St. Lucie Plant Radiation Safety Excellence Program

Presentation for NRC Region II

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Atlanta, Georgia

Enclosure 2

Introduction

To Provide A Status On The Radiological Events During SL1-18 And Progress Of Radiation Safety Program Improvements

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Radiation Safety Conditions Prior to SL1-18

POSITIVE ATTRIBUTES

- Top quartile ALARA performance
- Good recent outage performance
- Implemented lessons learned from Davis Besse radiological event
- Pre-planned first time evolutions; Rx Head decon, Rx Head inspection

NEGATIVE ATTRIBUTES

- Radiation Protection personnel did not properly use the Condition Report process to identify low threshold events
- Little benchmarking and few self-assessments
- Low turnover in RP staff
- Internal and external assessments failed to detect declining trend
- Weak procedures for response to off-normal radiological conditions

SL1-18 Radiological Events

- **Reactor Head Decontamination**
  - 33 unplanned uptakes
- **Incore Detector Removal**
  - Created unplanned locked high radiation area
- **2 Instance of Radioactive Material Outside the Protected Area**
- **These Events Resulted in Significant Media Exposure**

Regulatory Response

- **Three Green NCV - Occupational Exposure Cornerstone**
  - Failure to follow procedures for control of access to HRA, airborne areas, LHRA
  - Failure to follow procedures to survey personnel (extremity monitoring, DRP monitoring)
  - Several examples of failure to follow procedures for posting areas (HRA, radiation area, airborne areas)

Regulatory Response
(continued)

- **Two Green NCV in Public Exposure Cornerstone**
  - Failure to follow procedures for personnel monitoring (release of material offsite)
  - Failure to have adequate procedures for surveys (release of material offsite)
- **Occupational Exposure Performance Indicator Occurrence (failure to control access to LHRA). FAQ submitted for clarification**

Organization Effectiveness

- **Weak Leadership Within the RP Organization**
  - Untimely resolution of contractor issues
  - Did not use Condition Report process
  - Poor decision making
    - Lower cavity event, modesty garments, release of contaminated individuals
  - Poor outage planning
    - Lack of execution, lack of consumables, ICI removal, head decon, facilities preparedness
  - Low Radiation Protection standards
    - Personnel decon with non-approved materials
    - Poor work practices not addressed

Organization Effectiveness
(continued)

- **Weak ALARA Review Board Process**
  - Reluctance of organization to strive for top dose
- **Weak Oversight of RP Contractors**
  - Poor communications
  - Late ramp-up resulted in less training. Technicians lacked site specific orientation
  - Low returnee rate
  - Failed to address technician concerns early in the outage. Most concerns were validated
  - Poor contract supervision personnel

Improving Performance With A Three Pronged Attack

- **Personnel Performance Improvements**
  - Training
  - Field monitoring and coaching
  - Control of contractors
- **Process Improvements**
  - Radiation Protection, Maintenance and Ops procedure improvements
- **Facilities (Plant) Improvements**
  - Instrumentation, control points

Personnel

- **Training Improvements**
  - Enhanced Radiation Worker Training: 2 day hands-on to include practical factors
  - Contractor Training: early outage ramp-up, provide JIT and site specific plans. Increased number of authorized contractors
  - RP Staff training (OJT and TPE for process improvements). JIT (outage lessons learned) during 1st quarter

