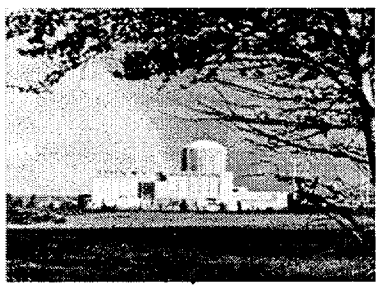
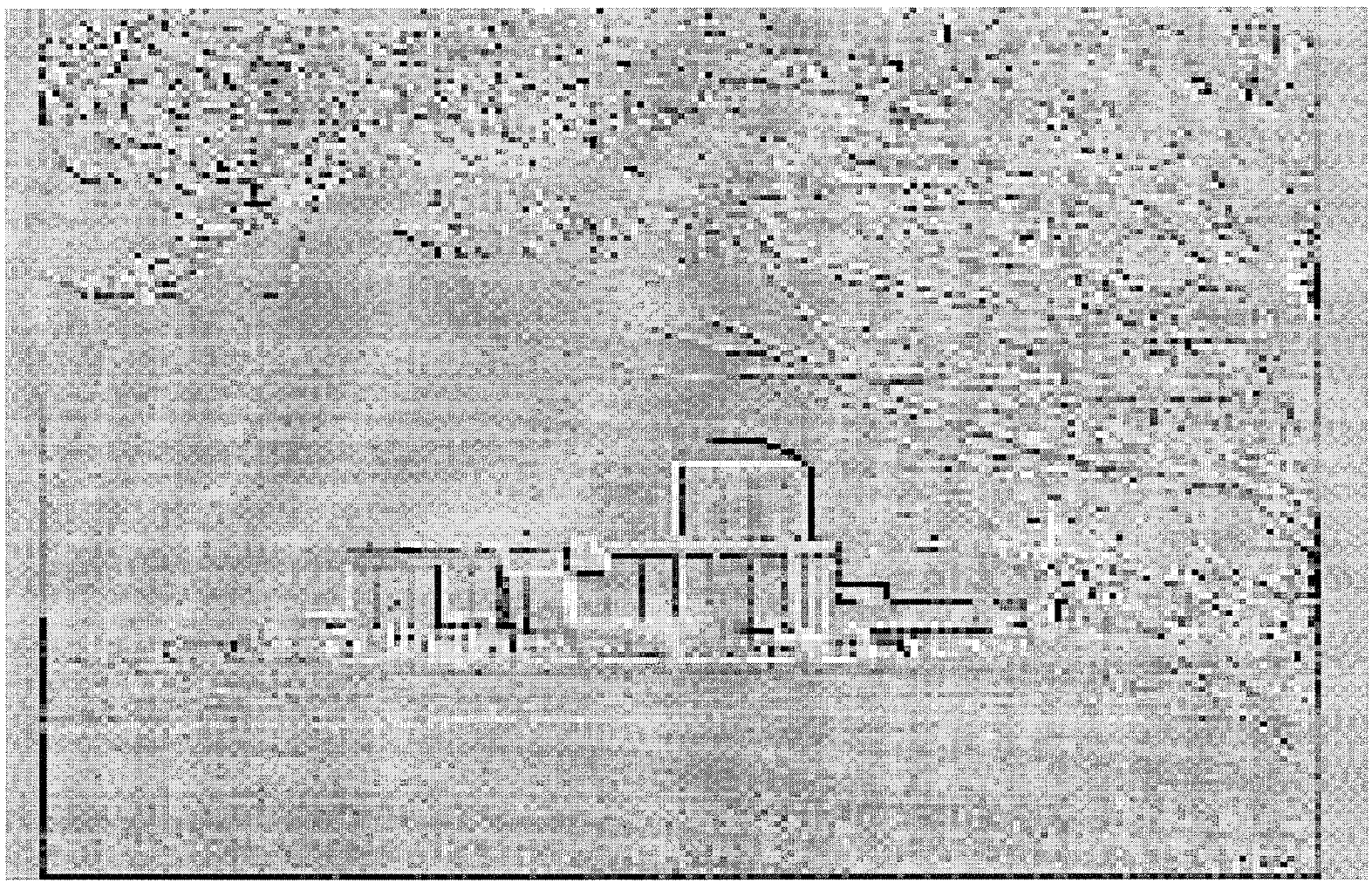
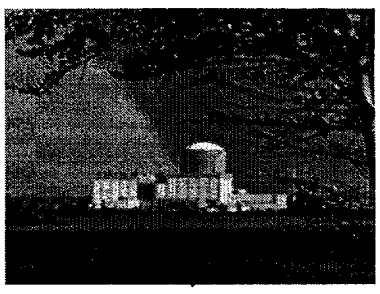


