

**COMMISSION BRIEFING SLIDES/EXHIBITS**

**BRIEFING ON NRC LESSONS LEARNED:  
DAVIS-BESSE REACTOR VESSEL HEAD DEGRADATION**

**FEBRUARY 4, 2003**

# **Commission Meeting on Lessons Learned:**

## **Davis-Besse Reactor Vessel Head Degradation**

**February 4, 2003**

# **Lessons Learned**

**H. Peter Burg**

**FirstEnergy Chairman and  
Chief Executive Officer**

# **Lessons Learned**

- **Unrelenting, uncompromising commitment to safety**
- **Thorough system of checks and balances**
- **Strong centralized oversight**

# **Lessons Learned**

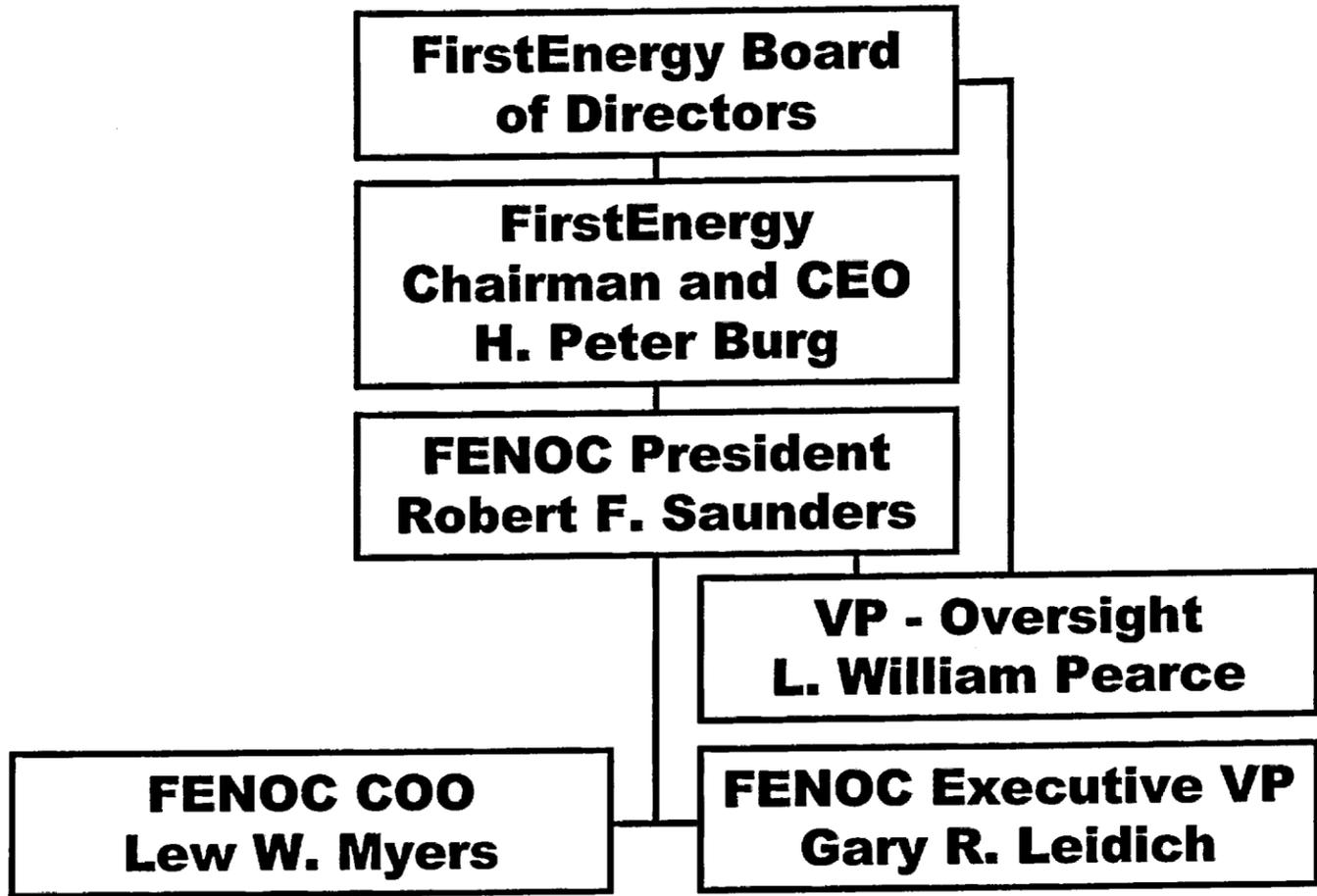
- **Safety is top priority**
- **Recognize the responsibility**
- **Get the job done right the first time**

