Summary of Industry Trend Results for the AARM

This section provides a summary of the industry trends information that will be presented to NRC senior managers for review at the AARM, as listed below. Detailed supporting information may also be presented.

1. Ex-AEOD Indicators (long-term graphs only)

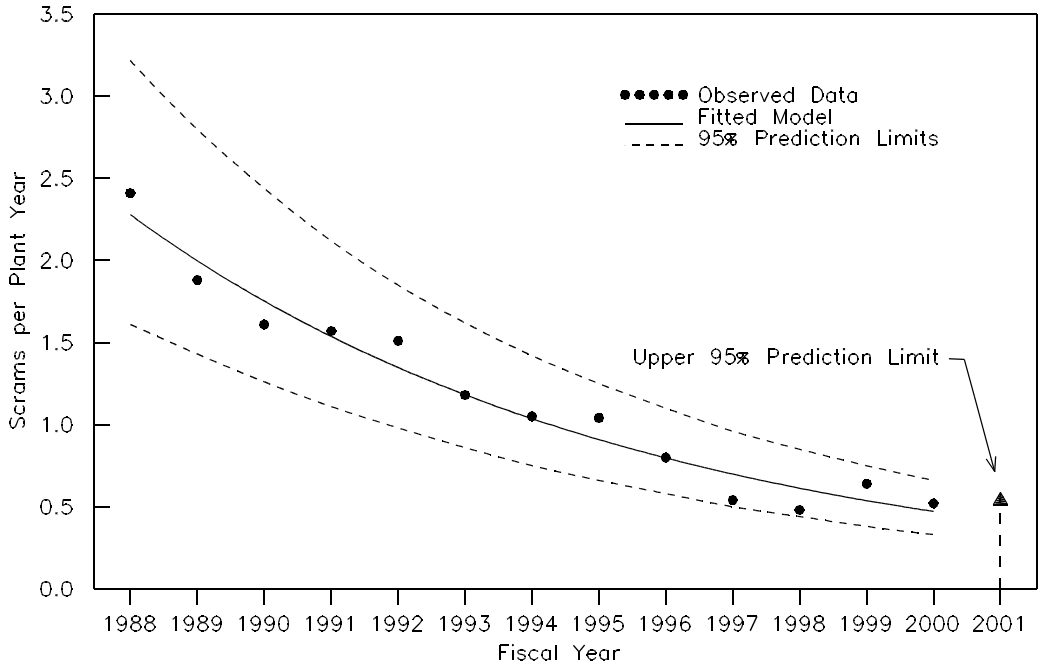
2. ROP Performance Indicators (short-term graphs only)

3. ASP Program Results

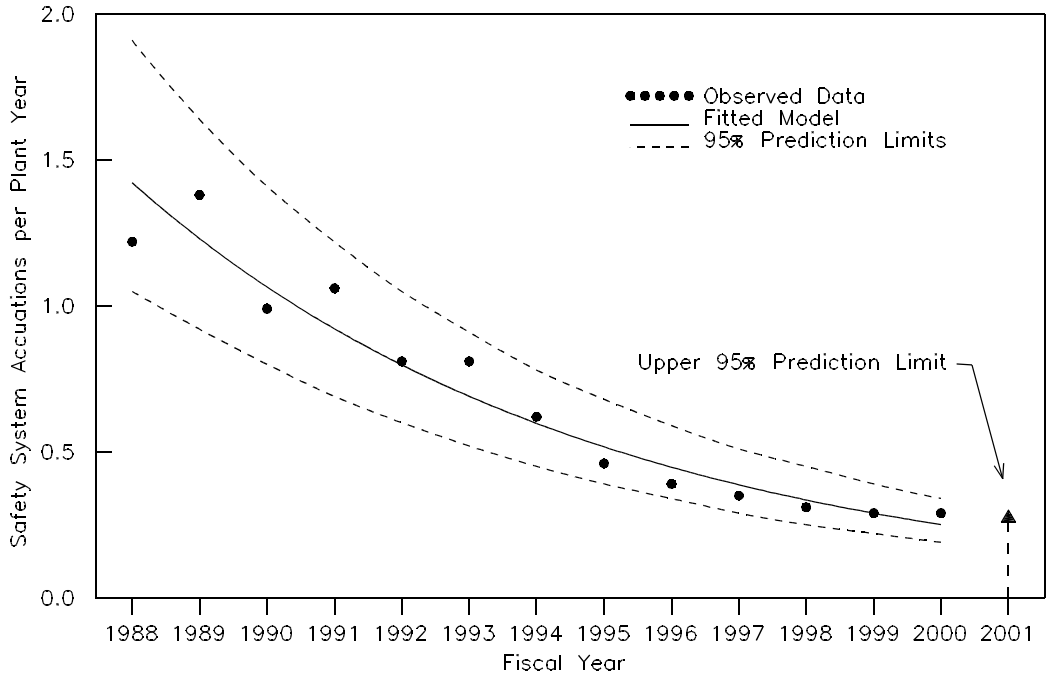
4. ROP Program Information
   - A. Action Matrix Trends
   - B. Audit of Significant ROP Inspection Findings

