NUCLEAR REGULATORY COMMISSION

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BRIEFING ON REACTOR SAFETY AND LICENSING ACTIVITIES

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THURSDAY,

DECEMBER 9, 2004

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The Commission met in open session at 2:00 p.m., at the Nuclear Regulatory Commission, One White Flint North, Rockville, Maryland, the Honorable Nils Diaz, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

NILS J. DIAZ	Chairman of the Commission
EDWARD McGAFFIGAN	Commissioner
JEFFREY S. MERRIFIELD	Commissioner

NRC STAFF PRESENT:

RICHARD BARRETT

JIM DYER

JOHN HANNON

MIKE MAYFIELD

LUIS A. REYES

STUART RICHARDS

THOMAS SCARBROUGH

BRIAN SHERON

P-R-O-C-E-E-D-I-N-G-S

CHAIRMAN DIAZ: Good afternoon and welcome to the Reactor session. This is the special fall treat. Is that where we're getting ahead of the issue?

MR. DYER: I think I have the spring, fall, summer.

CHAIRMAN DIAZ: I see. You have the spring, fall, summer. I think we should all realize this is a special meeting that Commissioners wanted to have so that the staff will come and brief us on a series of topics that are always considered priority issues either because their amount of activity or because of their worth in safety. I think the selection the staff has made is an excellent selection. We look forward to an in-depth briefing on these issues and I expect a very, very good afternoon of discussion with my fellow Commissioners.

I notice there are some things that are not in here, I think, that appropriately not in here. We don't talk about 50.69 or 50.46 that would take the entire day. I don't think we have the entire day, but I do believe these are important issues that we'll be discussing again or revisiting this year. With that, Commissioner McGaffigan, Commission Merrifield do you have anything?

COMMISSIONER MERRIFIELD: No thank you.

CHAIRMAN DIAZ: Mr. Reyes, the floor is yours.

MR. REYES: Mr. Chairman, Commissioners, the Staff is ready to brief the Commission on Reactor Safety and Licensing Activities. We have representatives from the Office of Nuclear Reactor Regulation and the Office of Research. The two offices work together to deal in these issues.

As you have stated, we have a selected number of topics we though we'd discuss today. There are a larger number of issues, but because of the time and the interest, we're going to limit it to a few. Let me just turn the floor over to Jim to start the presentation.

MR. DYER: Thank you, Luis. Good afternoon, Chairman, Commissioners. Slide

two please. This is my list of acronyms that we'll be using throughout the presentation today. I don't know if you noticed but we didn't have to use them yesterday. That's because we took a little time and tried to get them incorporated in, but today we're back to our old mold of just identifying up front as we were taking up a lot of space. Slide three please.

The purpose of today's Commission meeting is to discuss selected reactor safety and licensing activities. Deciding on what to discuss during the allotted time was a big challenge. In developing the agenda, we considered topics from the other Commission meetings both being planned and recently accomplished to eliminate and shorten some of our topics. However, we are ready to answer any questions you may have on the subjects that we put in the agenda.

Our resulting agenda is shown on this slide. After my overview, Brian Sheron will provide you a status of emerging technical issues. Some of these are status updates on issues already previously presented to the Commission and the last issue is new having been raised to our review of operating experience.

We are also presenting updates on two program areas. John Hannon will present the fire protection program efforts to bring stability to some of the long-standing issues in this area and Stu Richards will present selected aspects of the reactor oversight process that we wanted to inform the Commission about before the Agency action review meeting later this summer.

Mike Mayfield from the Office of Research is also here with us at the table. Research contribution to all these topics is apparent in our discussions and Mike is going to be available to answer any of the questions on the research activities in these areas.

Before Brian's presentation, I would like to briefly discuss two important licensing activities that were removed from the presentation for timeliness reasons but are still part of your background packages. That is license renewal and power uprates.

First, three points on the license renewal program, (1) it continues to be a very successful program with 30 licenses safely renewed at 17 sites; (2) the piloted onsite reviews of the generic aging lessons learned issues are going well. Draft safety evaluations contain fewer to no open items and the ACRS recently complimented us on the quality of our audit program; and (3) we are looking to expand and update the generic aging lessons learned reports and other license renewal guidance to capture new information and to continue the improvements in this program.

The second program area, power uprate program, continues to present technical challenges to the staff. The inability to successfully implement a measurement uncertainty uprate amendment at the Fort Calhoun Station caused them to return to their original license power. The technical issues that Brian Sheron will discuss concerning boiling water reactor extended power uprates has delayed our review of the Vermont Yankee uprate request and will delay the Brown's Ferry extended power uprates submittal sufficiently that the Tennessee Valley Authority, the licensee, is no longer pursuing license renewal, power uprate and Unit 1 restart simultaneously.

I want to assure the Commission though that we will not approve any power uprates until we are sure that adequate safety margins will be maintained. Now let me turn the presentation over to Brian Sheron for discussion on the emerging technical issues.

DR. SHERON: Okay. Thank you. I'm Brian Sheron. I'm the Associate Director for Project Licensing and Technical Analysis in NRR. I would like to discuss four emerging technical issues, first challenges associated with power uprates, generic safety issue GSI-191 involving pressurized water reactor sump screen issues, electric grid reliability and buried medium energy cables. Next slide please.

Power uprates for BWRs typically involve increasing the feedwater and steam flows which have the potential to put additional stresses on components. While the potential for

cracking of components inside the reactor vessel has been a long-standing issue in boiling water reactors, some nuclear power plants have experienced additional problems following implementation of new power uprates. For example, steam dryers at certain boiling water reactor plants have experienced structural failure and in some cases, fractured metal parts from the steam dryer have fallen into the reactor and into the steam lines leading to the turbine generator during extended power uprate operation.

Also recent plant inspections have identified safety related valves that have failed as a result of increased flow induced vibration and sampling probes that have broken off inside the feedwater piping within a relatively short period of time under the higher feedwater flow conditions associated with extended power uprate conditions. The cause of these performance problems has been attributed to increased flow induced vibration and acoustic loads resulting from higher steam and feedwater flow under extended power uprate operation. Next slide please.

Although steam dryer and sampling probes do not have a safety related function, their failure can generate loose parts and adversely impact safety-related components inside the reactor vessel and the connecting piping systems. The BWRs most susceptible to steam dryer failures are those boiling water reactors with the older square hood steam dryer design and higher steam velocities. Reactors with the slanted hood and curved hood steam dryers have not seen similar failures at extended power uprate conditions.

So far, the industry has not been able to adequately characterize the structural loadings resulting from higher steam velocities. Thus, industry has been unable to predict the location or onset of cracking and assure that design modifications to square hood dryers are sufficient to prevent future cracking. Next slide please.

COMMISSIONER McGAFFIGAN: Mr. Chairman, just for clarifying, could you tell us where the square hood steam dryers are? Quad Cities.

DR. SHERON: Quad Cities 1 and 2, Dresden 2 and 3, Monticello, Vermont Yankee and Pilgrim.

COMMISSIONER McGAFFIGAN: Okay. Go ahead. Thank you.

DR. SHERON: Licensees of boiling water reactors are aware of and are responding to this issue. Quad Cities Units 1 and 2 which have experienced severe steam dryer failures have reduced power to pre-extended power uprate levels and are assessing the source of the loads causing these failures. In addition, the licensee is planning to replace its steam dryers in both units with a more resistant design and plans to instrument one of the new dryers to define the loads.

COMMISSIONER McGAFFIGAN: Again, could I clarify? You say "more resistant." Is it physically allowable for them to put in the slanted design in the Quad Cities? I mean is there any physical reason why they can't go to a slant design?

DR. SHERON: I'm going to have to ask the staff. They've looked at the replaced design.

MR. SCARBROUGH: Hello, I'm Tom Scarbrough with Mechanical Engineering branch. They actually are designing a brand new design for Quad Cities. It is slanted, but they are working on it right now. They haven't actually finalized it. They are going to describe it to us in January.

COMMISSIONER McGAFFIGAN: Okay, but they're moving away from this design that has been problematic and it may not be identical to, say, something at LaSalle or something, but it will be a lot closer and less susceptible.

MR. SCARBROUGH: Yes, sir. It will be much more slanted than what they have now.

COMMISSIONER McGAFFIGAN: Thank you.

DR. SHERON: Other potentially effected boiling water reactor plants are

monitoring steam plant parameters that could indicate steam dryer failure and are inspecting their steam dryers during refueling outages in accordance with industry guidelines. The BWR owners' group is leading the industry's activities including preparation of revised steam dryer inspection guidelines and validation of the steam dryer loading methodology using the latest analytical tools and scale model testing.

Licensees applying for extended power uprates are addressing potential adverse flow effects including modifying the steam dryer to significantly increase its structural capability and performing detailed analyses of the steam dryer. They are also investigating other compensatory measures. Next slide please.