# **Lessons Learned**

**Robert F. Saunders**

**FirstEnergy Nuclear  
Operating Company**

**President and  
Chief Nuclear Officer**



# **Lessons Learned**

- **Management Root Cause**
  - **Nuclear Safety focus**
  - **Safety Culture**
- **Alignment of incentives**

# **Lessons Learned**

**Gary R. Leidich**

**FENOC Executive Vice President**

# **Lessons Learned**

- **Engineering rigor and ownership**
- **Strengthened principles and expectations**

# **Lessons Learned**

- **Standardized site-level engineering organization**
  - **Clear responsibilities**
  - **Cohesiveness**

# **Lessons Learned**

- **New corporate organization**
  - **Standardization of nuclear corporate directives**
  - **High industry standards**
  - **Assure implementation**
- **Engineering Assessment Board**
  - **Assures quality products**

# **Lessons Learned**

**Lew W. Myers**

**FENOC Chief Operating Officer**

# **Lessons Learned**

- **Improved material condition**
- **Improved management and personnel performance**
- **Improved performance in programs and procedures**

# **Lessons Learned**

- **New Reactor Head installed**
- **System reviews**
- **Increased safety margins**

# **Lessons Learned**

- **Commitment to safety**
- **Strong and technically competent management team**
- **Improved operability determination standards**
- **Safety Culture**

# **Lessons Learned**

- **Strengthened Corrective Action Program**
- **Problem Solving Nuclear Operating Procedure**
- **Revised Boric Acid Program**
- **Operations Improvement Plan**
- **Restart Readiness Review**

# **Lessons Learned**

**L. William Pearce**

**Vice President - Oversight**

# **Lessons Learned**

- **Quality Assurance oversight standards**
- **Rigor of quality oversight products**
- **Company Nuclear Review Board focus on safety**
- **Improved Safety Conscious Work Environment Program**

# **Closing Comments**

**H. Peter Burg**

**FirstEnergy Chairman and  
Chief Executive Officer**

# **Closing Comments**

- **Making solid progress**
- **Will only return plant to service when convinced it will operate safely and reliably**



**Davis-Besse**  
**Oversight Activities**  
**February 4, 2003**

# **Agenda**

- **Problem Discovery and NRC Immediate Actions**
- **NRC's Davis-Besse Oversight Panel Charter**
- **NRC's Davis-Besse Restart Checklist**

# **Agenda**

- **Inspection Findings and Status**
- **Licensing Action Status**
- **Public Access and Stakeholder Involvement**
- **Conclusions**

# **Problem Discovery and NRC Immediate Actions**

- **Reactor Pressure Vessel Head Cavity Discovered March 6<sup>th</sup>**
- **Confirmatory Action Letter Issued March 13<sup>th</sup>**
- **Augmented Inspection Team Public Exit Conducted April 5<sup>th</sup>**

# **Problem Discovery and NRC Immediate Actions**

- **Augmented Inspection Team Results Discussed at Agency Action Review Meeting April 9<sup>th</sup>**
- **NRC Decided to Establish a Davis-Besse Oversight Panel pursuant to MC 0350 April 29<sup>th</sup>**

# **NRC's Davis-Besse Oversight Panel Charter**

- **NRC's MC 0350 Oversight Panel chartered May 3<sup>rd</sup>**
- **Panel membership includes executives, managers, and staff from Region III and NRR**
- **Panel charter defines goals and responsibilities**
  - **Establish and update Restart Checklist, Process Plan and Communications Plan**

# **NRC's Davis-Besse Oversight Panel Charter**

- Define scope of and coordinate NRC activities**
- Maintain ongoing assessment during shutdown and through restart**
- Ensure effective communication with internal and external stakeholders**
- Maintain complete and scrutable record of NRC activities**

# **NRC's Davis-Besse Restart Checklist**

- **Restart Checklist Includes Those Issues Necessary to Address Before Consideration of Facility Restart**
  - **Adequacy of root cause evaluations and corrective actions**
  - **Adequacy of systems, programs, organizational effectiveness and human performance**
  - **Resolution of licensing issues**