1. Ex-AEOD Indicators (long-term graphs only)

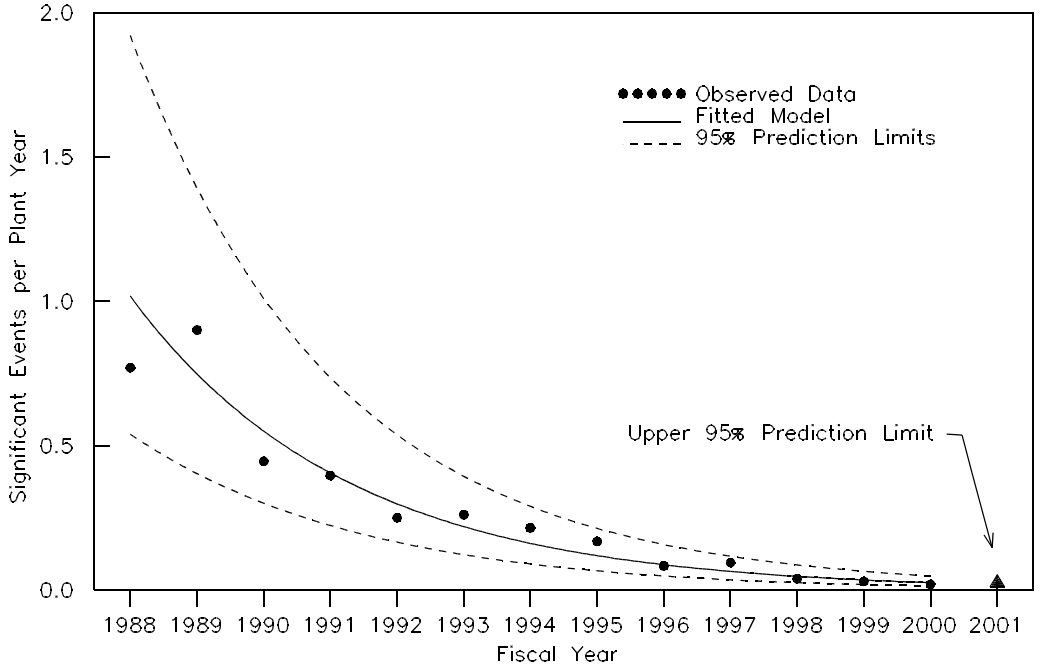
Automatic Scrams While Critical



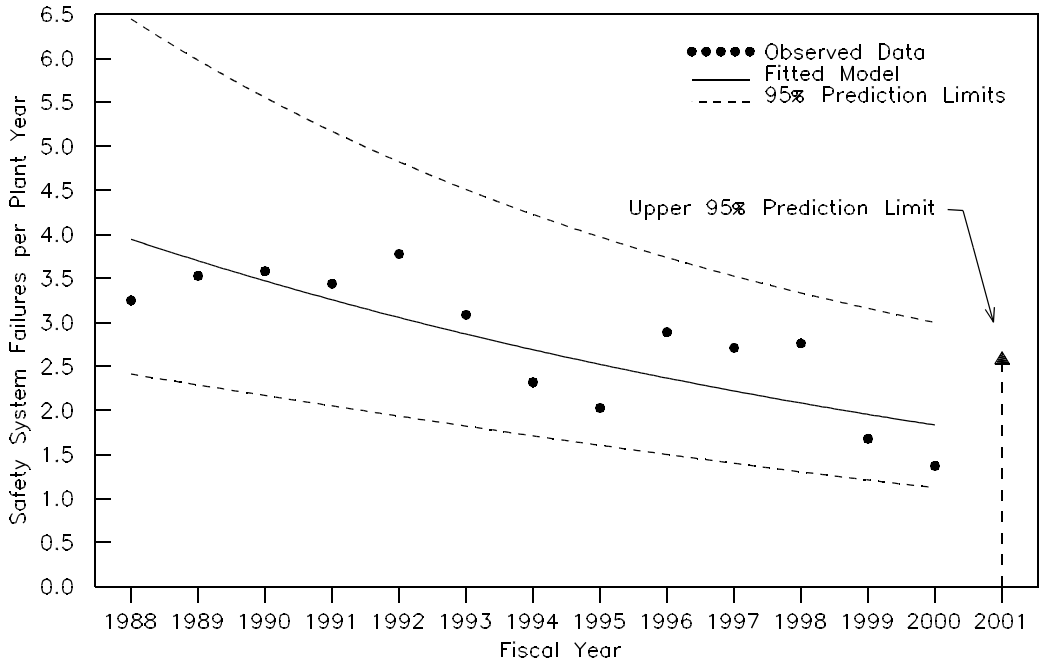