I would now like to discuss staff activities. For those plants that have experienced severe flow-induced vibrations, we are monitoring their corrective actions prior to the return to EPU operation. For current power uprate requests, the staff is reviewing the actions being taken by licensees to eliminate adverse flow effects.

For example, the staff conducted a technical audit of a licensee's steam dryer analysis methods and will review the updated analysis performed by the licensee once submitted. The staff will also review the licensee's plans for a step-wise approach in increasing reactor power to ensure adequate hold points for data collection and evaluation and is reviewing the licensee's actions to eliminate adverse flow effects on other plant components at the subsystem level.

The Office of Nuclear Regulatory Research is also performing activities to address the issue. RES provides direct support to NRR through active participation in meetings with licensees and is also evaluating the phenomena that could be the cause of adverse flow effects in steam dryers, for example, acoustic excitation, vortex shedding or turbulent loading and is working to determine the dynamic pressure loadings on steam dryer components.

The overall goal of this RES effort is to assess the generic implications for power

uprate conditions and to develop, if feasible, analytical tools that NRR could use to review submittals on BWR power uprates. For future power uprate reviews, the staff plans to update the extended power uprate review standard to incorporate lessons learned. Next slide please.

With respect to our future plans, the staff will continue its ongoing review of two boiling water reactor plant requests to operate at extended power uprate levels. That is Vermont Yankee and Brown's Ferry. The staff will evaluate actions taken by the BWR owners group to adequately determine the loads on the steam dryers during power uprate operations.

These efforts include instrumentation of a steam dryer to collect actual pressure load data during extended power uprate operation, performance of scale model testing of steam dryers of various designs and evaluating the ability of updated analysis methods to predict the load's experience by its steam dryers during power uprate operation. Upon completion of these activities, the staff will determine whether further regulatory action is needed. Next slide please.

Next I would like to discuss progress towards resolving GIS-191, assessment of debris accumulation on pressurized water reactor sump performance. The staff discussed this issue with the Commission on October 15, 2003 during the briefing on license renewal program, power uprate activities and high priority activities which was the equivalent of this meeting last year.

GIS-191 was established in 1996 to reassess the effects of sump screen debris blockage on emergency core cooling system and containment spray system recirculation functions following a loss of coolant accident or high energy line break. This reassessment was warranted due to staff questions and concerns pertaining to the 50 percent sump blockage assumption which was determined to be non-conservative and events that occurred in the early 1990s at Barsebäk, Perry Unit 1 and Limerick Unit 1 that involved some screen clogging.

This issue was resolved for boiling water reactors in the 1990s. However findings from the research performed to resolve the boiling water reactor issue raised questions

concerning the adequacy of pressurized water reactor sump designs.

To resolve this issue, the NRC decided on a two-step approach. The first step was to issue Bulletin 2003-01 in June of 2003. This bulletin informed addressees of this new information and requested that licensees either confirm their compliance with 10 CFR 50.46, Section B(5) and other applicable regulatory requirements or until such confirmation could be completed, describe any interim compensatory measures implemented to reduce risk or enhance the capability of the ECCS and the containment spray system recirculation functions.

The second step was to issue generic letter 2004-02 in September of 2004 which requested that licensees perform plant specific evaluations to determine compliance with regulatory requirements per the bulletin and implement corrective actions including plant modifications as necessary in accordance with the NCR's proposed resolution schedule. These actions would support the Agency's resolution end date of December 2007. Next slide please.

The Nuclear Energy Institute submitted the industry's sump performance evaluation methodology in May of 2004. The staff, both NRR and RES, reviewed the industry evaluation methodology and prepared a safety evaluation. Certain portions of the industry methodology needed to be supplemented because the methods did not contain sufficient guidance, supporting data or analysis to provide adequate technical basis. For these areas, the staff provided limitations and restrictions, modifications, recommendations or alternative guidance to that proposed by the industry.

The safety evaluation was reviewed by the Advisory Committee on Reactor Safeguards and the Committee to Review Generic Requirements. The staff also briefed the Commission Technical Assistants on the methodology. The ACRS raised questions and concerns regarding various technical aspects and staff positions presented in the draft safety evaluation methodology. These issues were documented in an October 18, 2004 letter to the Commission.

The staff responded to the ACRS comments and enhanced the safety evaluation to address the comments as appropriate. The staff issued the final safety evaluation for ECCS sump performance evaluation on December 6, 2004. Together the industry guidance and the staff safety evaluation provide one acceptable method for evaluating sump screen performance. Next slide please.

The staff intends to conduct public meetings associated with the generic letter and the safety evaluation in the near future. The staff also participated in an NEI workshop in early December of 2004. Despite the substantial experience and information base regarding GSI-191, deficiencies in data and knowledge do exist in certain technical areas.

In one such area, the Office of Nuclear Regulatory Research is participating in ongoing efforts associated with chemical precipitation effects testing. This testing is being conducted at the University of New Mexico and will provide the staff and industry with a better understanding of how chemical effects need to be evaluated and incorporated in the overall assessment of sump performance.

Other areas where gaps exist in the empirical knowledge base include floating debris and head loss correlations. The Office of Nuclear Regulatory Research is planning to perform confirmatory head loss testing. The staff will supplement the safety evaluation as necessary based on the outcome of this testing.

Downstream effects which are the impact of debris on pumps and valves downstream of the sump screens are considered by the staff to be an integral part of the evaluation methodology. The industry has requested that these effects be considered at a later time. However the staff is determined that the downstream effects must be evaluated in the initial assessment to ensure they are properly accounted for when sump design changes and modifications are performed. Next slide please.

The NEI guidance as approved by the staff's safety evaluation provides an

acceptable evaluation methodology for addressing this important safety issue. Resolution of GIS-191 will result in real safety improvement. The knowledge limitations and the conditions for methodology application are understood by the staff and the industry and are clearly identified and addressed in the safety evaluation.

Uncertainties in data are addressed by conservative assumptions to ensure a robust defensible solution. Consequently, the staff concludes that the safety evaluation provides an acceptable methodology that licensees can apply for responding to generic letter 2004-02 and to resolve GSI-191. With the issuance of the safety evaluation methodology, the staff remains on schedule to close GSI-191 in December of 2007. Next slide please.

Next I will be discussing grid reliability. This issue was previously discussed with the Commission on May 10, 2004. The power blackout event on August 14, 2003 highlighted the fact that the nation's electric grid is no longer being operated in the manner that was considered when plants were licensed.

A reliable grid ensures the availability of the offsite power system which is the preferred power supply and at an acceptable voltage which helps ensure the safe operation of the nuclear power plants. Following deterministic and risk evaluations, it was concluded for the reasons listed on the slide that there was an urgency to address before the summer of 2004 plant operational readiness in anticipation that an event similar to the August 14, 2003 East Coast blackout event might recur. Next slide please.

First, the staff raised awareness of the concerns by developing and issuing a Regulatory Issue Summary or a RIS 2004-05 which was entitled "Grid Reliability and the Impact of Plant Risk and the Operability of Offsite Power," highlighting the significance of grid reliability and assuring the safe operation of nuclear power plants. Second, the staff assessed the licensee's readiness to manage any degraded or losses of offsite power through inspections and interviews using Temporary Instruction TI-2515/156 entitled "Offsite Power System

Operational Readiness."

Lastly, the staff monitored and reviewed conditions and events through the summer of 2004. From the temporary instruction data, the staff found that there were no significant health and safety issues that would require prompt regulatory action during the summer of 2004. Nevertheless, there were areas identified in which communication protocols between the licensees and the grid operators could and should be improved.

The NRC staff has since established Memoranda of Agreements with the North American Electric Reliability Council or NERC and the Federal Energy Regulatory Commission or FERC. In the Memoranda of Agreements, NERC, FERC and the NRC have agreed to consult with each other regarding the availability of technical information and to promote and encourage a free flow of such information pertaining to electric grid reliability, security and integrity.

The NRR staff is reviewing the Office of Nuclear Regulatory Research reports titled "Loss of Offsite Power Frequency and Duration Analysis" and "Status of the Investigation of Grid Operating Data" for signs of change and potential vulnerabilities. RES is working on another report, "Loss of Offsite Power Risk Analyses in Emergency Diesel Generator Reliability" scheduled to be completed in January of 2005. These reports will provide an assessment of the safety significance of this issue. Next slide please.

Regarding next steps, the staff is considering a generic communication that will address communication protocol agreements between the nuclear power plant and the grid operators. The purpose of the generic communication would be to ensure that the nuclear power plant is informed when the grid is stressed to the point that a trip of the nuclear power plant would result in inadequate post trip switch yard voltages for either actual grid conditions or predicted grid conditions. In the longer term, the staff will determine the need to reevaluate existing regulatory requirements. Next slide please.

COMMISSIONER MERRIFIELD: Mr. Chairman, just a clarification on that particular one. Is there a time set for the generic communication, a planning time for when that is going to be sent to licensees?