Personnel *(continued)*

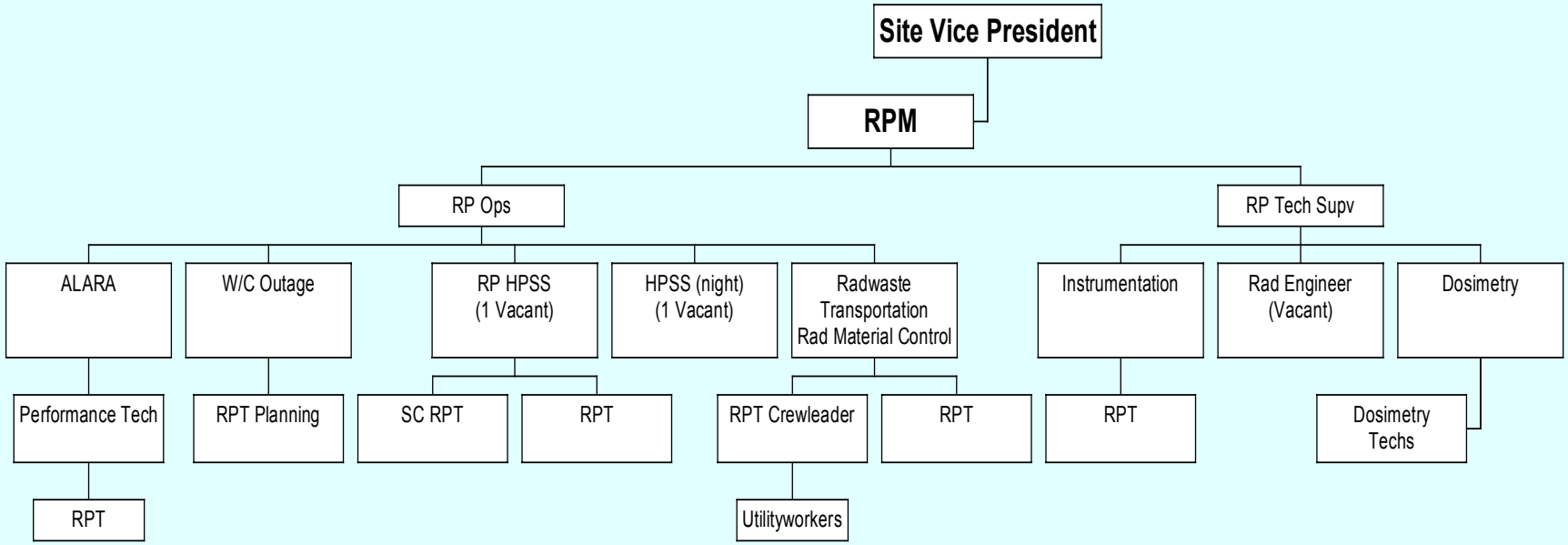
- **Clarification of Roles and Responsibilities in Radiation Safety for Radiation Workers and RP Personnel**
- **OCC Roles and Responsibilities Have Been Clarified Including Communications Protocol**
- **RP Staff Stop Work Authority Emphasized in Training and Through Field Coaching**
  - RP Supervisors performing daily field technician performance management
  - Use of radiological restriction process for poor performance in the RCA. Involving line organization in process
  - Focus staff on radiation safety first (include job-site setup, pre-job briefings)

Personnel *(continued)*

- **Organizational Changes**
- **RPM is Now a Direct Report to the Site Vice President**
  - Increase Radiation Protection participation in FRG and CROG (highly visible program at PSL)
  - Increased RP staff - new senior RP position to provide oversight of RP operational personnel.
  - Dedicated individuals for outage planning and execution

Personnel *(continued)*

Health Physics Organization



Personnel *(continued)*

- **Contract Technicians**
  - Fully staffed for SL2-14 RFO
  - 79% are FPL returnees
  - 85% > 5 years senior RP experience
  - Outage staffing ramp
    - 5 weeks prior for supervisors
    - 2 weeks prior of RP technicians
  - All will attend Enhanced Radiation Worker Training
  - JIT training on outage events

Process Improvements

- **Radioactive Material Controls**
  - Independent verification for release of materials
  - Protected Area material controls strengthened. Survey or evaluation required for protected area material release
- **Access To and Control of Work in HRA. Clearly Defined Access Requirements, Clarified Use of Boundaries and Barricades**
- **ALARA Review Board is Chaired By the Site VP With Greater Focus on High Risk Evolutions Together With Collective Dose Jobs.**

Process Improvements *(continued)*

- **Release of Personnel from the RCA and the PA**
  - Independent verification for release of personnel alarming monitors
  - New control point facilities including “decon brigade”
  - Flow chart developed for all contamination events
- **Control Point Dosimeter Alarm Response Strengthened**
- **ALARA Review Board Greater Focus on High Risk Evolutions**
  - Low collective dose together with a lower collective dose estimates (0.200 Rem task reviews)
- **Release of Materials from the Protected Area**
  - All material requires survey or evaluation

Process Improvements *(continued)*

- **Radiation Protection Outage Plan Developed**
  - RP outage organization
  - Responsibilities and functions of the various RP staff positions
  - Work scope overview and detailed radiological controls
  - Specific area posting and barricade plan
  - Supply matrix with quantities and locations
  - Containment instrumentation logistics

Process Improvements *(continued)*

Added RP Hold Points To Risk Significant Procedures

Procedure Number	Title
2-M-0036	Reactor Vessel Maintenance – Sequence of Operations
1-M-0015	Reactor Vessel Maintenance – Sequence of Operations
1-MMP-06.02	Radioactive Filter Cartridge Replacement
2-MMP-06.02	Radioactive Filter Cartridge Replacement
1-MMP-08.03	Providing Access To The Unit 1 Steam Generator Secondary Side
2-MMP-08.03	Providing Access To The Unit 2 Steam Generator Secondary Side

