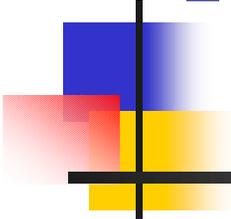
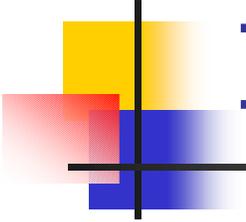


Current Regulatory and Safety Issues

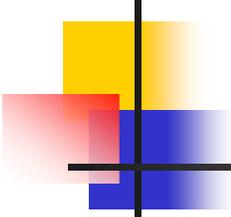


John W. Craig
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Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
NISA-USNRC/NRR Bilateral
Regulatory Information Exchange Meeting
October 30-31, 2003



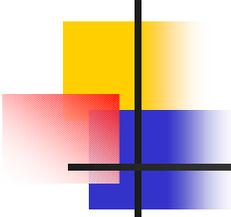
Current Regulatory and Safety Issues

- Reactor Materials Issues
- Pressurized Water Reactor Containment Sump Performance
- Electric Grid Reliability
- Emergency Preparedness and Security



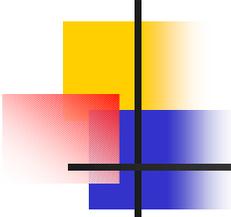
Reactor Materials Issues

- **Primary Water Stress Corrosion Cracking, Alloy 600/82/182**
 - **Reactor Vessel Upper Head Penetrations**
 - **Reactor Vessel Lower Head Penetrations**
 - **Other Locations in the RCS**



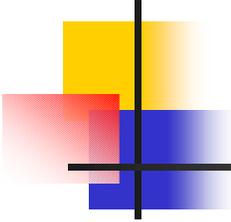
Reactor Materials Issues, cont.

- **Degradation of Mill Annealed Steam Generator Tubes**
 - **27 plants currently have this tube material**
 - **Approximately 8 plants plan to replace in the next 3 years**



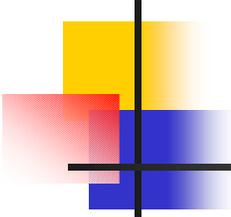
Reactor Materials Issues, cont.

- Immediate corrective or compensatory actions taken prior to catastrophic failures
- Materials degradation being factored into license renewal and power uprate reviews as applicable
- Challenge for both PWRs and BWRs
- Recent media interest – Davis Besse



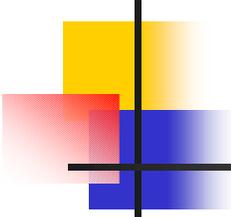
Reactor Materials Issues, cont.

- Challenge: to anticipate materials issues and to address proactively through well thought out inspection and repair/replacement strategies
 - NRC Responsibility
 - Industry Responsibility



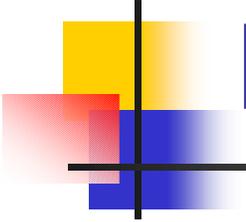
Reactor Materials Issues, cont.

- Industry Actions
 - BWR Vessel and Internals Program group has been more proactive
 - Other industry groups have been reactive
 - Institute of Nuclear Power Operations (INPO) has adopted a role in reviewing licensee programs in materials area
 - Improved non-destructive examination techniques



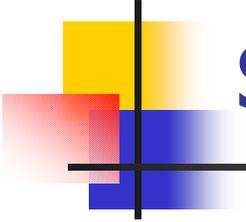
Reactor Materials Issues, cont.

- Regulatory Response
 - Issued Generic Communications (Information Notices, Bulletins, Orders)
 - Working with Codes and Standards Committees
 - Implementing Action Plan from Davis-Besse Lessons Learned Task Force report
 - Seeking International Operating Experience



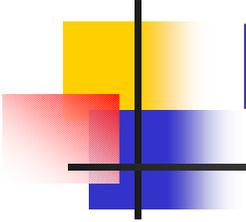
Reactor Materials Issues, cont.