DR. SHERON: I think we're thinking probably sometime in the spring.

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman.

CHAIRMAN DIAZ: Before next summer, things should be in place.

DR. SHERON: Yes. Last issue I would like to briefly touch on is failure of certain buried medium energy cables. According to existing operating experience, there have been 22 reported cable failures. Buried cables are used to carry power for safety related functions such as feeding safety buses from offsite sources or emergency diesel generators.

They also are used for power and control for systems such as emergency service water and containment sprays. These cables were routed underground because of their physical location. There are about six to eight of these cables at each plant. These cables were qualified as safety grade for safety related use but did not have specific qualifications to withstand continued exposure to a moist environment.

No early failures were observed because of the ruggedness of the cable design. But as the cables continue to age, the continued exposure to moisture and other chemical leeching could result in common mode failures. The staff is addressing this issue in its early stage because of its potential risk significance. The failures of certain cables in this category could lead to a loss of both trains which could result in non-recovery of offsite power. Next slide please.

The staff has engaged the industry on this issue and industry has committed to submit a white paper on the subject in October but has not done so to date. Because of the potential impact on the reliability of safety related equipment, the staff is evaluating if and what sort of regulatory action may be needed. This completes my presentation. I will now turn it

over to Mr. John Hannon who will discuss fire protection issues.

MR. HANNON: Thank you, Brian. I'm John Hannon. The staff is focusing on bringing regulatory stability to our fire protection program. Closure is expected on several long-standing fire protection issues by the spring of 2005. Next slide please.

Staff is concentrated on bringing closure to three major issues, First, the development of a risk informed performance based alternative within 10 CFR 50.48; second, providing guidance on post fire safe shutdown circuit analysis; and third, the development of rulemaking to revise Appendix R to codify feasible and reliable operator manual actions. Bringing closure to these three long-standing issues will improve safety by focusing resources on risk significant aspects of fire protection.

While these three areas have been our primary focus, other concerns continue to emerge. To effectively manage these emerging issues, the staff works with industry using a model of the protocol applied in the resolution of steam generator issues. The protocol we have in place will continue to guide us as new issues emerge in fire protection.

Also we must understand the tools in development across the fire protection industry and assess their regulatory applicability. Advancements such as fire risk analysis and computer-aided fire modeling will assist us as we continue to progress forward a more risk informed, performance based environment. Next slide please.

Revising 10 CFR 50.48 to allow a risk informed, performance based approach through the National Fire Protection Association's NFPA 805 provides a voluntary means for licensees to redefine poorly specified fire protection licensing bases. It also enables licensees to manage their fire protection programs including changes with minimal regulatory intervention.

The final rule and an interim enforcement discretion policy was approved this past May via a Staff Requirements Memorandum. The rule was published in June and became effective on July 16th. The Nuclear Energy Institute developed implementation guidance for

NFPA 805 in NEI 0402. A draft regulatory guide endorsing NEI 0402 was issued for public comment in September and we will issue the final regulatory guide in the spring of 2005. Licensee applications to transition to NFPA 805 are anticipated this coming summer. Next slide please.

In November of 2000, the NRC temporarily suspended inspections of selected post fire safe shutdown related circuits to focus inspection resources on known risk significant areas while the industry embarked on a testing plan to clarify the risk significance of the circuit issue. In 2002, testing conducted by NEI and EPRI confirmed that multiple hot shorts are in fact credible.

The staff's primary goal with circuit analysis is to provide guidance to licensees and NRC inspectors on a risk informed approach to post fire safe shutdown circuit inspection which includes multiple spurious actuations. Regulatory Issue Summary 2004-03 was issued this past March and provides NRC's planned approach for inspecting circuit configurations that subject to fire induced hot shorts.

Post fire safe shutdown circuit analysis inspections will resume in January 2005. The staff will provide an enforcement discretion period based upon licensees' self-evaluations. This will permit adequate time for the licensees to perform in-depth review of their safe shutdown circuit analysis to facilitate closure of this long-standing fire protection issue.

Another goal of the staff is to clarify NRC expectations for compliance with Appendix R post fire safe shutdown circuit requirements. Generic communication is planned for the first quarter of 2005 that will clearly articulate the NRC's expectations for compliance with Appendix R and will endorse industry guidance as one acceptable means of demonstrated compliance. Next slide please.

The goal of the operator manual actions rulemaking is to revise Appendix R to allow operator manual actions and to codify their acceptance criteria so that operator manual

actions employed in lieu of training, separation or fire barriers will be uniformly evaluated by the licensees and inspectors. The proposed rule provides a comparable defense-in-depth option that will require licensees to demonstrate the acceptability of manual actions used to safely shut down a plant in the event of a fire.

In November of last year, the staff held a public meeting to solicit stakeholder comments on the acceptance criteria which would be included in the revision to the rule. Criteria were developed to make an operator manual action both feasible as well as reliable. The staff conducted a second public meeting this past June to further discuss the condition for detection and suppression in the area of the fire and examine the possibility of applying the acceptance criteria to all of manual actions allowed for post fire safe shutdown. Currently, the proposed rule and a draft Reg Guide are expected to reach the Commission for approval by the end of this year. Next slide.

Separate from these three major efforts, fire protection regularly has emerging issues that require the attention of staff. To facilitate the resolution of these emerging issues, we have established a protocol between the industry and the NRC. This process is intended to identify emerging fire protection generic issues, discuss priorities and schedules, and facilitate improved coordination without affecting NRC's oversight responsibility. Issues are tracked, prioritized and given an action status by the responsible party. The stakeholders are kept informed through publicly issued meeting summaries. Next slide please.

Advancements have been made with several regulatory tools that the staff can utilize to better insure fire protection safety. For example, the updated fire protection STP simplifies the process without reducing safety by screening out very low risk findings that do not warrant further NRC involvement. In addition, the staff published the fire dynamics tools of NUREG-1805 to provide fire inspectors with a simplified risk informed methodology to quantitatively assess potential fire hazards and assist in determining if a fire scenario can cause

critical damage to safe shutdown components.

The Office of Research is supporting the fire PRA Requantification Study and the Fire Modeling Verification and Validation Study. The fire PRA Requantification Study is available in draft form now. The Fire Modeling V and V will be available in draft form by March of 2005. Both of these studies will provide acceptable methods to satisfy the requirements of NFPA 805.

Another advancement in regulatory tools is the ANS fire PRA standard which will be published in draft form in 2005. This new standard will provide criteria that can be applied in future fire PRAs that supported option of NFPA 805. The staff plans to endorse the ANS fire PRA standard when it becomes available. This will be accomplished through a revision to Reg Guide 1.200, an approach for determining the technical adequacy of PRA results for risk informed activities.

In conclusion, the fire protection staff is working hard to meet the challenge of bringing key issues to closure. Our stakeholders expect regulation and enforcement to ensure protection from all nuclear fire protection hazards. The staff plans to meet these expectations through continued progress and risk informing, both are regulations, and our inspection activities, applying regulatory tools appropriately and by effectively managing emerging fire protection issues. That's completes my prepared remarks. I would like to turn it over to Stu Richards now.

MR. RICHARDS: Thank you, John and good afternoon. I'm Stu Richards, Chief of the Inspection Program Branch in the NRR Division of Inspection Program Management. I will discussing activities related to industry performance trends, development of the Mitigating Systems Performance Index, the status of our efforts to assign significance to inspection findings in a timely way and I will update you on the status of the implementation of a revised inspection process in the engineering area. Next slide please.

The NRC has a program to trend the long-term performance of the industry. Industry trends are periodically reviewed by NRC management and are specifically reviewed by Agency senior management at the Agency Action Review Meeting in the spring of each year. The trends are subsequently reported to the Commission in a Commission paper and are also discussing during the Commission meeting which follows the Agency Action Review Meeting.

To recap industry performance from fiscal year 2003, we concluded that there were no statistically significant adverse trends. There were, however, three indicators that warranted an increased look by the staff. The number of automatic SCRAMS was up in Fiscal Year 2003, largely the result of problems on the grid or problems in switch yards. As previously discussed by Dr. Sheron, the Agency has an initiative underway to look at grid reliability.

The second indicator of note was the safety system actuation's performance indicator. This indicator tends to follow the SCRAMS indicator. In this case, for example, the August 2003 blackout event in the Northeast resulted in nine SCRAMS and 12 safety system actuations.

The third indicator of interest was the equipment forced outage rate performance indicator. The increase in this indicator was mainly driven by the manner in which one licensee reported outage extensions. Next slide please.

With regard to industry trends for this year, the final trending data for Fiscal Year 2004 will not be available until January. However, based on the data through June of this year, all of the industry trend indicators are on a track consistent with the baseline trends of the last several years. For example, the number of automatic SCRAMS for all of Fiscal Year 2004 was about 52 with a baseline number of about 55. By comparison, the number of automated SCRAMS in Fiscal Year 2003 was 77. Next slide please.