Safety System Actuations



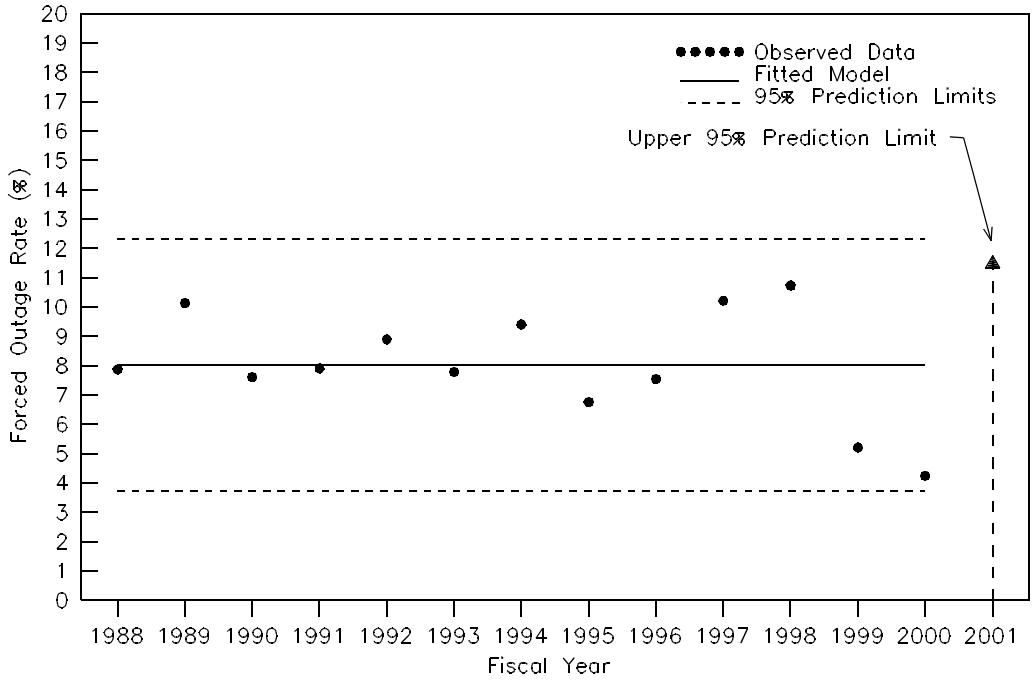
Significant Events



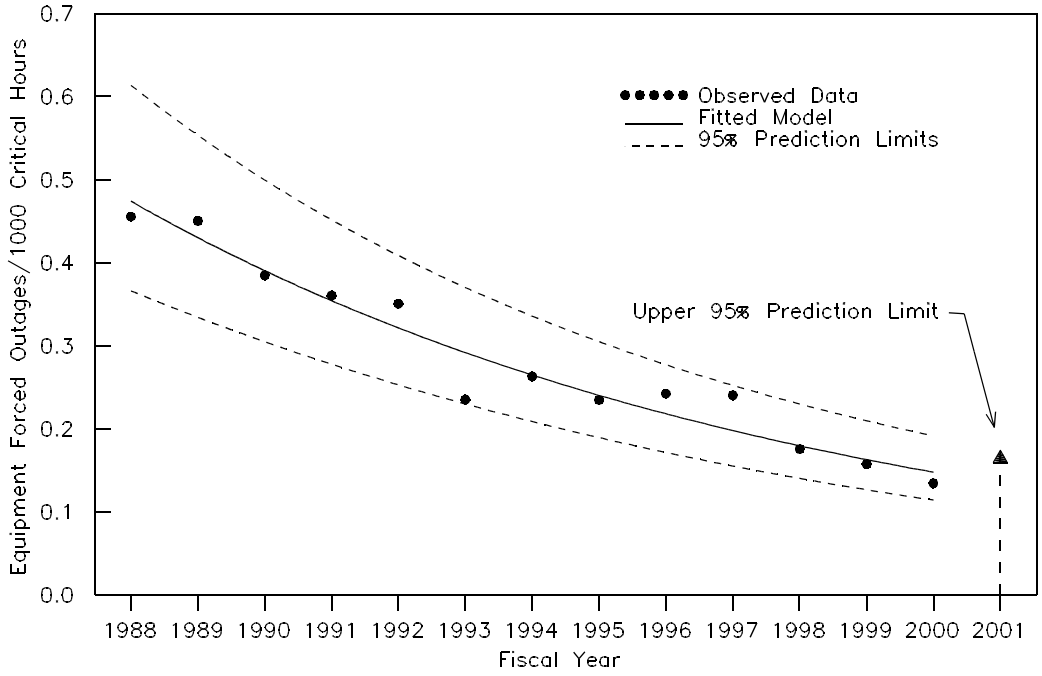
Safety System Failures