- Regulatory Response, cont.
 - Training NRC Inspectors on inservice-inspection procedures
 - Conducting research to address known degradation mechanisms



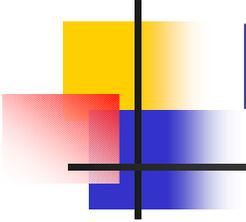
Reactor Materials Issues summary

- In summary,
 - Materials issues will continue to be a challenge as industry ages
 - Industry is positioning itself to provide more comprehensive approaches to address issues in a timely manner
 - NRC is continuing to verify the safety of our operating reactors.



PWR Containment Sump Performance

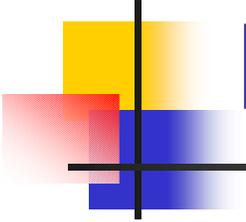
- Office of Nuclear Regulatory Research confirms generic concern for PWRs
 - Study used combination of plant-specific and generic data
 - Incorporated many conservatisms
 - Overall study not intended to be applied on a plant-specific basis
 - Concluded that sump screen blockage is a credible generic concern for PWRs



PWR Containment Sump Performance, cont.

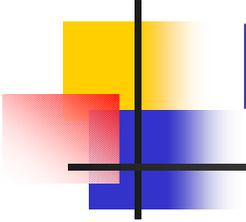
■ NRC Actions

- Issued Bulletin 2003-01 in June 2003
- Licensees were asked to describe plans to reduce risks associated with this issue
- NRC is reviewing responses to the Bulletin
- Compensatory measures should provide additional assurance of plant safety
- Regional offices will perform inspections to determine adequacy of licensee's actions



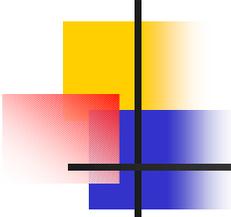
PWR Containment Sump Performance, cont.

- Challenges
 - NRC review and approval of industry guidance for evaluating susceptibility to sump clogging
 - Completion and assessment of ongoing research.
 - Increased concerns from stakeholders and members of the public



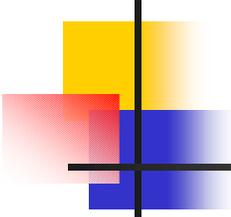
PWR Containment Sump Performance summary

- In summary,
 - the NRC is following a deliberate process that will resolve the sump issue for pressurized water reactors, on a plant-specific basis, while maintaining public health and safety.



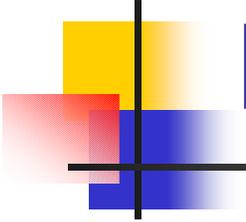
Electric Grid Reliability

- Background
 - NRC regulations provide requirements for having reliable electric power supplies at nuclear plants
 - 10 CFR 50, App. A, General Design Criterion 17, Electric Power Systems
 - 10 CFR 50.63, Station Blackout Rule
 - 10 CFR 50.65, Maintenance Rule



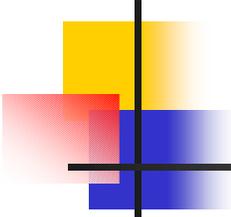
Electric Grid Reliability, cont.

- Deregulation of electric utility industry in mid-1990s
 - 1992 National Energy Policy Act (NEPA)
 - 1996, FERC issued orders requiring open access to the electric power transmission system
 - 50% of states now sell power in an open market



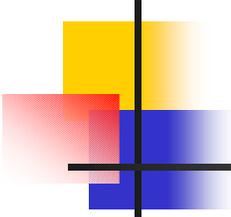
Electric Grid Reliability, cont.

- What Has Changed on the Grid?
 - Higher transmission system loading.
 - Lower grid reactive capabilities.
 - Lower grid operating voltage limits and action levels.
 - Increase in transmission line relief requests during summer.
 - Increase in coordination times to recover from grid disturbance



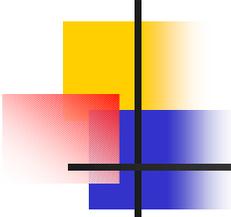
Electric Grid Reliability, cont.