Our activities with the Mitigating Systems Performance Index or MSPI have come a long way since we last discussed it with the Commission in the spring of this year. As you're

aware, the Performance Indicator Program is a voluntary program for licensees and as such, the staff works closely with the industry in implementing the program.

We have monthly meetings to discuss the reactor oversight process issues including performance indicators and we have been conducting additional monthly meetings specifically to address MSPI. This year we reached agreement with the industry on the most significant technical issues and committed in a letter to the Nuclear Energy Institute to go forward with implementation of MSPI. The target for implementation is the first quarter of Calendar Year 2006. Next slide please.

There are a number of activities that need to be completed by both the staff and the industry before MSPI can be implemented. A licensee's PRA is an important aspect of MSPI. To determine the needed characteristics of a PRA for use with MSPI, we have formed a joint staff/industry task force to examine the issue. Their work should be done soon and will help focus the staff's efforts on the most important aspects of MSPI.

In parallel, the staff is working with industry to define the details of the MSPI implementation guidance. The industry plans a series of three workshops in Calendar Year 2005 to assist licensees in consistent and efficient implementation of MSPI. The staff plans to be represented at these workshops.

The industry will also draft an MSPI basis document for each plant in a standard format which will help the staff when inspecting the implementation process. NRC's staff activities include conducting training for inspectors, issuing a Regulatory Issue Summary to document the change in performance indicators, tracking a communications plan, defining inspection and review requirements and carrying out those inspections and reviews. The industry has agreed that MSPI will be implemented at all sites at the same time so that we won't have a situation where plants are split between the old and the new PI. Next slide please.

One of the goals of the Reactor Oversight Process or ROP is to assess the

significance of inspection findings in a timely way and to use those findings to assign inspection resources based on licensee performance. We routinely assess about 700 findings per year that screen directly to green which are findings of very low safety significance. These are not the problem.

However our present operating plan goal in this fiscal year is to complete the assessment of 85 percent of the findings that are initially assessed as greater than green in 90 days or less. Thus far, we have not been successful in achieving this goal. In spite of our efforts over the past several years to improve our process tools, our present timeliness measures stand at about 70 percent. There are a number of reasons for this including past challenges associated with assessing the risk significance of complex fire protection issues and other unique findings such as nozzle cracking of control rod drive mechanisms. Next slide please.

The staff has been considering changes in the implementation of the Significance Determination Process in order to improve our timeliness. We're still discussing potential paths forward with various internal stakeholders so our presentation today is only to provide the Commission with a preview of where the staff is headed.

The first and most significant issue is that in order to be timely we cannot spend an inordinate amount of time determining our preliminary risk assessment. Our inclination is to do a detailed technical review of each findings that is potentially greater than green. However for those complex or unique findings that we occasionally face, conducting such a detailed review can require an excessive amount of time and staff resources.

Furthermore, we need to recognize that our work in this area is nearly always to estimate the risk impact of a degraded condition that has already been corrected by the licensee. In contrast, risk calculations that support licensing amendments and rulemaking have long term future impacts on the operations of our licensed facilities.

Therefore, we are considering generally requiring that our initial risk estimate be based on the less detailed analysis than we have in the past. We are also considering developing more qualitative criteria for those findings that don't fit well into existing significance determination process tools.

In order to achieve our timeliness goals, we will have to adhere to strict time lines in conducting our risk assessments. For example, to achieve 90 days, we will need to issue our preliminary assessment to licensees in 30 days and then allow the licensee no more than 30 days to provide information on the issue to us either in writing or verbally in a public meeting. The staff would then have 30 days to consider the additional information received and to issue our final determination. To maintain discipline with our time line, we are considering requiring explicit NRR Office Director and Regional Administrator approval to exceed the time allowed.

If information becomes available after the final risk determination is made, our current process allows for reconsideration of the determination. Our experience has been that some licensees will go to great effort and expense to challenge the staff's significance determination for findings that are greater than green. However, the ROP was designed to provide timely and risk-informed staff assessments of licensee performance and to direct our supplemental inspection resources and we should therefore not modify our time line to accommodate these licensee effort, but rather consider any subsequently provided data when it becomes available. We need to recognize and accept that our significance determinations for some findings may change after final significance determination is made based on additional information that becomes available after the fact.

We understand that industry has formed a task group to consider changes to the STP process. Some members of the industry have observed that large amounts of both NRC and licensee effort and time can be invested in some significance determinations and have agreed that this is not resources well spent. The industry has indicated that they intend to be

prepared to discuss their thoughts in this area with the staff in January.

Going forward, if substantive changes to the process are proposed, we'll write a Commission paper to outline for the Commission the options available and the staff's recommendations. For instance, we may recommend that our timeliness goals take a graduated approach and be based on the level of complexity and the potential risk significance of a finding. For example, complex fire protection issues may be a category that warrant additional time to determine significance and for those issues that preliminarily screen as yellow or red, additional time may be appropriate because the long term impact of a single yellow or red finding can be significant for both the licensee and the staff. Next slide please.

Early this year, the Commission directed the staff to explore enhancements to our engineering inspections with a goal of increasing the effectiveness of those inspections. Subsequently, we developed a temporary instruction to perform a series of four pilot inspections to assess our revised approach.

These inspections emphasize the use of PRA and design information to identify plant components for examination that are risk significant and that have relatively small design margins. Inspections also consider operating experience and human performance issues when picking inspection samples.

The inspection team consists of six or seven inspectors which include two or three contractors with practical experience in power plant design. The first pilot inspection was conducted at the Vermont Yankee facility in August of this year. This inspection resulted in eight findings all categorized as being of very low safety significance. However, four of the findings pertained to areas within the scope of the licensee's extended power uprate amendment request.

Consequently the licensee will need to submit to the staff their plans for corrective actions to address these issues prior to our approve of the power uprate. Two of the

findings were associated with generic issues that were previously closed out for Vermont Yankee. Overall, we are encouraged by our experience with the inspection at Vermont Yankee. Next slide please.

The second pilot inspection was conducted at the V C Summer facility and concluded in November. The results of that inspection have not yet been made public. The final two inspections will occur at Kawaunee and at Diablo Canyon both starting in January. At the completion of the four inspections, we will assess the results and consider feedback from the four regions prior to determining whether to implement this inspection on a permanent basis. This concludes my prepared remarks.

MR. DYER: Thank you, Stu. Commissioners, Chairman, this concludes my presentation on the reactor safety and licensing issues. We covered a lot of material in a short period of time. I'll turn it over to Luis now.

MR. REYES: Chairman and Commissioners, the staff is finished with its prepared remarks. We're still under the green light so we'd like to forward it to you for any questions.

COMMISSIONER McGAFFIGAN: For the record, 14 minutes and 20 seconds ahead of schedule.

MR. REYES: Close with the questions from Commissioners then.

MR. DYER: We could have gotten another speaker in here.

COMMISSIONER MERRIFIELD: No, no. We celebrate efficiency. That doesn't mean you have to stuff more in.

CHAIRMAN DIAZ: Thank you. I think this was very, very well orchestrated. I think you must have been practicing. I do appreciate the support materials that allow us to be able to follow this and with that, Commissioner Merrifield.

COMMISSIONER MERRIFIELD: I'd like to second that, Mr. Chairman. I thought

that the support materials were excellent and clearly meets I think the vision that we set for the staff last year of helping us become better prepared for the meeting.

I want to ask a clarifying question on grid reliability and that takes us to slide 16. Given our process which is quite detailed and knowing that to get a generic communication through, we're going to have to be in essence really starting to write it pretty close to now in order to get through concurrence in a time line that it would get it out to the licensees such that they'll be able to effectuate the changes before we get into the springtime when the very edge of some of those peak cooling issues start to play in. I'm just wondering are we there yet. Are we really working away at this so we can make sure that we're on this in a timely way?

MR. SHERON: Yes. We are working on this. As I said, we are considering a generic communication. Obviously we have to pick whether based on the significance it could be a RIS, it could be a generic letter. I'm not sure it rises to the level of a bulletin. I think there is staff here if you want to hear. They could probably give you a little more detail on the exact status of where they are if you'd like. Rich, do you want to?

COMMISSIONER MERRIFIELD: Briefly.

MR. BARRETT: I'm Richard Barrett with NRR staff. We're still in the process of going through the management approvals to determine what kind of a generic communication we want to put out. But bear in mind, there are a number of options here. One of them would be a RIS as Brian pointed out. A RIS is something that we could put out with relative speed.

Another option would be a generic letter. Generic letters take a long time to complete but throughout the process of developing a generic letter, interacting with the industry on the generic letter, putting it out for public comment, all of that becomes part of the resolution process and quite frequently leads to a satisfactory resolution before you actually publish the final generic letter.

