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Quad Cities Nuclear Power Station

NRC Regulatory Conference
ALARA Finding
Safety Relief Valve Replacement

February 13, 2001

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Meeting Agenda

❒ Introduction	Tim Tulon
❒ Background, Root Cause and Corrective Actions	Ellen Anderson
❒ Station Concluding Remarks	Tim Tulon
❒ Dose Estimation	Susan Landahl

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Introduction

Tim Tulon

Site Vice President

Quad Cities Generating Station

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Background, Root Cause and Corrective Actions

Ellen Anderson
Radiological Protection Manager
Quad Cities Generating Station

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Background

- Q1R16
  - Drywell Dose Rates Much Greater Than Anticipated
  - Moisture Carry-over Created Significant Dose Rate and Contamination Level in Steam Side Systems
- Safety Relief Valve (SRV) / Electromatic Relief Valve (ERV) / Target Rock Replacement Was Impacted by Dose Issues

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Background

- We Concur With the Facts in the Inspection Report
- Our ALARA Process Requires In-Process Reviews
- Conducted Post-job Review, Root Cause Investigations and Self Assessment of the ALARA Program
- Problems Identified with Ineffective Response to Changing Conditions of Job

Root Cause

- Ineffective Job Management by Radiation Protection (RP) and Maintenance Contractor.
- ERV/SRV Replacements Were Not Re-planned Although Several Critical Job Attributes Had Changed.

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Corrective Actions to Prevent Recurrence

- Develop and Implement an Exelon Job Standard for Station ALARA Group that Provides Guidance to Ensure Effective Job Management is Maintained, Especially Under Changing Conditions. The Standard Will Include:
  - Criteria When Re-planning is Required
  - Criteria When Station ALARA Committee (SAC) Approval is Required for Updated Plans
  - Criteria for Use of Project Managers

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Corrective Actions

- RP and Mechanical Contractor Determine Method for More Accurately Estimating and Monitoring Person-hours Versus Job Progress for High Dose Jobs
- Develop Contingency Plan for Extended Ventilation Outages
- Videotape ERV/SRV Replacement Next Refuel Outage As Training Tool
- Update SRV Replacement Procedure to Include Operating Experience Review

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Station Concluding Remarks

Tim Tulon

Site Vice President

Quad Cities Generating Station

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Dose Estimating

Susan Landahl
Director, Generation Support
Midwest Regional Operating Group

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ALARA Performance

- Exelon does not agree with the position that the estimate prior to start of work is the only estimate to use to determine an ALARA Finding
- Setting challenging goals and driving to meet them are the key elements of continuous improvement in any program
- Central to our discussion today is the issue of dose estimating - but first some perspective on our overall ALARA performance