- Challenging Safety Issues
 - Most losses-of-offsite-power (LOOP) occur in summer months.
 - Increase in induced LOOPs during summer.
 - Recovery from LOOP longer.
 - Risk from low voltage conditions.
 - Risk from on-line EDG maintenance



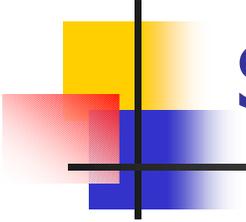
Electric Grid Reliability, cont.

- The August 14, 2003, blackout affected 10 nuclear plants, requiring nine of them to shut down (Davis-Besse was already shutdown)
- Multi-national Power System Outage Task Force headed by Secretary of Dept. of Energy, Spencer Abraham.
 - Nuclear Working Group headed by USNRC Chairman, Nils Diaz



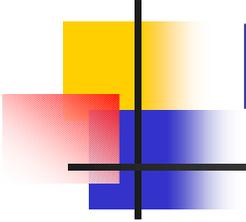
Electric Grid Reliability, cont.

- Other recent operating experiences have demonstrated need for continued attention in this area
 - Peach Bottom dual-unit scram – Sept. 15
 - NRC Augmented Inspection Team ongoing
- Best Practices as recommended by the USNRC Office of Research



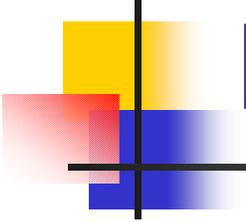
Electric Grid Reliability summary

- In summary,
 - Changes in grid performance have occurred since operating in a deregulated environment.
 - Grid performance can impact NPPs:
 - Response to accidents and transients
 - Blackout (coping) duration
 - Challenge safety equipment
 - Need to seek a better understanding of grid performance.



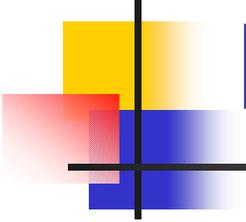
Emergency Preparedness and Plant Security

- Emergency Preparedness incorporates the following strategies:
 - Successful Planning (Emergency Planning)
 - Planning and coordination meetings
 - Procedure development/implementation
 - Training
 - Drills and exercises
 - Pre-positioning/maintenance of equipment
 - Successful Response to Events (Emergency Response)



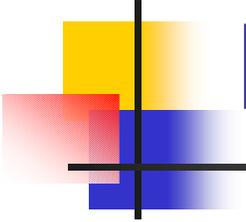
Emergency Preparedness and Plant Security, cont.

- Emergency Planning is an important part of NRC's defense-in-depth safety philosophy:
 - High quality in design, construction and operation of plants
 - Safety systems to reduce chances of malfunctions
 - Containment structures to prevent release of fission products offsite
 - **Emergency Planning**



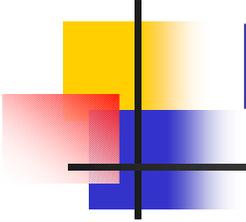
Emergency Preparedness and Plant Security, cont.

- EP and security of U. S. nuclear power plants have received significant attention since 9/11/01
 - Indian Point and public concern
 - James L. Witt study commissioned by the State of New York
 - Emergency Plans are not dependent on initiating scenario (whether terrorist related or not).



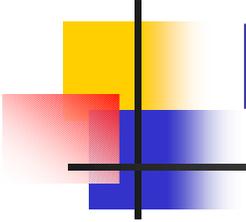
Emergency Preparedness and Plant Security, cont.

- Emergency Planning in the news
 - Significant Misinformation in Public Domain
 - Such misinformation is a disservice to the public, instilling unwarranted fears.
 - Even the J. L. Witt report stated: “harm to the public could arise from misuse of data”



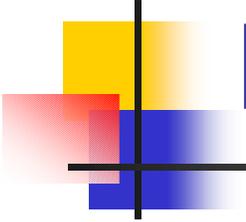
Emergency Preparedness and Plant Security, cont.