COMMISSIONER MERRIFIELD: Thank you. Well, if we need to do it, so be it.

Getting on with our decision probably would be wise.

MR. REYES: Yes, I took notes of that and we have your challenge, Chairman, before the summer.

COMMISSIONER MERRIFIELD: In terms of the recent presentation we had from Stu Richards, you talked a little bit about the engineering pilot program and there's obviously more work to be done relative to V C Summer and the other pilot plants. But based on the preliminary work that we've done at Vermont Yankee where although we didn't have any risk significant issues, we did identify eight issues that fell in the green. Do we have any preliminary views as to whether there may be a need for a nexus between conducting this type of an engineering inspection and the power uprate efforts particularly with extended power uprates?

MR. RICHARDS: Commissioner, that was an issue that came up after the inspection was concluded because some of the findings were related to the power uprate. We've taken that as an issue we have to come to grips with but at this point we don't have any answers. We talked some with the power uprate group within NRR that's responsible for that. I'm sure as you're aware there's a lot of review that goes on internally. That's a normal part of the amendment process, but it's a good question and we need to come up with an answer. We just don't have that yet.

COMMISSIONER MERRIFIELD: Okay. Well, I look forward to seeing what the answer's going to be because it's obviously raised some questions and in one way or the other, we have to give a good answer to it. On slide 31, you talked about the work you have underway relative to the SDP. The note you have here is that right now we're running a timeliness of about 70 percent.

Now I understand there's a whole lot of, and you've explained, the variety of different reasons that go into that, some of which is because of the aggressive nature in which

licensees are challenging our initial finding. Some of it, sometimes the case is some of these things have fallen in our side of the house. I guess I'm interested in your thinking about the potential for doing a graded approach perhaps designing a time line for whether it was yellow or red findings.

But I think I was most interested in the quote. You talk about the fact that you were dealing with a situation in which degraded conditions were already addressed by the licensee and whether it's our fault or whether it's the licensee's fault or whether it's a little bit of both to the extent that there's a disjunct between the actual occurrence of the cause of the finding and the issuance of the finding, the longer that it attenuates, it would seem to me that the less effective our approach in actually trying to track our activities with the actual activities of the licensee. If we've gotten to a point through our actions or inactions or licensee's actions or inactions that that gets pushed out so far that there's a great deal of disconnect between those two.

I do challenge the staff and I recognize you're working hard to deal with this, but this is one I think is a gap. Let me put that into a question. Do you think that assigning specific time lines? You talk about some of the pluses from that. What are some of the minuses from putting in those, if any, specific time lines?

MR. RICHARDS: Well, as I mentioned before, the downside is accepting a less rigorous analysis and coming up with your initial determination that we provide for the licensee for their comment and then setting a specific time line for the licensee to get back to us. There may be some people who would argue that for some of these unique and challenging cases that's simply not enough time to do a very rigorous job.

I would argue that again what we're doing here is we're putting a historical perspective on something. It's happened. The licensee is going to fix it. We're going to inspect their follow-up. So we're really kind of putting a label on a finding for purposes of putting it into

the action matrix and determining our level of inspection at that site going forward.

For other reasons, the single white finding or of course the yellow or red finding has taken on a great deal significance for members of the industry and we can get into prolonged discussions about the analysis that goes into reaching those decisions if we allow it to occur. So I think if we truncate the process, we'll probably have members of the industry complaining that we haven't allowed them to do the research they may think is appropriate to provide us this official information.

MR. DYER: Commissioner, I think it also aligns well with our responsiveness. Our timeliness of our responsiveness is key to the color finding too.

COMMISSIONER MERRIFIELD: Right.

MR. DYER: A white finding is a pretty quick turnaround. It's less than a week's inspection. It's probably one inspector, one limited issue. A yellow issue requires an extended condition review on the part of the licensee and may have to prepare the regulatory conference and the meeting with us. So there is a bit of a lead time in all of this as we would go forward.

So our responsiveness in leaving these issues open, there is a time line before you close out the issue that currently exists now. So as far as responsiveness, now it's not a one size fits all. I wanted to talk generally about it because it came up in my appraisal on the lack of timeliness and that's when we started focusing on it.

MR. REYES: It's going to come up again if you don't fix it.

CHAIRMAN DIAZ: I just got some indication of what really, really counts.

MR. DYER: But we took a look at it and where we started off looking at this degradation as Stu said is the way we do risk analysis is one size fits all. Whether it's a licensing action that's going to live on for the life of the license or it's a quick turnaround, we still do a detailed analysis of it almost to the same thorough analysis and whether that's appropriate. When we went back and looked through the statistics, we would have met our timeliness metric

if we would have just delivered on time on all our white findings and let the yellow and red findings, the potential yellow and red findings that we dispositioned, if we stopped and just turn the clock off on those and dealt with them as the licensees had, I wouldn't have been explaining it to my boss and Luis as to what my corrective action program was going to be.

COMMISSIONER MERRIFIELD: I mean I hear you on that. I don't think that particular one makes me that warm and fuzzy. The bottom line of it is when we go out and we do our press release in terms of what happened and two years ago or however long ago we're making our finding now on something that happened a long time ago, I don't think that's where we need to be. So all kinds of efforts you can make to link this up, I think, is good.

I would say, and Madame Secretary, if you could note this for the SRM coming out of this meeting whether others support it or not, I haven't been updated in awhile in terms of SDPs that are greater than 180 days. I'd like to see a list of those and perhaps a rationale for why and where they are located and all that kind of stuff. I need to get better informed.

MR. DYER: By the way our graded approach was not going to be talking in years. I think you said one to two -

COMMISSIONER MERRIFIELD: No, I understand.

CHAIRMAN DIAZ: We're glad to know that.

MR. DYER: It was for 120 days tight time frame. We need to put much more discipline in the process.

COMMISSIONER MERRIFIELD: Right.

MR. REYES: It is complicated. There's more than one dimension to the problem. When you get the information you ask about the ones that are taking a long time, you'll find out that both the technology and the practitioners from both sides, industry and regulator, on such things as mitigating systems are well developed. We have used it for many years. It doesn't take that long of time.

When you get into new areas like fire protection or metallurgical issues, now you'll see in that character. So I think we need to step back and take a hard look at the findings and make sure we give the licensees some fair time and the staff some fair time to deal with them. In addition to that, it has to be timely. So I mean we are attacking the problem. We understand the issue. We don't want to give it a short amount of attention or effort. We need to solve it right I guess is my point.

COMMISSIONER MERRIFIELD: Okay. That's perfectly valid. Your comment segues into my next question. You talked about our great understanding of mitigating systems. On slide 29, we had a one year pilot of the MSPI that was completed in early 2004. Our target implementation date for that is early 2006. I'm wondering. I mean you've explained a little bit of the workshops. I still don't quite understand why we couldn't have done it a bit quicker. So I'm wondering if you could shed a little bit more light on that one.

MR. RICHARDS: Certainly. It's a complex PI. It is not simply something that you count and it's reflected in the time it's going to take to set up. Most of it is driven by activities that the industry has to undertake. Once we have come to an agreement on the implementation guidance which is fairly extensive and on the PRA content requirements, then the industry has to have the first workshop where they are going to explain MSPI to the rest of the industry and they are going to explain to the industry what their PRA has to do to basically get in the game and they are going to tell them how to go back and set it up which is a significant amount of work.

I believe that for some licensees there's going to be considerable amount of work to do on their PRAs. Once they've completed all that, then they'll come back for a second workshop and the industry anticipates that the various types of plants will get together and share results and the idea would be to see who's an outlier and why. Let's all understand why our risk values for various components are the same or different.

Then they anticipate a third workshop as kind of a clean up for those questions that come out of number two that can't be answered. They have to schedule their workshops around other demands within the industry primarily outage planning. So when you put it all into a flow chart, they agreed and we agreed, that the best we can do right now is the first quarter of calendar year 2006 and that data won't actually be reported out until April of 2006.

COMMISSIONER MERRIFIELD: All right. Okay. I know it's hard and I appreciate the staff's hard work on trying to make it happen. In my 30 seconds left, on Appendix R, it's been a long time coming. I know the staff has worked very hard. We worked with a variety of industry stakeholders. You said, John, we'll be accepting applications this summer or something along those lines. How many do we expect to get?

MR. HANNON: It's hard to answer that question looking for total numbers. What we do know is one utility has already engaged with us. We had a meeting last week with them and we recognize that they are going to be the first applicant to transition to 805. They already explained that they are going to do that to the EDO.

MR. REYES: I've been informed that there are several utilities that are interested in it. One of the concerns is that once they go into the program the actual physical changes to the plant are going to have to be implemented during refueling outages and they are interested in making sure that we can properly provide discretionary enforcement. Simply there's a time lag even if you decide to do it and we're coming forward to the Commission to clarify the guidance that we got from you. But there's a increasing number of utilities who are telling us that they are moving forward.