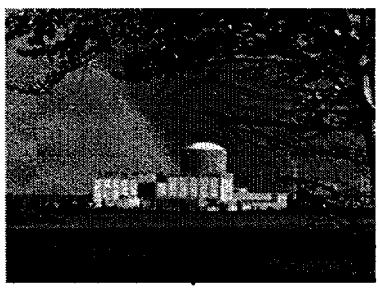
Kewaunee Nuclear Power Plant





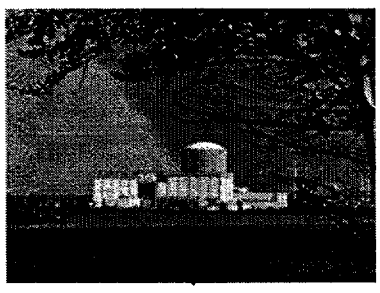
Agenda

- Introduction (Mark Reddemann)
- Alert and Notification System (Rick Repshas)
  - Root Cause
  - Corrective Actions
  - Extent of Condition
- Shift Augmentation (Rick Repshas)
  - Root Cause
  - Corrective Actions
  - Extent of Condition
- EP Independent Assessment (Kyle Hoops)
  - Background
  - Improvement Areas
  - Corrective Actions
- Significance Determination (Tom Webb)
- Closing Statement (Charlie Schrock)



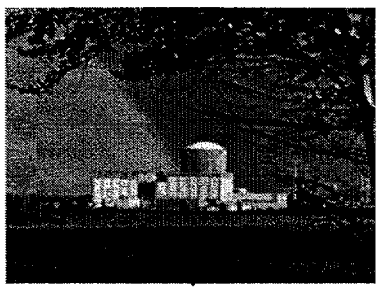
Introduction

- Corrective Action Program failed to correct declining EP program performance.
- Enhancements to Kewaunee's Corrective Action Program are an ongoing plant priority.
- Root cause analyses using Kewaunee's strengthened process have been completed for both the siren reliability and staff augmentation issues.
- Corrective actions taken have remedied these EP weaknesses.
- Plan implemented to improve overall EP program performance.
- Effective management oversight, along with successful implementation of Kewaunee's enhanced Corrective Action Program, will ensure continued good EP program performance.



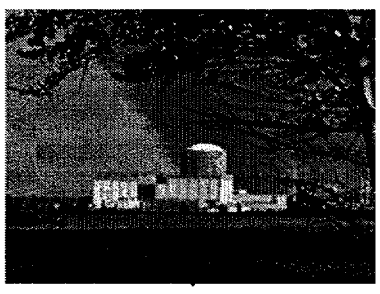
Alert & Notification System And Staff Augmentation

Rick Repshas



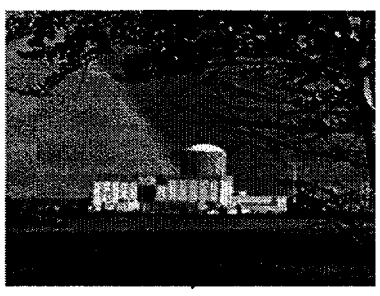
Root Cause Method

- Formed teams to investigate siren and staff augmentation performance
- A root cause evaluation was performed by an experienced root cause analyst using our new root cause evaluation guideline
- All group members attended root cause training
- Reviewed maintenance records and corrective action documents, test data, and procedures
- Performed failure mode analysis
- Conducted interviews
- Developed root causes, contributing causes, and corrective actions to prevent recurrence
- Evaluated extent of condition



