency: Adam Heflin, Wolf Creek Operating Corp.
- Oversight and Assessment: Mano Nazar, NextEra Energy
- In-Processing: Bill Pitesa, Duke Energy
- Finance - Review IO Savings Estimates: David Heacock, Dominion

How Do We Communicate Efficiencies?



- Efficiency Bulletins!
  - Mechanism for communicating efficiency improvement initiatives to industry
  - Are being distributed to nuclear plant operators to clearly identify, characterize and standardize improvement opportunities
  - Implementation has begun. In most cases, the pace and scope of implementation will be determined by each company

Efficiency Bulletins

- Include background, summary description, relevant standards, guidance reference, recommended actions, change management
- Color coded for accountability/ implementation
  - All must do (red), all should do (blue), company discretion (green)

What Have We Accomplished So Far?

- The industry has issued 21 efficiency bulletins to date in 2016
- 18 more efficiency bulletins scheduled for completion this year
- The program will run through 2018 and will be institutionalized

http://www.nei.org/Issues-Policy/Delivering-the-Nuclear-Promise

Efficiency Bulletins Published To Date

- 16-01: Eliminate Administrative Changes to Preventive Maintenance Work Orders
- 16-02: Implement Graded Approach to Walkdowns
- **16-03: Align Personnel Contamination Event Response to Industry Guidance**
- **16-04: Source Checking Personnel and Tool Contamination Monitors**
- 16-05: Non-Licensed Operator/Maintenance and Technical Continuing Training
- 16-06: Implementing a Standardized Search and Seal Process
- 16-07: Training Task List Reviews
- 16-08: Eliminate Formal Margin Management Programs
- 16-09: Security Shift Brief and Turnover
- 16-10: Reduce Cumulative Impact from the Corrective Action Program
- 16-11: Training Cumulative Impact Strategies
- **16-12: Graded Approach to Long-Term Dose Reduction Plan**
- **16-13: Perform Self-Briefs for Low Radiological Risk Activities**
- 16-14: Training Cumulative Impact Strategies (Part 2)
- 16-15a: Work Screening Process
- 16-15b: Utilizing Minor Maintenance
- 16-15c: FIN Team Efficiency
- 16-16: High-Cost Non-Critical PM Reduction

Continued on next slide…

Efficiency Bulletins Published To Date - continued

- 16-17: Optimizing FLEX Equipment PM Strategies
- 16-18: NLO/Maintenance and Technical Initial Training Content
- 16-19: Contract Forensics

What's Next?

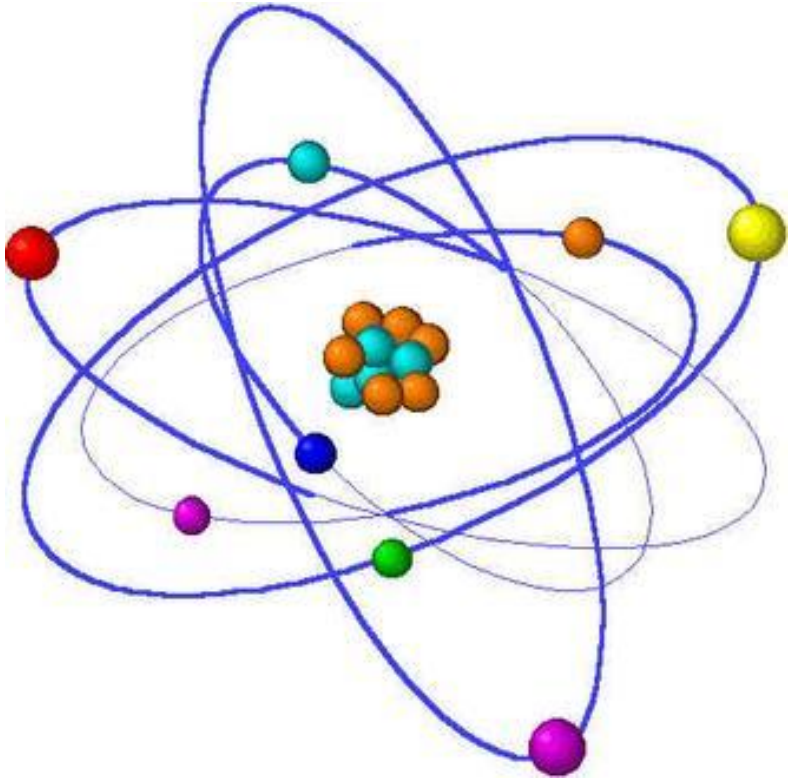
- Future efficiency bulletins will enable more savings
  - Dozens of efficiency bulletins are expected to be issued in the next two years
  - Improving efficiency must become part of the culture of the nuclear industry
  - We must constantly maintain safety, ensure reliability and look for opportunities to enhance efficiency