- Emergency Response was considered robust even before 9/11/01
- It has been enhanced since then, particularly the security aspects:
 - Interagency/interstate terrorism exercise (TOPOFF 2) in May 2003
 - NRC continues to work with Dept. of Homeland Security and other Federal agencies



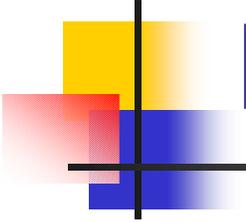
Emergency Preparedness and Plant Security, cont.

- NRC response to new threat environment
 - The NRC has issued a number of requirements since 9/11/01 to enhance security of nuclear plants
 - Inspections of licensees' implementation of new security requirements continues



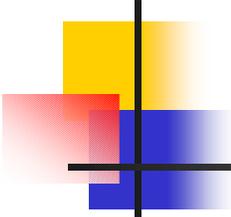
Emergency Preparedness and Plant Security summary

- In summary,
 - Clarification of myths in public domain about emergency preparedness and security remains a challenge
 - A robust emergency preparedness program exists and is continuing to improve
 - A number of new security enhancements have been implemented since 9/11/01



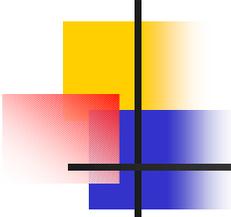
Discussion of Key NRR Programs in the Reactor Arena

- Reactor Oversight
- Power Upgrades
- License Renewal
- New Reactor Licensing



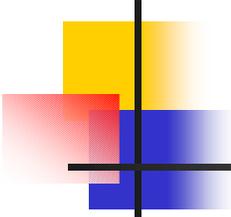
Reactor Oversight

- The current risk-informed Reactor Oversight Program is nearly four years old
- The Davis-Besse issue has been a significant challenge
- Browns Ferry Unit 1 restarting after 18 years
- Construction Inspection Program development is gaining traction
- Stakeholders are key to program's success



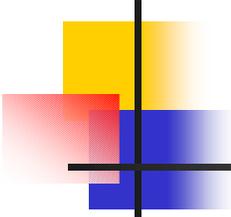
Reactor Power Uprates

- This NRR program continues to be a high priority with the Commission
 - To date, 99 power uprates have been approved for a total of ~4000 Mwe added to the U.S. grid
 - Technical Challenges arose recently with the Quad Cities Dryer Cracking Issue
 - Process Improvements have been made
- The Power Uprate program is a success



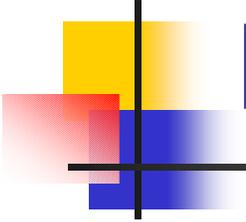
License Renewal

- Extends 40-year license by 20 years
- 18 units at 9 plant locations completed
- Currently 8 applications under review for 15 more units at 10 plants
- More applications are expected: 19 applications for 30 units over next three years



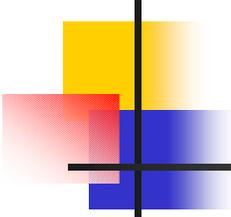
License Renewal, cont.

- License renewal focuses on licensees' equipment aging management programs
- NRR project managers are assigned (and dedicated) to each renewal package for the entire 22 to 30-month process
- Public Involvement is Important
- Process Improvements
- Program has been successful



New Reactor Licensing

- Key activities include:
 - Design Certification review for the Westinghouse AP-1000 advanced design
 - Preapplication reviews for the GE ESBWR design and the AECL, Ltd. ACR-700 design
- Recent milestone:
 - Received two applications for an early site permit under 10 CFR 52



New Reactor Licensing, cont.

- Challenges
 - Regulatory Infrastructure Development work
 - Schedule delays for ESP applications due to continued studies involving seismic modeling for affected locations
 - Differences in design from previous reviews require infrastructure improvements related to the ACR-700 review
 - Combined License Applications – the first could be received in 2006 timeframe