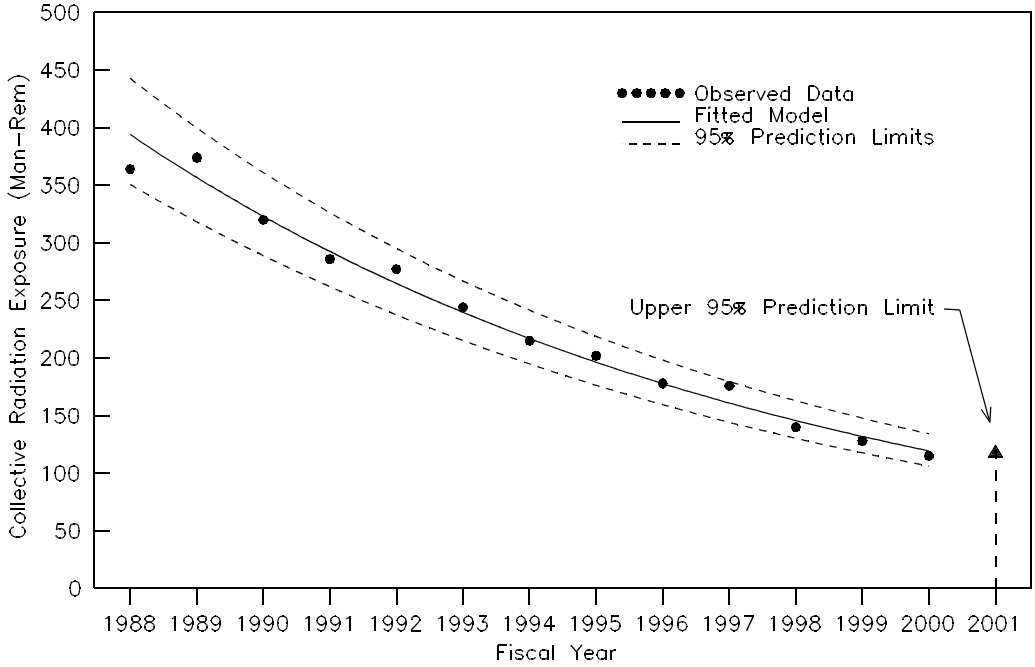
Forced Outage Rate



Equipment Forced Outages



Collective Radiation Exposure



Page #s 6 - 19 can be found under Accession # ML011570251.