What Role Are Employees Playing?

- Remaining focused on safety
- Sharing their expertise

- Challenging one another to continually improve
- Putting forward and sharing pioneering ideas
- Thinking outside the box

Radiation Protection



DNP RP Team

Fadi Diya

- Betsy Langille, TVA
- David Thompson, Duke
- Doug Noble, FENOC
- Harry Bush, Exelon
- Kevin DeGraw, Ameren
- Johann Geyer, Ameren
- Mark Rigsby, Duke
- Mike Skiles, WCNOC
- Willie Harris, Exelon
- Liette Lemieux, OPG
- Kevin Pushee, INPO
- Paul McNulty, INPO
- Ellen Anderson, NEI
- Jim Kost, Mirion
- Jimmy Orr, BHI Energy
- John Rayment, IBEW
- Jeffrey Hughes, Boilermakers
- Cecile Conroy, Boilermakers
- John Fultz, Boilermakers

Radiation Protection Strategy & Vision for 2018

Strategy: An effective and efficient radiation protection organization that maintains and promotes radiological safety.

2018 Vision: Radiological protection program that is transitioned to a reliance on knowledgeable and accountable workers and leaders that safely perform low radiological risk work, while efficiently applying common processes and technologies. While the radiation protection program will still exist, the sphere of responsibility is focused on worker and leadership accountability.

End State:

- Common process tools – postings, surveys, RWPs, etc.
- Reduced outage costs for in-processing, training, and qualifying radiation workers and supplemental radiation protection technicians qualifications
- Increase the use of Junior RP technicians in outages
- Reliance on workers to be accountable for their own radiological safety (bounded/limited)
- Reliance on cross functional leadership accountability for radiological protection
- Efficient use of common radiation monitoring tools (dosimetry, instruments, remote monitoring)
- Common radiation protection staffing and responsibilities

Radiation Protection EBs Published to Date

- 16-03: Align Personnel Contamination Event Response to Industry Guidance
- 16-04: Source Checking Personnel and Tool Contamination Monitors

- https://www.youtube.com/watch?v=gQ4yFOS4GEc&index=2&list=PLCQG6xi8sYelZ-TFwr6jQkNwFSlQ4TKJE

Radiation Protection EBs Published to Date

- 16-12: Graded Approach to Long-Term Dose Reduction Plan
- 16-13: Perform Self-Briefs for Low Radiological Risk Activities

Future RP Efficiencies on the Horizon

- RP-22 :NANTEL Radiation Worker Training without plant specifics
- RP-12: Common Supplemental RP Tech Training
- RP-13: Self-Monitoring?
- RP-21 & 15: Reduced Monitored Population & Use of EPD/OSLD as DLR
- RP-8: Reduce Source Check Frequency of Survey Meters

Key Takeaways

- This is a critical industrywide initiative that will make the industry more efficient and effective
- We will not sacrifice safety to reduce costs
- This initiative has three strategic goals: Maintain operational focus, increase value, improve efficiency
- Stakeholder outreach has been extensive with industry employees, labor unions, NRC and suppliers

We are looking for additional efficiencies…

Please email your ideas to me:

exa@nei.org

Questions