COMMISSIONER MERRIFIELD: Well, I appreciate that and I think that makes sense. This is an important risk informed effort that took a lot of sweat equity and it would certainly be a shame if we didn't get a decent yield out of it. Hopefully, we'll see the applications come swarming in in the summertime. Thank you, Mr. Chairman.

CHAIRMAN DIAZ: Thank you, Commissioner Merrifield. I think that covers Mr. Richards who has already been drilled on. So I'm not going to drill you. I'm going to start with Dr. Sheron. The issue of the license renewal, during the Dresden and Quad Cities license renewal, ACRS raised the issue of getting operating experience for all of these issues and yesterday we saw the issue of operating experience coming out from the Lessons Learned Task Force.

So here we go and we have issues in this field and issues in the other fields. How are we putting these things together in the manner that the staff can get the proper guidance about how to deal with these issues and how are we going to deal in the different spaces, both license space and actually inspection space, so that operating experience plays its proper role in the assessment of the issues of both when we're doing license renewal and then when they get to the operating stage? How are those things being put together?

DR. SHERON: Well, I'll try and answer. I think maybe Jim may want to add too because I think he spoke a little bit to this yesterday.

CHAIRMAN DIAZ: Yes, he did.

DR. SHERON: And that is with the operating experience database that we're putting together such that the staff will have much more access to it and as a matter of fact, we were discussing this this morning where you'll note for example on the medium voltage cables. That was an issues that came out of operating experience which we're very happy about that it's something that we're trying to nip in the bud.

What we'd like to do, at least I would like to do personally, is to have the staff better trained in using these new tools, these computerized tools that we have, such that I think as Jim said that it will come to a point where when new events come up certain staff members that are interested in this, this will actually come to them as an e-mail alerting them of new operating experience. So I would hope that we will get in a formalized manner various staff

members actually, I might say subscribing to this, so that they are kept constantly aware of new operating experience in their areas of expertise with almost a requirement that they have to keep tabs on that, monitor it and decide if there's anything generic that needs to be followed up before it becomes a significant issue. We have some more work to do in that area. I have to talk with my staff on that. But that's my thoughts on how I would approach it.

MR. DYER: Chairman, I think to address your question specifically to the license renewal program as ACRS did and Dave Matthews can explain in more detail if I stumble here, but one of the things I said, the three points in my opening remarks, is we need to continue to update the GALL reports, or generic aging lesson learned reports, and our review standards for the license renewal.

License renewal, the overall program, is every one is a lessons learned for both the industry and us. There is the steering groups and the exchanges of information that go on that way. One of the challenges we have right now is keeping the guidance documents whether it's GALL or Standard Review Plan and that up to date. It's almost a continuous change process. That's the vehicle by which I think we want to factor in this operating experience, if you would, as well as it's a batch process right now. It's not a continuous function.

MR. MATTHEWS: I would like to add one thing to that, Jim, and that is that first of all when these issue arise, our first concern is the status and safety of the operating plants whether they've received a renewed license or not. So we first looked at the short term safety implications.

With regard to the implications on the license renewal process, we've developed an agreed-upon process among ourselves, the industry, the ACRS and yourselves of issuing in very short term something called "interim staff guidance." The industry has agreed to follow that interim staff guidance and you've agreed to support it even though ultimately it will be rolled into an update of the formal GALL process and we will go through the CRGR review, the public

notice and comment and resolution before it's documented in the NUREG reports.

In the meantime, every on-going license renewal review, we issue an interim staff guidance document which will bring forward into the license renewal process the outcome of the operating reactor experience in a very short order. That way we ensure that we don't have a lot of, what would you call it, hanging shads with regard to license renewal.

CHAIRMAN DIAZ: You didn't bring Florida into it.

MR. MATTHEWS: No, I'm sorry. I knew that as soon as it got to the back of my teeth that that probably was a bad choice. But anyway, that's how we do it. It's been working very well and the industry has been agreeing to it as a good way to resolve the issue of moving forward with license renewal while an operating reactor safety issue is being resolved by the technical staff. Fortunately or unfortunately, depending upon the resource limitations, the same staff and management that looks at these day-to-day operational issues and operating experience issues are the technical reviewers who also have license renewal as some of their collateral duties.

MR. REYES: What I was going to add was that the short answer is that we need to institutionalize in our process the operating experience and let me give you a simple example. Before we had GALL, the way we handled the issue of buried cables and in fact that issue was already being reviewed during license renewal in the early license renewal inspections and it was an informal process that the inspectors who were doing that were told about the buried cable. As it gets institutionalized in a GALL report, that's how you forward that issue for future generations and future license renewal. But then you have a dual loop because as Dave stated, every time you do one, you may find a new issue that needs to be considered on the next one. That's why Jim is saying that we need to get revisions to the document because that's how you institutionalize the operating experience into certain reviews.

CHAIRMAN DIAZ: All right. Thank you. Going to power rate, I think, Dr.

Sheron, you mentioned that you understand that Brown's Ferry is not going to be considering the power uprate at the same time that they're doing the license and the reason is uncertainties with the power uprate. Is that correct?

DR. SHERON: Yes.

MR. REYES: It's a resources issue. They tried to do recovery of unit 1, do license renewal and power uprate all at the same time. Due to the issues that have surfaced on power uprate, they have decided to decouple the effort and prioritize them in terms of what the company priorities are.

CHAIRMAN DIAZ: Okay.

MR. DYER: Chairman, I made the comment and Luis is right. When you come in for a license renewal, you have to come in at a power. A lot of these licensees that are considering power uprates parallel path with their license renewal at one point Brown's Ferry's license renewal was thought to be done ahead, their power uprate was thought to be done ahead, so their license renewal would have been at the uprated power. Now they've had to shift it around.

CHAIRMAN DIAZ: Now on the issue of power rate, it seems to me like in a certain way we're now faced with what are obvious in the time dependent scale relatively short term effects. We have seen obvious reasons to be concerned with the increasing steam flow, the increase feed water flow, the potential acoustic phenomena and so forth. However, there is an issue here that might be in the longer term. What are we going to do to ensure that there's some monitoring, some capabilities to follow the longer term effects of the extended power uprates on these units?

DR. SHERON: Well, one is again monitoring operating experience, but since obviously this is an issue that’s right on our front burner, we will be paying attention to those plants that have particularly seen this problem, those with the square hood probably with much

more rigor than we would normally in the sense of we would probably be very interested every time they went into an outage and did an inspection to find out what they found during the inspection and so forth.

Hopefully, you know this is just personal, but I mean down the road, I would hope that some of these plants with the square hood dryers if they can't either get this issue behind them and resolved, they would consider replacing those steam dryers at some point with an improved design so that it would just eliminate the issue.

MR. REYES: But the final answer because one of the problems the staff is having is that the prediction tools of the supplier of GE has not given the staff a comfort factor that is accurate and the reason is that we continue to see the phenomenon occur again. A licensee, one utility, who is suffering this particular problem, is doing a lot of engineering analysis and they are not getting to the conclusion of what it is. So just replacing the dryer may solve your current problem but not the long term problem. So the final solution is they're instrumenting the dryers –

CHAIRMAN DIAZ: One dryer has been.

MR. REYES: To try to take the models that are not being as accurate as they should be and understand why and we know it's a combination of smaller steam lines which is higher flows like Dr. Sheron said. But exactly what's causing the failure is not understood. But until you have that tool of prediction, I don't think we will be able to answer long term.

CHAIRMAN DIAZ: Okay. But this is because this involved the vendors and the licensee. Obviously, we need to engage them in the longer term look of why these are happening so we can be assured that there are no effects that could be creeping in into this standard uprates that will come out to bite us. So that's what I was trying to say. It's not only us. We need to get them fully engaged in this.

DR. SHERON: Yes. One area that we're looking at right now for example is the

way one of the things that manifests itself when you get a crack in the dryer, not all the time but some of the time, is increased moisture carryover. So the question is we look at what are the licensees' procedures if they see increased moisture carryover.

Should they for example start a controlled shutdown? Should they monitor it? What kind of verification do they need? How far do they let this go before they actually take some action? Those are things that we need to take a really hard look at because again it's more of a, I call it, more holistic approach rather than saying I'm just going to be able to put all my eggs and begin to analyze this and hopefully I can do it accurately, which I don't think we're ever going to get there because the way these dryers are constructed there are a lot of fit-up stresses and so forth. I mean they push them into place and everything. So you get residual stresses that they just don't know are in there. So when they are trying to do the calculations, and this is not unique to the dryers. We find this in a lot of components.

CHAIRMAN DIAZ: That's what I was going to say. You can't be looking at the dryers.