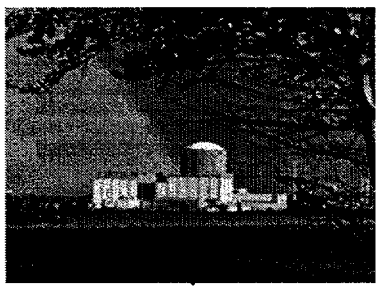
Alert Notification System Contributors to the Decline in Siren Test Results

- August 1998
  - Automatic growl test
- April 1999
  - Software change
- January 2000
  - Switch mispositioning
- February 2000
  - Automatic growl during system change out
- Component degradation results in declining performance trend



Alert and Notification System
August 19, 1998
Growl Test

- Description of Test
  - A routine automatic growl test was conducted
  - 7 of 13 sirens indicated a failure
  - Apparent cause is believed to be a system communication failure
- Root Cause
  - Unknown
- Consequence
  - Insufficient information to determine siren performance
  - Subsequent testing on September 2, demonstrated at least 11 of 13 would have likely operated



Alert & Notification System
April 7, 1999
Full Test

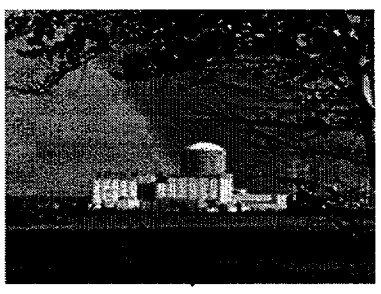
- Description of Test
  - Software changes to address concerns during the mink welping season
- Root Causes
  - There was no requirement to use the design change process to modify the system (RC#1)
  - The guidance for siren activation did not identify alternate methods to activate the system (RC#2)
- Consequences
  - Insufficient indication of siren activation
  - Software change would only affect testing and not a siren activation in a real event
  - Subsequent testing on May 5 demonstrated that at least 9 of 13 sirens would have operated

Alert & Notification System
January 5, 2000
Full Test

- Description of Test
  - Power switch turned off
- Root Cause
  - The guidance for siren activation did not identify alternate methods to activate the system (RC#2)
- Consequences
  - Failed to perform an adequate test
  - County demonstrated that in an actual event, they would use the backup transmitter
  - Subsequent testing on February 2 demonstrated that at least 12 of 13 sirens would have operated

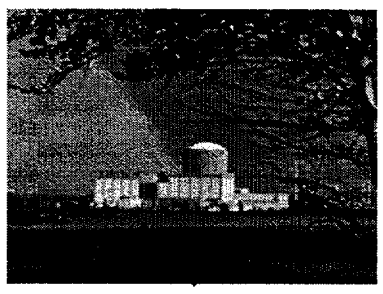
Alert & Notification System
February 16, 2000
Growl Test

- Description of Test
  - During activation system replacement an automatic growl test did not adequately test new siren system
- Root Causes
  - There was no requirement to use the design change process to modify the system (RC#1)
  - Management developed a complacent attitude regarding siren performance (RC#3)
- Consequences
  - Inadequate test because only the old portions of the system were tested
  - County had guidance for activating both old and new systems during an actual event and had been briefed on the need to actuate both systems
  - Subsequent testing on March 1 demonstrated that at least 12 of 13 sirens would have operated



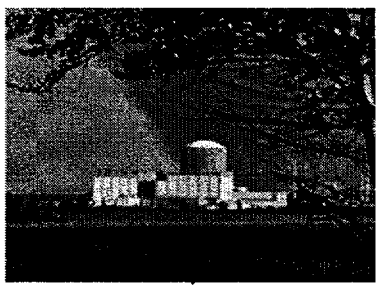
Alert & Notification System Event Root Cause Summary