Process Improvements *(continued)*

Added RP Hold Points To Risk Significant Procedures

Procedure Number	Title
M-0045	Remove and Replace Core Support Barrel
M-0922	Removal Of Irradiated Components (Incore Detectors) From The Spent Fuel Pools For Disposal
2-MMP-01.01	Pressurizer Heater Replacement
1-IMP-65.03	Incore Instrumentation Outage Tasks
2-IMP-06.03	Incore Instrumentation Outage Tasks
1-1400191	Heated Junction Thermocouple (HJTC) Replacement

Process Improvements *(continued)*

Added RP Hold Points To Risk Significant Procedures

Procedure Number	Title
2-NOP-02.02	Charging And Letdown
1-NOP-02.03	Charging and Letdown
HPP-1	Radiation Work Permits
2-MMP-01.05	Unit 2 Steam Generator Primary Side Maintenance
1-MMP-01.05	Unit 1 Steam Generator Primary Side Maintenance

Process Improvements *(continued)*

- **Strengthened Surveillance of Material Leaving the Protected Area**
  - Non-personal items leaving the Protected Area require a gate pass. RP evaluates each gate pass to determine if survey of material is required
  - RP searches vehicles leaving site and performs surveys as appropriate using uR/hr meter and beta scintillation detector

Plant Improvements

- **Control Points**
- **Locker Room and Personnel Decon Facility Upgrades Including Gender Specific Improvements.**
- **Protective Clothing Improvements**
  - Single use PCs (heat stress mitigation, eliminate large number of particle contamination events)
- **Operation Clean Sweep**

Plant Improvements *(continued)*

- **Portal Monitors at RCA and Protected Area Exits**
  - Stop and Count Mode - 75 nCi
- **Personnel Contamination Monitors**
  - RCA Exit - <5,000 dpm/100 cm^2
- **Whole Body Counter**
  - Termination Whole Body Counts - 3 to 4 nCi
- **Small Article Monitors**
  - < 5,000 dpm/100 cm^2

Plant Improvements *(continued)*

Whole Body Counter Relocated Inside the Protected Area

Plant Improvements *(continued)*

New Small Article Monitor for Use at the Whole Body Counter

Plant Improvements *(continued)*

Portal Monitors at the Protected Area Exit

Plant Improvements *(continued)*

Portal Monitor at Radiation Controlled Area Exit

Plant Improvements *(continued)*

Large Area Beta Sensitive Scintillation Detectors to Enhance Contamination Surveys

Plant Improvements *(continued)*

Vehicle Monitor On Site

Target Completion:

12/2003

Current Situation 2003 Performance

- **Initiated Operation Clean Sweep**
  - To date, 3 items in the Protected Area (outside of the RCA)
- **2 Instances of Contaminated Tools Identified Via Gate Pass Procedure**
  - Prevented release from the Protected Area
- **Response to Alarms Has Been Rigorous**
  - Timely and thorough response to personnel contamination monitor and electronic dosimeter alarms
- **Positive Control Over Entries Into High Radiation Areas and No Unplanned Exposures**
- **Daily Management Observations Focused on Procedure Compliance and Performance**

Going Forward

- **Increased Use of Self-Assessment**
  - Pre-outage assessment scheduled by independent CHP
  - Two week independent outage assessment
  - Strengthened use of Operating Experience. Utilize all lessons learned from OE or formal justification required for not implementing lessons learned
  - Targeted benchmarking completed for radioactive material control and outage preparation
- **Target Top Decile Performance in ALARA**
  - Initial 2003 target - 100 Rem (includes a 90 Rem outage)
- **Error free outage**
  - Zero tolerance for unplanned doses and uncontrolled radioactive materials
- **Completion of Over 100 Excellence Plan Actions Prior to SL2-18**
- **QA is Performing Targeted Effectiveness Review of Corrective Actions**

Summary

- **The Station Did Not Recognize the Latent Organizational Issues in RP. Issues Emerged During the Stress of a Short Outage**
- **To Ensure Other Organizations Are Not in a Similar Condition, Excellence Plans Are in Development for the Operations and Maintenance Organizations**
- **These Plans Will Be Rolled Up Into a Station Wide Excellence Plan**
  - The plans will include the following initiatives
    - Supervisory Enhancement Program
    - Increased emphasis on the station management observation program including “coach the coach” sessions
    - Strengthening the Condition Report process to enhance ability to detect negative trends through the use of leading indicators