DR. SHERON: Exactly. So you want to look at a more holistic which is what other compensatory measures and I think I had mentioned that in my presentation. For example, you may want for some plants that are just starting up again, for example, at uprated power to do a mid-cycle inspection just to confirm that they are not getting any cracks or you may want them to do more thorough inspections when they do shut down and do an inspection besides just a visual and you may want to have them have better monitoring and procedures for when they do see indications that something is amiss in the dryer.

MR. DYER: Mr. Chairman, I was going to say. That was the first topic on yesterday's public meeting with the BWR Executive Group.

CHAIRMAN DIAZ: All right. Let me just a little bit of time on one of my favorite topics and that's not a good statement. It's fire protection. It's just a thing that Commissioner

McGaffigan owes half of his gray hairs to fire protection. Of course, I was too young to get gray hairs, but Commissioner Merrifield keeps complaining about the fact that I don't complain. I like to see it close.

Fire protection of course you know we made some improvements and I guess we're getting to do some closure. Still I am concerned that we are not addressing or we're not managing the entire problem of fire protection from the standpoint of when we do the oversight the plant specific all the way up or how we deal with it in, I call it from headquarters or from the actual rulemaking. We're going to have these problems again.

Some people are going to accept the new way and some are not. We're going to have tremendous amounts of differences between how the licensees deal with this. And that really is a problem. It's a problem for them. It's a problem for us. It continues to consume an enormous amount of resources.

So I'm still looking for creative regulatory thinking that tries to level this playing field in how licensees deal with it, realizing that they are different plants with different fire protection systems and with different things and how we deal with it. I'm not sure that we're there. If we are there, I would like to know. But I still see this difference in here.

So I'm pleased that we're getting to some stage, but I still think that this is one of the issues that really needs a significant amount of attention. It's coming back not only in this area of every day operations, but of course, it's coming out now in the security arena and how you deal with a fire. You have different things. So I still think that again just like we need to do with this a global, better integrated look at how we deal with fire protection in a manner that enhances the protection of the people, in a manner that we can deal with it with good regulatory sound practices and that the licensees at the same time can implement and operate within those framework constraints and realizing that they've been trying to deal with it for some time, I think it's an important issue. I'm not giving up on fire protection. I might resurrect it next year or

sometime and get a fire protection three day meeting in here.

COMMISSIONER McGAFFIGAN: That will be a chairman only meeting.

CHAIRMAN DIAZ: Yes. Chairman only meeting. Whatever. I don't want to get rid of the problem. I want to solve the problem. But I just want to tell you that I still get this, it's not a feeling, it's the impression that we're progressing but we're not getting right where we are. Would anybody care to comment about that?

COMMISSIONER MERRIFIELD: Can I jump in for a second?

CHAIRMAN DIAZ: Yes.

COMMISSIONER MERRIFIELD: I just want to by way of my own personal clarification on the matter of making sure that we have the right baseline in protection of health and safety, and even-handedness, I absolutely agree with you. The only nuance I think is that entering into this as is the case with most of our risk informed initiatives I think we recognize that the risk informed option was in fact an option. I think going into that we recognize that there would be differences from our traditional framework and from the new framework in a risk informed approach. I didn't think that was what you meant but I for those who aren't as familiar with the details of it I just wanted to make sure that that was clear. I think we all recognize that there are going to be differences.

CHAIRMAN DIAZ: Right. There are significant differences.

MR. HANNON: Well, to follow on that thought, I will agree that we are still not out of the woods in terms of setting the stage for the implementation of NFPA 805. We still have to work through the issue of how we inspect, once the plant has made a transition and fully implemented the new risk informed performance based techniques because this as you know is the first time the Agency would have had a regulatory scheme that's purely based on a risk evaluation. So we have yet to develop the inspection tools that we would use for monitoring the implementation. That's still a challenge for us.

As far as the continuation of the two regimes, one in the deterministic space and one in the risk informed area, our attempt is try to be definitive. I think what the stakeholders want is clarity and that's what's driving a lot of our effort now is to try to specify what the expectations are. They may not like it but we need to pin it down so people understand where they stand in terms of the licensing basis. That's our major effort to try to move forward in the deterministic area.

MR. DYER: Mr. Chairman, any time I speak to utility executives about this subject and I see a success path through the NFPA 805 risk informed rebaselining, if you would, of the fire protection and licensing basis. It is what's stopping you. Is there anything I can do and we talked about the enforcement discretion. They didn't want to get halfway into it. Fine. We can work with that. If there's other questions or we need more dialogue or better tools, we need to pursue it.

MR. REYES: Yes, and every time we move into the clarity area we get more and more feedback of good sized utilities that are going to make the decision to get to 805. So I think we have the charter to clarify all the issues that John was talking about. So the utilities can then make a clear decision. They have to make a clear business decision. So we owe clarity on that.

CHAIRMAN DIAZ: All right. Well, thank you very much. Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: I'm going to change the order of some of my questions. Just on fire protection, one of the slides said that we had a new SDP for fire protection. Has that improved the timeliness of fire protection SDP determinations at all? At one point when I was looking at the data earlier this year, it looked like the expected time for an SDP determination with regard to a fire issue might be infinite. It certainly wasn't 90 days, but the data was consistent with infinity. Has that improved?

MR. HANNON: Let me speak to the potential improvement. What it has done is provide a screening process to allow us to determine what issues we don't need to worry about. So in that sense, it has helped. It may have been incremental on the infinity.

COMMISSIONER McGAFFIGAN: Well, I remember I also happen to have it periodic with Sam Collins earlier last year, just after he came out of a meeting, I think Luis may have been in it, because it was a Region 2 archaic case –

MR. REYES: Yes. I remember it well.

COMMISSIONER McGAFFIGAN: -- where the staff had pretty much, he was sort of mad at his own staff because they had been pretty much blown out of the water by the licensee and convinced him that these things were all trivial at least that day. I don't know whether he ever managed to re-convince Sam, but it just struck me that gosh, this stuff is just –

MR. REYES: It is still the most complicated SDP that we have. The larger volume and the most complicated we have. It's an improvement in that before we didn't have, as we're publicly approaching infinity where now we're a little bit less than that. But it's still the biggest issue we have in terms of –

COMMISSIONER McGAFFIGAN: Okay. That's one area where I think if you can make progress it would be useful. I understand it's complicated and the created approach that I think Mr. Richards was talking about obviously fire would be one of the things that are longer. But let me switch over to the issue of timeliness. I may have a slightly different approach from Commissioner Merrifield. We've talked about this before, but it may not be. The timeliness, the licensee incentive to combat greater than green SDP findings is built into our system.

I know the staff last year as the results of an SRM looked at whether we should go to three rather than two whites hoping that that would take the pressure off the first one and you came back and said "No, no, two is the right number", and so be it. But the reason that

even white things get fought is that if you have white or the prospective of a white PI or something in that cornerstone, then the second one brings in all these additional things. The issue of degraded cornerstone gives you – so the incentives that we have in the system at the moment are to fight us even on white and it really leads to different outcomes.

The red and yellow are the most important ones and there's this issue that was talked about some time again when Chairman Meserve was here under-calls and over-calls. We had the famous D.C. Cook potential red finding that turned – that I talked to Jim Dyer about a few times – it turned out to be white. I think we called it yellow and then it ended up white and then the licensee sent us a letter saying we're not going to fight you but the staff is wrong and it really is green. That was the end of that.

Then we had the famous Davis-Basse red finding that took the staff a very long time to figure out was red although to give some senior staff credit they figured it out that it was red pretty quickly but it took awhile for the methodology to catch up. Of course, we looked good today that we didn't put out a green finding before the hole in the head when we're also saying it's a significant precursor, the most significant we've had in many years.

So I think you do need the graded approach and timeliness isn't everything. If it really is yellow or red, they need more time. If it's the second, wait, they might need more time because it does lead to expenditure of our resources and I don't know what the numbers should be. But I look forward to seeing what you come up with in the way of a graded approach.

One thing on power uprates, switch to Brian, that we didn't discuss today and I'm just interested. It's not on the agenda really but I assume you're up-to-date on it because there was something in “Inside NRC” or "Nucleonics Week" recently with staff comments. The issue for measurement uncertainty power uprates, the flow meters and whether you have to issue a generic communication to everybody who uses both leading edge and cross flow meters and the strong dissents within the staff that were heard at an ACRS meeting.

I happened to sit down with Mr. Bonaca and Mr. Wallis at lunch that day and they were not totally happy campers as you can imagine. This was back during the summer, but are we headed towards a resolution there and hopefully it doesn't involve the leading edge flow meter any longer. I mean there's no problem there. We've never had a problem. Where are you?

DR. SHERON: Well, we are heading towards a resolution on this. We're just basically trying to get everybody on the same page. There are still differences of opinion among the staff. I think I can tell you right now, and I think most people would agree, that this is not any kind of a safety issue whatsoever.

COMMISSIONER McGAFFIGAN: There's no safety issue. Yes.