- There was no requirement to use the design change process to modify the system (RC#1)
- The guidance for siren activation did not identify alternate methods to activate the system (RC#2)
- Management developed a complacent attitude regarding siren performance due to the planned replacement of the siren activation system (RC#3)



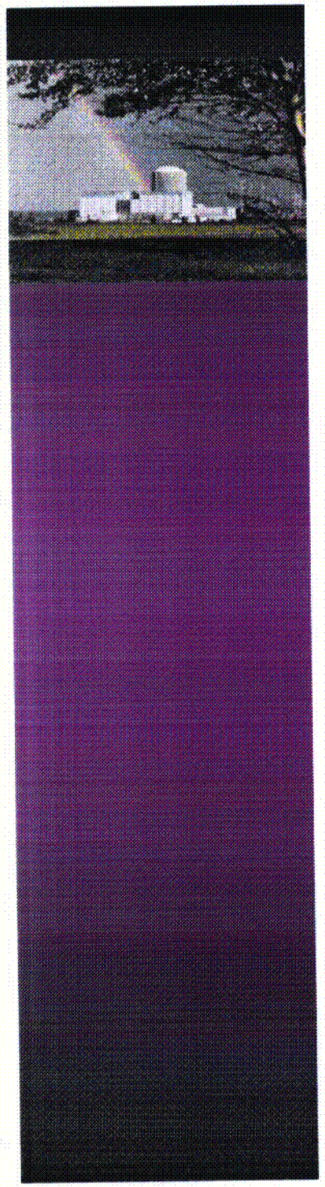
Alert & Notification System Component Degradation

- Root Causes
  - Management did not initiate root or apparent cause investigation for declining system performance (RC#4)
  - Management developed a complacent attitude regarding siren performance due to the planned replacement of the siren activation system (RC#3)