# **NRC's Davis-Besse Restart Checklist**

- **Restart Checklist Revised to add Sump Modification, Radiation Protection Program and Information Accuracy**

February 4, 2003

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# **Inspection Findings and Status**

- **Early NRC inspection findings resulted in FirstEnergy stopping work**
- **Ongoing inspections indicate earlier findings resolved**
- **Inspections in Restart Checklist areas continuing and tracking licensee progress**

# **Licensing Action Status**

- **Replacement head required  
several ASME code relief requests**
- **All currently identified licensing  
actions have been completed**

# **Public Access and Stakeholder Involvement**

- **NRC has conducted approximately 40 public meetings regarding Davis-Besse**
- **NRC is maintaining a specific web page focused on Davis-Besse**

# **Public Access and Stakeholder Involvement**

- **NRC is utilizing video and audio conferencing and meeting transcription to assure public access to information**
- **NRC has conducted over 20 briefings of federal, state and local officials**
- **NRC considered and denied a 10 CFR 2.206 petition for independent oversight**

# Conclusions

- **FirstEnergy making progress**
- **NRC's Davis-Besse Oversight Panel effectively focusing on safety**

# **Davis-Besse: Near Miss and Missed Opportunity for NRC**

**Paul Gunter, Director  
Reactor Watchdog Project  
Nuclear Information  
and Resource Service**

**Lack of effective NRC oversight and enforcement at Davis-Besse has significantly eroded the public trust in the agency's regulatory decision-making process and unduly risked public safety.**

**Task Force Final Report does not provide an adequate review of regulatory issues such as the abandonment of Regulatory Guide 1.174**

## **RG 1.174 SAFETY PRINCIPLES**

- **If inspections were performed, current regulations are not met**
- **One barrier is likely degraded**
- **Safety margins are likely reduced**
- **Only a small increase in CDF results**
- **Risk measurement monitored only by performance of inspection**

**[NRR assessment to EDO, 11/30/2001]**

**“Although operation in this condition could result in  $\Delta$ CDF and ICDP values that are above the normally accepted guidelines of RG 1.174 and RG 1.182, the analyses also indicate that the consequences of such an event would not constitute undue risk to the health and safety of the public.”**

**[NRC DAILY STATUS REPORT, 11/30/01, FOIA 2002-0229]**

**The report does not adequately address documented financial considerations made by NRC management that prioritized the licensee's production over public safety requirements.**

# **Near miss and Missed opportunity**

**NRC missed opportunity to demonstrate a lesson learned from 1996 when TIME magazine “caught the Nuclear Regulatory Commission at a dangerous game that it has played for years: routinely waiving safety rules to let plants keep costs down and stay online”?**

**[“Blowing the Whistle on Nuclear Safety”, TIME, 03/05/96]**

**Nuclear Information and Resource Service  
1424 16<sup>th</sup> Street NW Suite 404  
Washington, DC 20036**

February 04, 2003

Commissioner Richard Meserve, Chair  
Commissioner Edward McGaffigan, Jr.  
Commissioner Greta Joy Dicus  
Commissioner Nils J. Diaz  
Commissioner Jeffrey Merrifield  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

**[SLIDE 1]**

**Davis-Besse: Near Miss And Missed Opportunity**

**Presentation of Nuclear Information and Resource Service on  
The United States Nuclear Regulatory Commission on the Davis-Besse Vessel Head  
Degradation Lessons Learned Task Force Final Report.**

Thank you. My remarks today are focused on the Task Force evaluation of the agency's scraping of the Order to shut down Davis-Besse for Bulletin 2001-01 safety inspections.

**[SLIDE 2]**

**It is now broadly recognized that a lack of effective NRC oversight and enforcement at Davis-Besse eroded the public trust in the agency's regulatory decision-making process and placed safety at undue risk.**

FirstEnergy's deliberate neglect destroyed the Davis-Besse reactor vessel head and significantly risked a nuclear accident. The recurrent lack of effective NRC oversight further eroded a hole in the public's trust of the agency's commitment to safety.

The agency's Reactor Oversight Process (ROP) erroneously represented that FirstEnergy was maintaining its focus on safety. Plant Assessments conducted by NRC failed to even mention the blizzard of corrosive boron snow driven by Reactor Coolant System leakage inside containment.