DR. SHERON: The other thing is that both of the flow meters that are in question, the Westinghouse one as well as the Caldron one, I think it's fair to say that we believe both of them are capable of accurate measurement of the flow and therefore power. The real question that comes about is have they been installed properly and have they been calibrated properly.

MR. REYES: That was in the details of the field.

COMMISSIONER McGAFFIGAN: And it's a lot easier or at least there's far less problem with the leading edge flow meter. What's the company's name?

DR. SHERON: Caldron.

COMMISSIONER McGAFFIGAN: Caldron. There seems to have been a lot more problem with the cross flow where you're just trying to strap it on the pipes and get readings and it's a more complicated methodology. It just struck me based on what I heard at the time of this debate of the staff and what I read in the "Inside NRC" or whichever publication, Westinghouse continues to befuddle you a little bit and the other manufacturer seems to have answered the staff's questions. At least I hope that's the case.

The GSI-191, you all put out the SER early this week. It relates to the draft last week. Had a very strong ACRS letter from October on November 26th. Have you had any discussion with ACRS about your response to their letter. They sent a very strong letter with very strong adjectives in it and lots of points and I'd interpret your response to them as saying "Thank you very much for your views, but we're proceeding at pace and not really going to make very many changes in the SER, safety evaluation."

Where do you stand? It makes me uncomfortable a little bit. I mean if I have to choose between Graham Wallis and the staff about thermal hydraulics, I'm not sure where I'd go.

DR. SHERON: Let me if I could and I'll ask maybe John Hannon if he wants to jump in, but when we got the ACRS letter, I was obviously concerned too when I saw the concerns and what I instructed my staff to do, and they engaged the Office of Research to assist them, was I said, "I want a fair and honest evaluation of each one of the ACRS's issues." It may very well be a legitimate issue in terms of for example whether there's a large uncertainty or not.

But the decision we have to make is this, let me call it fatal to our ability to go forward and resolve the issue? Can we afford to wait to get for example a lot more data and try to resolve the issue from the standpoint of is that information absolutely necessary for licensees to be able to go forward and start to assess their sumps?

We didn't deny that there are some issues and that some of that information it would be very useful to have either to confirm that the approach that the staff was using was in fact conservative or conservative enough or that the uncertainties where not excessive. So each one of those issues was carefully evaluated by the staff.

COMMISSIONER McGAFFIGAN: Have you heard anything from ACRS about your response yet?

DR. SHERON: I'm not aware of any, but, John, maybe you've had some interaction.

MR. HANNON: No, but I just want to make sure it's clear that we did modify the safety evaluation in response to the concerns raised by the ACRS. For example, on the 6224 correlations, we specified that it could only be used for scooping purposes for cal sil, that type of debris, and for latent debris and the burden's on the industry and the vendors to show that their head loss calculations are correct when they modify the sumps.

COMMISSIONER McGAFFIGAN: In reading the ACRS letter and your response and some of the additional views in the ACRS letter, there is clearly a concern that we're going to do something and then it's going to get overtaken with these enormous uncertainties and then it could get overtaken and then you'd have a second backfit some three or four years from now.

So how much of this is we've been pressuring you to get GSI-191 resolved? We get a lot of external stakeholder desire on that, 2.206 petitions and all that, but how much of this is to meet a schedule and how much of it is – how concerned are you that this will end up a two-step process where you make a change?

I was reading another document recently that ACRS had put together about our comparisons with other international folks and they mentioned Framatome, of course, is proceeding a pace trying to come up with a solution and IPSN is looking at it, but that there might be a two-step process there too because they are working like us with enormous uncertainties about the phenomenon. So a fundamental issue is should we take a little bit of extra time and tie some of these things down or is that so much extra time we'd be better off with risking the potential for one fix and then another fix?

DR. SHERON: Well, I think that if we tried to resolve all of the issues and wait for all of the information to come in, it would probably be an excessive amount of time. I feel

comfortable in the sense that first I understand from some of the meetings we've had with some of the vendors that are proposing designs to fix the sumps that they are making these designs in a very robust manner to try and make sure that they're encompassing a lot of these uncertainties. There's a lot of margin there.

COMMISSIONER McGAFFIGAN: The only one that's acted so far, Davis-Basse, has enormous margin in what they did.

MR. REYES: What I was going to say was the ACRS brought up a lot of good issues about precision in getting to the answer. But what's happened out there in the real world is that the utilities are saying we have a lot of margins in everything else we design and we're going to do the same thing with the sump screen.

COMMISSIONER McGAFFIGAN: But that may be the solution.

MR. REYES: And they are designing super, behind the screens is not a problem. What we're seeing out there is designs as we speak that may not be an elegant calculation but it's so obviously over designed.

COMMISSIONER McGAFFIGAN: There's so much margin that they'll take the risk of the second step in the process.

MR. REYES: So I don't think that we're going to have a lot of double around the issue.

MR. HANNON: let me add just to be clear. There is one wild card in this and that's the chemical effects testing. We have to be flexible if that turns out to go south. We may have to go back and look at the schedule, but right now, we don't have any reason to need to do that.

MR. REYES: But on the chemical effects if you look at the two events we have had in this country where the containment was flooded because of a loss of coolant accident, those events did not result in this gelling and because there was some agitation. So even if you

do the sump screens and all that and then you find out that you have a potential for long-term gel, all you need is to find a way to agitate it and you'll solve it. So I don't personally think that's an insurmountable, technical issue.

They may have to do a second go-around and provide some sort of screen wash, but the real live examples we have when Robinson had the reactor coolant pump seal failure and of course, when TMI happened, there was a lot of water in the containment for a lot of time and we never saw the gelling. So I think in theory it could happen, but in the time frames we're talking about I would be very surprised if in the time frames we're talking about that you'll have that problem. If you do, you can agitate it and solve it.

COMMISSIONER MERRIFIELD: Just a clarification on that note, my understanding in terms of some of my discussions is that not only is the matter of licensees going ahead and redesigning the systems, but also in terms of the processes of back-flushing and how they would accommodate those issues. Many of them are well along the way there too. Is that correct?

MR. REYES: Yes, that is correct. In fact, there was a recent workshop and there were so many vendors selling so many solutions. It may not be precise. There may be some uncertainties. But when you step back and look at the whole solution, I think we feel fairly comfortable that this won't be a several time interaction.

DR. SHERON: The other thing is that we are getting or will be getting data from the experimental programs that research is running, I think, in the spring. And so if there is anything that indicates as John said that there's a showstopper here, we can always go back and revisit the schedules with the industry without really impacting the hardware design you might say.

MR. MAYFIELD: If I could just add one thing. The concern that was raised about the head loss correlations, staff and Research has looked at those, the thermo-hydraulics

folks, and I saw a draft report literally this morning that lays out a revision of those head loss correlations that once we got –

COMMISSIONER MERRIFIELD: Mike, do you want to get that microphone so there's no feedback.

MR. MAYFIELD: We have a draft of a revised head loss correlation and once that goes through some internal review that will be available. So we can deal with the CARS issue on that one. The chemical effects results, we're not having to wait until spring. That's coming out real fine. These are 30 days runs so it takes some amount of time just to get anything useful. But we're getting that in real time so we don't have to wait until the end and we're engaged with the international community where similar tests are being run and have been run in recent history and we're able to factor that information in at least qualitatively at this time. So there's work going on that's in process that coming out to support meeting the generic letter schedule.

COMMISSIONER McGAFFIGAN: My final question or comment, and I don't want to take much more time, when we got a paper really last month, 04-0210, about the ASP program and the SPAR model development and it did find that there were some within, there's no overall trend in precursors, but they did find that for certain bins of precursors or certain types of events like loss of offsite power events that there seemed to statistically significant trends, some of them favorable, some of them for the 10^{-6} precursors unfavorable and for loss of offsite power events, initiating events, unfavorable. Usually in the past when I guess we come into the AARM, you look at all the stuff, not just the PIs that we follow on our web page.

MR. RICHARDS: Right. Typically we'll get all that information by the end of the year and present it at the AARM and then to the Commission.

COMMISSIONER McGAFFIGAN: But I don't know what. They are just finding statistical significance in both directions in some of these cases and I urge you to maybe come

to the AARM to keep us up to date on that.

MR. RICHARDS: Will do.

CHAIRMAN DIAZ: All right. Thank you so very much. I thought it was an interesting afternoon. I want to thank the staff for their efforts. I know all of these things require a tremendous amount of your time. We appreciate you putting it together. I think that we'll meet in the spring again sometime and we will revisit some of these issues. I do intend to do something special regarding fire protection even if I have to do it out there on the green by myself.

COMMISSIONER McGAFFIGAN: You could try to get one SDP finished so we could get the asymptotic infinity disappears.

CHAIRMAN DIAZ: If my fellow Commissioners don't have any additional comments, thank you again. We're adjourned.

(Whereupon, the above-entitled matter concluded.)