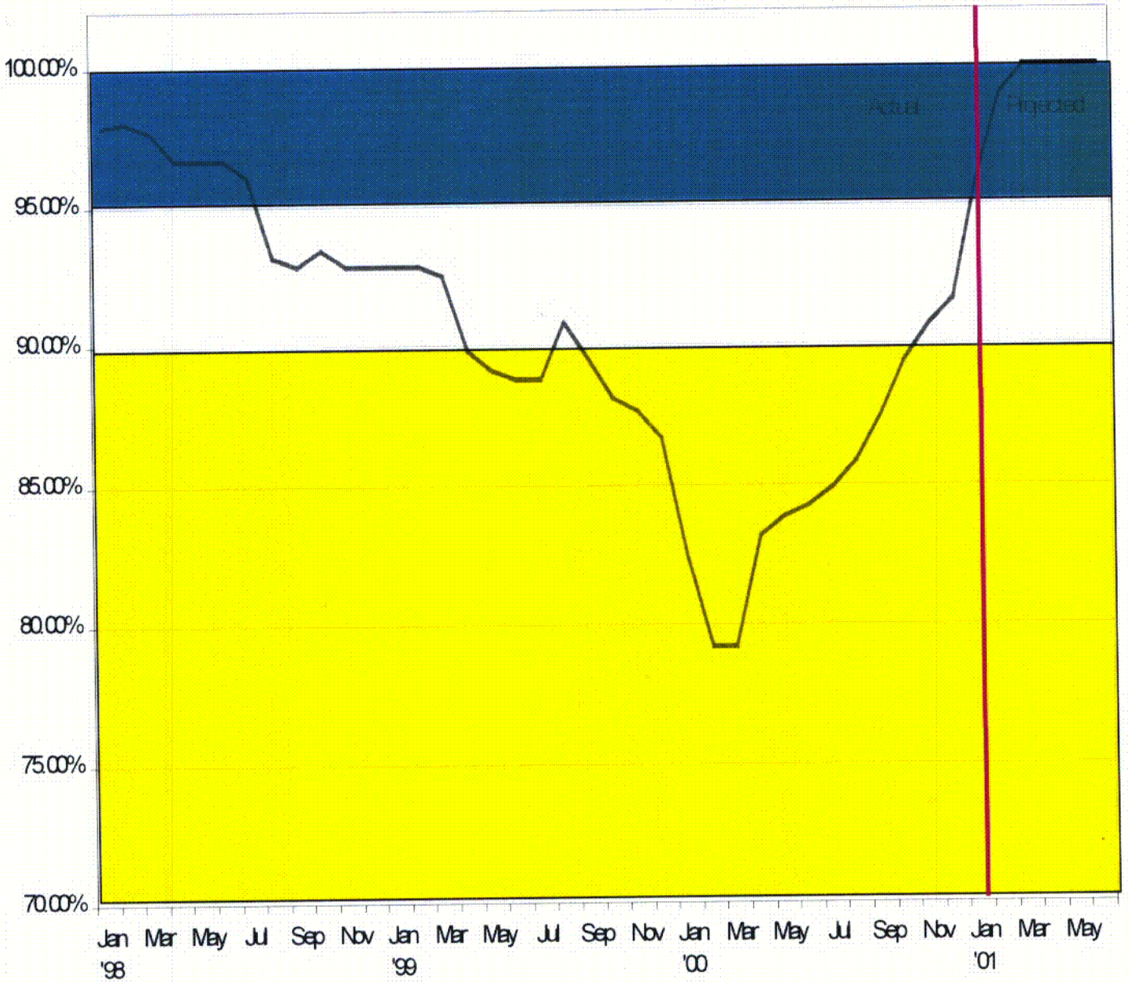


Alert & Notification System Corrective Actions

- Siren Maintenance
  - System and software configuration changes to be processed through KNPP Design Change Process (RC#1)
  - Preventive and corrective maintenance established under KNPP procedures (RC#1)
  - Detailed test procedure has been established (RC#2, RC#4)
- Management Oversight
  - KAP initiation criteria set for siren system (RC#3, RC#4)
  - QA improved oversight
- Results Achieved



12 Month Rolling Average Siren Availability



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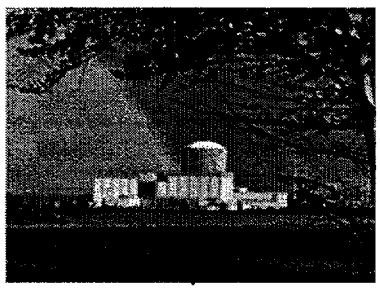
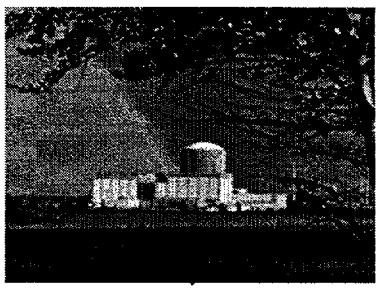


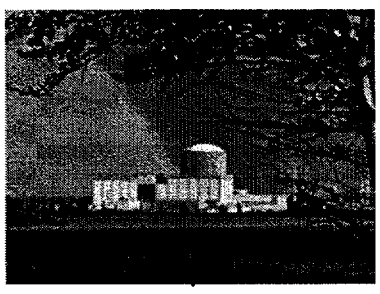
Alert & Notification System Extent of Condition

- Kewaunee Assessment Process (KAP)
- Equipment Configuration Control



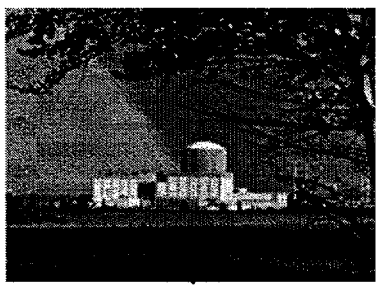
Extent of Condition
Equipment Configuration Control

- Siren maintenance and modifications were not performed using established processes



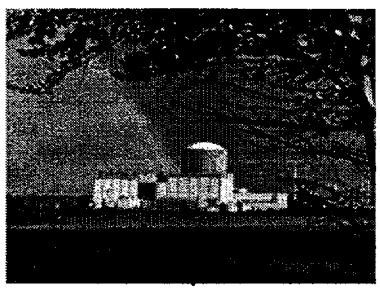
Extent of Condition
Equipment Configuration Control (cont.)