While FirstEnergy eventually admitted that placing production over safety requirements had become a routine course of business over a period of years, NRC has yet to admit its role in prioritizing company profit margins over public safety margins.

**[SLIDE 3]**

**Task Force Final Report does not provide an adequate review of regulatory issues such as the abandonment of Regulatory Guide 1.174**

The Final Report fails to address the agency's justification for abandoning its risk analysis technique as outlined in Regulatory Guide 1.174 "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis."

The NRC policy statement on Probabilistic Risk Assessment encourages greater use of this analysis technique in safety decision-making. It provides the staff and the licensee with clearly established governing safety policies and procedures through a set of five principles.

The five principles were applied by NRC staff in September 2001 as the basis for issuing an Order to non-complying licensees to perform inspections of Control Rod Drive Mechanisms nozzles per request of the Bulletin. Staff concluded that four of the five safety principles were not met. And the fifth, a special circumstance existed where current regulations were inadequate.

Using the guidance, staff concluded that Davis-Besse was not safe to operate beyond December 31, 2001 and "determined a potentially hazardous condition may exist, such that the integrity of the reactor coolant pressure boundary may not be maintained at the Davis Besse Nuclear Power Station." An Order was finalized in mid-November to shutdown Davis-Besse for safety inspections and presented to the Commission but never issued.

Following the abandonment of the Order on November 29, 2001, staff requested that the assessment of the five principles be discussed in a briefing to the Executive Director of Operations and the Commission's Technical Assistants.

The staff viewgraph acknowledged again that four of its five safety principles were NOT met for the extension of Davis-Besse's operation beyond the Bulletin advisory.

**[SLIDE 4]**

**RG 1.174 SAFETY PRINCIPLES**

- **Current Regulations are met**
  - It is likely that, if inspections were performed today, current regulations are not met with respect to TS [technical specifications] requirements and GDC [General Design Criteria in the Code of Federal Regulations]
- **Defense-in-depth is maintained**
  - It is likely that one of 3 barriers is degraded
  - However, Davis-Besse has a large, dry containment (conditional LERP [Large Early Release Probability] is 1.5E-03)
- **Sufficient safety margins are maintained**
  - It is likely that safety margins are reduced

- **Only a small increase in CDF results**
  - Incremental  $\Delta$ CDF (no comp measures) is 1.1E-06/ry to 1.3E-04/ry
  - Baseline CDF is xE-05/ry (not including external events)
- **The basis of risk management is monitored using performance measurement strategies**
  - Will not occur until inspection is performed

[From staff assessments to EDO, 11/30/2001]

We question the agency's confidence levels in the core damage evaluation given the large and numerous uncertainties in predicting cracks; given that NRC staff knew FirstEnergy had never fully inspected the reactor pressure vessel boundary and; given an internal NRC communication dated November 8, 2001 where FirstEnergy Vice President of Nuclear Operations acknowledges to the agency that "there is a high likelihood that they [Davis-Besse] have leaks" in the primary pressure boundary.

In fact, NRC Daily Status Report on the Bulletin dated November 30, 2001, staff acknowledged that NOT ONE of the principles was met with confidence:

[SLIDE 5]

**"Although operation in this condition could result in  $\Delta$ CDF and ICDP [Incremental Core Damage Probability] values that are above the normally accepted guidelines of RG 1.174 and RG 1.182, the analyses also indicate that the consequences of such an event would not constitute undue risk to the health and safety of the public."**

Despite findings that said "Don't do it", the process was derailed to extend the operation at Davis-Besse beyond the Bulletin advisory. In so doing, NIRS contends the agency unreasonably gambled an accident.

Given that containment sump system screens were subsequently found to be grossly undersized, a re-analysis of accident consequences would likely show an undue risk to public safety, as well.

The Task Force did not acknowledge, evaluate nor make recommendations on the NRC management action to abandon the studied judgment of the agency's established risk analysis technique for safety decision-making.

[SLIDE 6]

**The Task Force report does not adequately address documented financial considerations made by NRC management that prioritized production over public safety requirements.**

The abandonment of the Order and subsequently its regulatory basis is the result of an agency management culture that prioritized the corporate and financial concerns of FirstEnergy executives.