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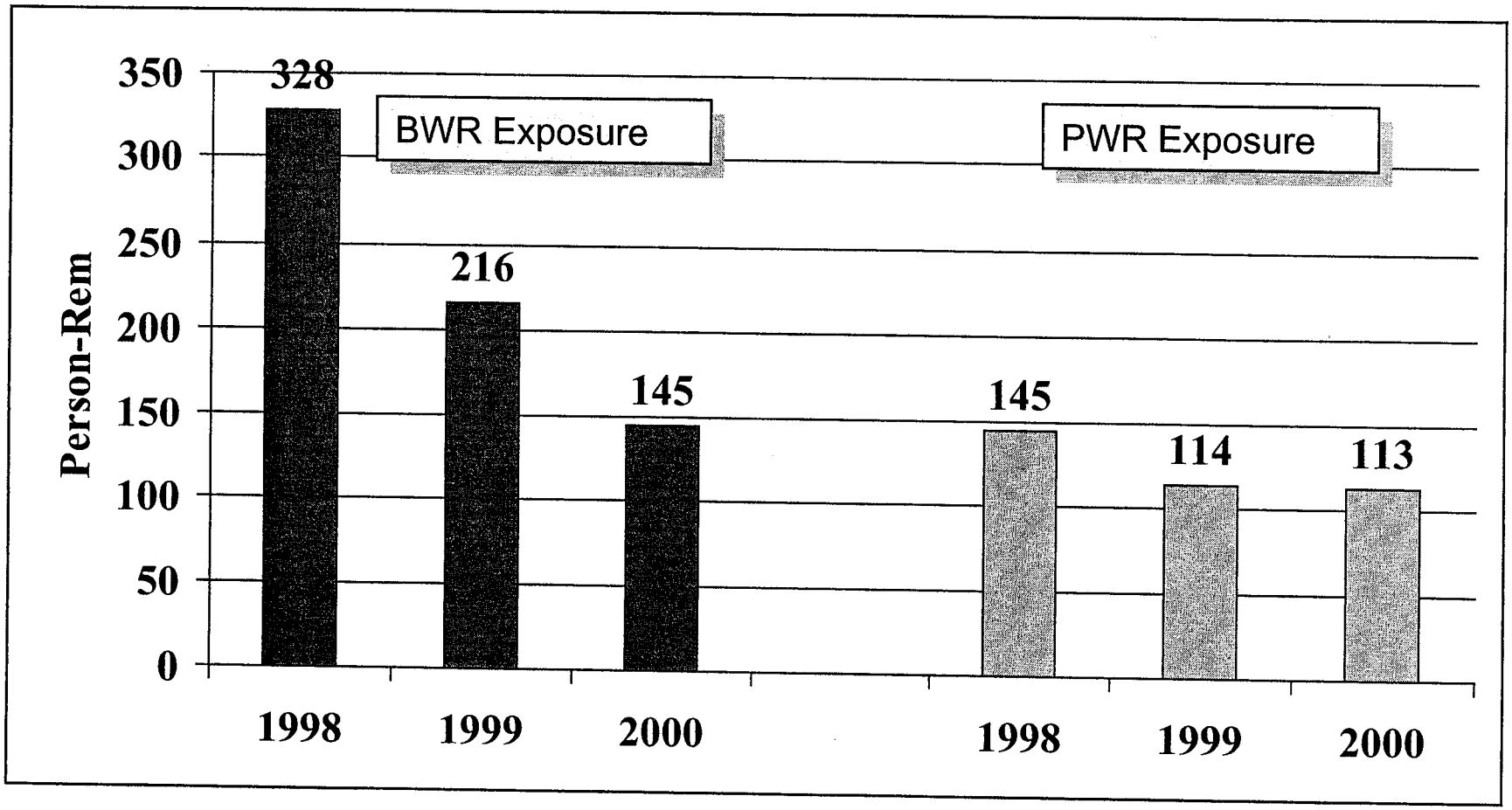
Average ComEd Unit Refuel Outage Exposure

(BWRs vs PWRs, excluding Q1R16)



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Exposure Control Improvements

- Aggressive goal setting
- Material condition improvements (zinc and NMCA)
- Improved planning - on-line and outage
  - Detailed ALARA Planning for daily activities
  - Micro ALARA Planning at lower thresholds
  - Dose Reduction High Impact Teams (HIT) chartered by the SACs
- Management challenges for high exposure jobs
- Integrated self-assessments across all sites
- Implement "lessons learned" (Exelon-wide) to accelerate the cycle of continuous improvement

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Industry Guidelines on Dose Estimating

- INPO 91-014, "Guidelines for Radiological Protection at Nuclear Power Stations"
  - Chapter I addresses Radiological Performance Goals
  - Radiological performance goals should be established to encourage continual improvement
  - Goals should be based on attaining standards of excellence.

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Industry Guidelines on Dose Estimating

- INPO 91-014 also describes work-in-progress and post-work reviews (Chapter V.2)
  - In-progress reviews are recommended at pre-established intervals for jobs exceeding the station's action levels. . . .
  - Intervals can be designated as a percent of estimated man-rem or person hours, percent complete

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Industry Guidelines on Dose Estimating

- National Council on Radiation Protection and Measurements (NCRP) guidance
  - Report No. 120, "Dose Control at Nuclear Power Plants"
  - "After goals are established, changes sometimes occur in work program requirements. **If these changes are significant, goals should be adjusted (lowered or raised) to ensure that they remain realistic."** (emphasis added)

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Industry Guidelines on Dose Estimating

- Re-estimation of jobs in progress is a standard practice of industry best ALARA programs
  - 3 of 4 INPO-identified "top performers" change dose estimates as a result of in-progress reviews
  - Responses from ten other industry peers identified only one other plant who does not
  - Exelon's sites consistently apply this practice as an integral part of our ALARA program

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Quad Cities Specifics

- The finding was based on the job estimate at the start of work
  - This practice does not acknowledge emergent issues that arise during execution of the job
- Factors impacting the SRV job
  - Internal contamination, heat stress issues, additional dose impacts
  - The October 23, 2000 revised projection of 59.2 rem should have been used as the point of reference

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Conclusion

- Re-estimation of dose during performance of work is the correct practice
- Application of the screening criteria for this specific case does not acknowledge this practice
- The ALARA re-estimate of 59.2 rem, not 45 rem should be used in evaluation of potential ALARA findings
- Exelon requests that the application of the screening criteria for this specific finding be reconsidered
- Exelon will use the established process and work through industry groups to resolve this issue generically