- Results
  - There are controls on all equipment identified that ensure its continued safe operation.
  - The design change process has been changed to explicitly include offsite equipment.
  - The level of plant documentation for work performed by the WPSC substation and transmission group needs to be improved.
  - Maintenance personnel's understanding of the design change process needs to be improved.



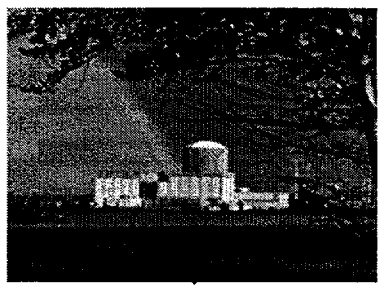
Shift Augmentation

- Kewaunee has not consistently performed successful shift augmentation drills.



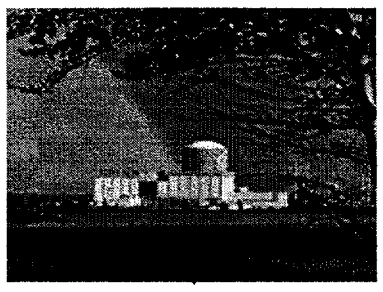
Shift Augmentation Root Cause

- Management has not effectively acted to provide increased depth and flexibility in the emergency response organization. (RC#1)
  - Only a few individuals are assigned to required positions.
  - Test and ERO notification process weaknesses



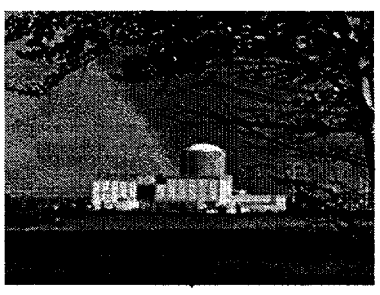
Shift Augmentation Root Cause

- Management has accepted an adverse trend of pager test failures without requiring investigation into root causes (RC#2)
  - Decreasing trends were identified but no root cause was initiated
  - Corrective actions were not adequately assessed for effectiveness



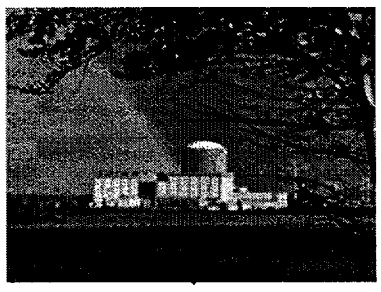
Shift Augmentation Corrective Actions

- KAP improvements described during January 10 meeting. (RC#2)
- Plant Manager issued a letter to ERO stating pager response expectations. (RC#1)
- Training to increase depth in the number of qualified members to fill required positions has been started and is continuing (RC#1)
- An "on-call" rotation was established for required positions (RC#1, RC#2)
- Adding an additional notification system (RC#1)



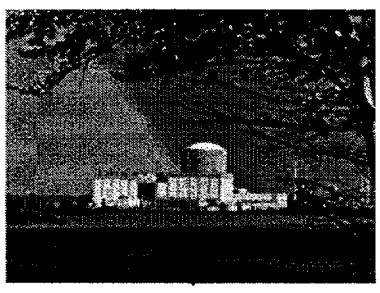
Shift Augmentation Extent of Condition

- The failure to escalate the continuing trends with ERO response is considered a weakness in the corrective action process
- Emergency Preparedness Program Assessment