The Task Force report outlines that Davis-Besse's Technical Specifications (TS) require the reactor to begin shutdown within six hours of a determination of reactor leakage and cold shutdown within 30 hours.

The Task Force finding that NRC does not consistently enforce its licensing agreements for maintaining the reactor pressure boundary is extremely disturbing in light of the certainty of the adage "Rust never sleeps."

For NIRS, the agency's inconsistency speaks more clearly of an arbitrary policy of enforcement discretion on a matter vital to safety.

An internal email from an NRC manager to the Commission states, "we could have made an argument for immediate shutdown, but we are exercising discretion in allowing them to go to December 31<sup>st</sup>, but not beyond."

Another NRC internal communication states, "I said we can justify today to shut these plants down however we are exercising discretion noting it would clearly be punitive to immediately shut a plant down and they sit there for a month waiting to obtain the correct inspection equipment etc..."

NIRS questions the use of the word "punitive" in what sense? We can only conclude that an early shutdown for safety inspections is punitive to the company's maximum capacity factor and its annual financial reports.

Internal Commission communications dated November 21, 2001 clarify that FirstEnergy President Bob Sanders had spoken earlier to NRR Director Sam Collins to say that he did not want an order because idling the plant would have financial impacts. Interestingly enough, an email from the previous day by the Resident Inspector told staff that he had sat in on the station's morning management meeting and observed, "that licensee management expressed cautious optimism that the NRC would approve their plans to defer inspections until April 2002." Staff stated their surprise as "This is contrary to the message that was sent to D-B on Thursday, 11/14/2001."

The Order was never issued.

#### **[SLIDE 7]**

#### **Near Miss and Missed Opportunity**

The Task Force Report did not review nor make recommendations regarding the significant missed opportunity for NRC to have restored a measure of public confidence and trust by issuing the Davis-Besse Order. The agency could have demonstrated its commitment to public safety by enforcing the licensing agreement made with Davis-Besse as established by Federal law.

The NRC missed an opportunity to demonstrate a lesson learned from 1996 cover when TIME magazine "caught the Nuclear Regulatory Commission at a dangerous game that it

has played for years: routinely waiving safety rules to let plants keep costs down and stay online.”

Millions of lives ride on NRC safety decisions each day.

NIRS concurs with the emergency enforcement petition recently filed by Ohio Congressman Dennis Kucinich. It is more appropriate for NRC to set the example of its commitment to safety by holding a revocation hearing of FirstEnergy’s license rather than to proceed any further on the restart of the Davis-Besse’s reactor.



# **Industry Activities**

**Alex Marion**  
**Director Engineering**



# Industry Activities

- **INPO/FENOC Workshops**
  - **Organizational, human performance and management issues**
- **INPO Response**
  - **Enhancements in Cornerstone Programs - Evaluations, Assistance, Training and Operating Experience**

# **Industry Activities**

- **INPO CEO Conference**
  - **Safety Culture**
- **INPO Materials Department**
- **Review Visits on RCS Boundary Integrity**

# Industry Activities

- **Significant Operating Experience Report 02-4**
  - **Conduct case study of Davis-Besse Event**
  - **Assess organization's focus on nuclear safety**
  - **Identify and document abnormal plant conditions or indications**

# Industry Activities

- **NEI Executive Committee Resolution**
  - **Fully support industrywide effort to improve materials degradation management**
- **Self-Assessment of Materials Programs**
  - **Driven by recent plant events**
  - **Transition to a more proactive role**

# Industry Activities

## ■ Self-Assessment

- **Identify barriers or gaps in current materials programs**
- **Integrate industry programs**
  - ◆ **SG Management (SGMP)**
  - ◆ **PWR Materials Reliability (MRP)**
  - ◆ **BWR Vessel & Internals (BWR VIP)**
  - ◆ **Robust Fuel Program (RFP)**
  - ◆ **Chemistry, Corrosion and NDE**

# Industry Activities

- **EPRI technical coordination and support**
- **EPRI – NRC Collaborative Research**



# Industry Activities

- **Self Assessment Findings & Recommendations**
  - **Review and approval by industry Chief Nuclear Officers**
  - **Expected completion in May, 2003**

# Conclusion

- **Assessments and Lessons Learned by Industry & NRC**
  - **Maintain safety focus**
  - **Healthy**
  - **Positive**
  - **Continuous improvement**