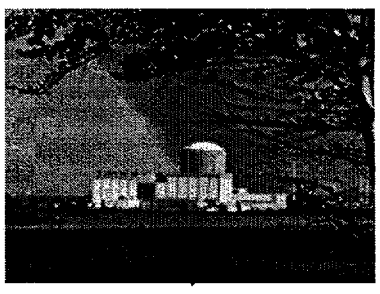
EP Independent Assessment

KYLE HOOPS



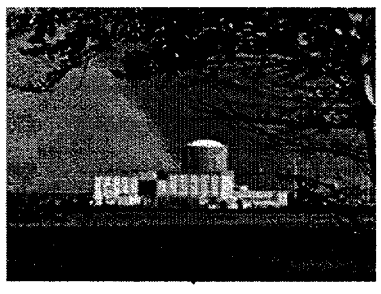
Background

- Compared EP Program to Regulatory Requirements and Industry Standards
- Completed Late October 2000
- Conducted by Industry, NMC, and INPO Personnel



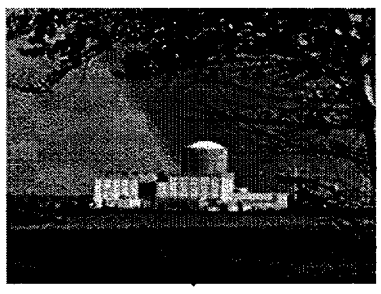
Improvement Areas

- Staff Augmentation
- Protective Action Response Activities
- Medical Services Support
- EP Program Review of Changes
- Periodic Drill/Exercise Performance
- EP Procedure Revisions
- Performance Indicator Implementation



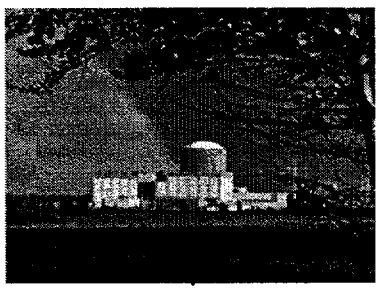
Corrective Actions

- Providing Resource Support
- Action Plan Implementation



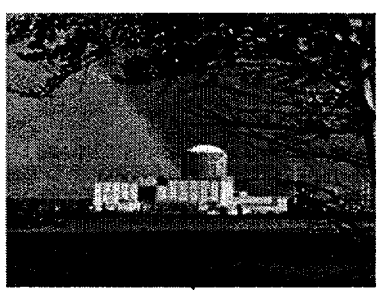
Significance Determination

Tom Webb



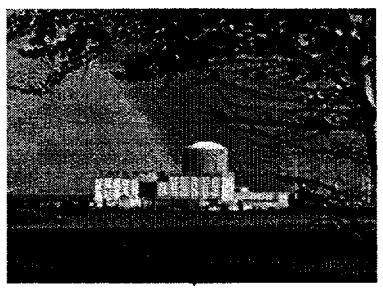
Significance Determination

- Shift Augmentation
  - NMC concurs that this issue meets the NRC definition of a white finding as described in the Significance Determination Process



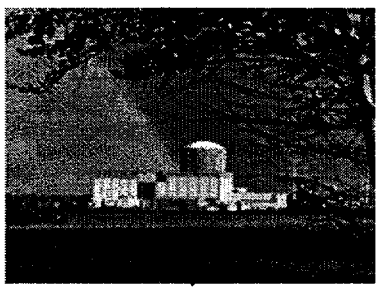
Significance Determination Sirens

- Sirens
  - NMC concurs siren testing resulted in a yellow performance indicator
  - The NMC could not conclude from guidance provided for the Revised Reactor Oversight Process that a yellow finding is appropriate
  - NMC does not believe that the siren finding has substantial safety significance; therefore, it should not be a yellow finding



Comments on the RROP

- The NMC considers the implementation of the Revised Reactor Oversight Program for these issues a success.
  - Highlighted weaknesses in the corrective action program
  - Corrective actions are being taken to address the equipment issues and the process problems.



Closing Summary

Charlie Schrock