3. ASP Program Results

The below graphs are provided for illustration only. A detailed explanation is contained in SECY-01-0034, "Status Report on Accident Sequence Precursor Program and Related Initiatives."

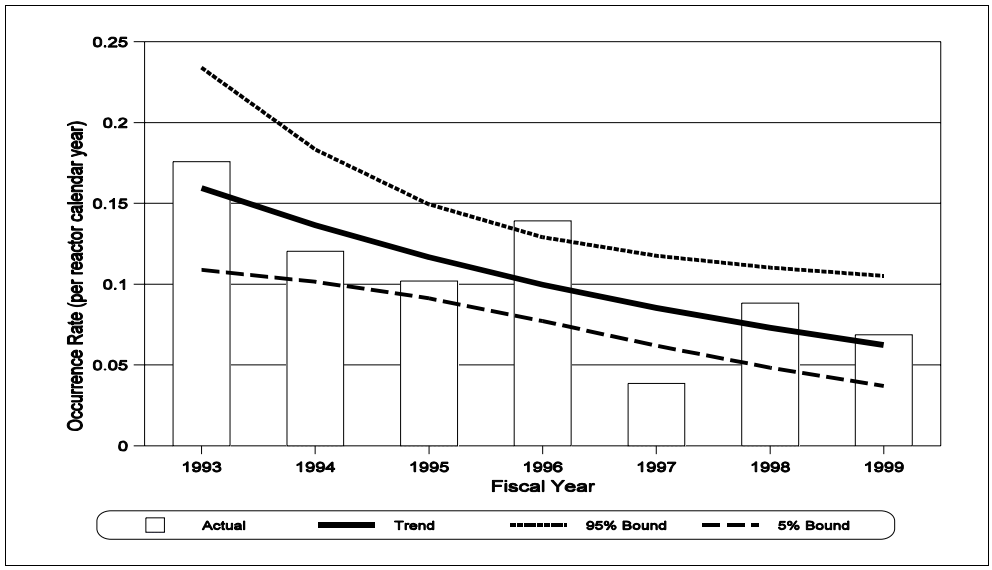


Figure 1. Precursor occurrence rate for 1993-1999 plotted against fiscal year. The trend is statistically significant (p-value = 0.0068). The result for 1999 is preliminary.

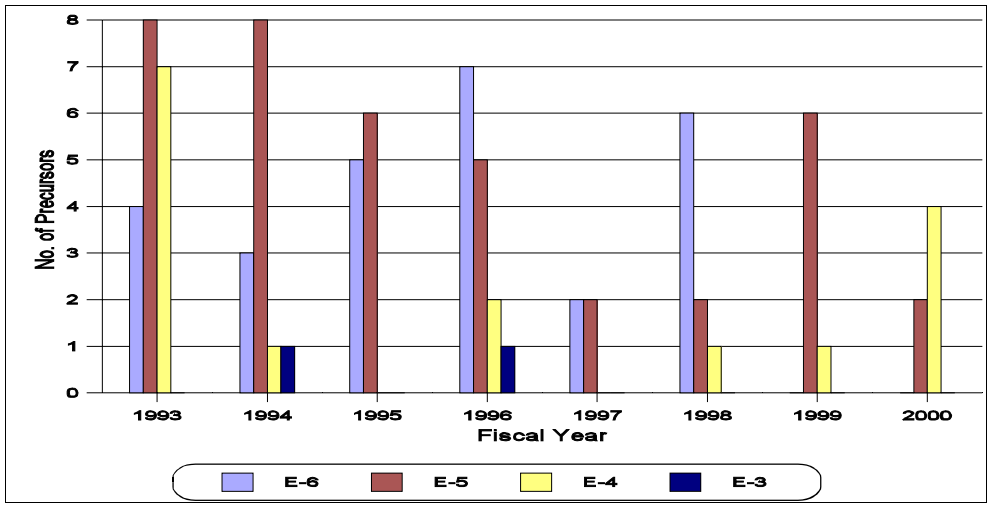
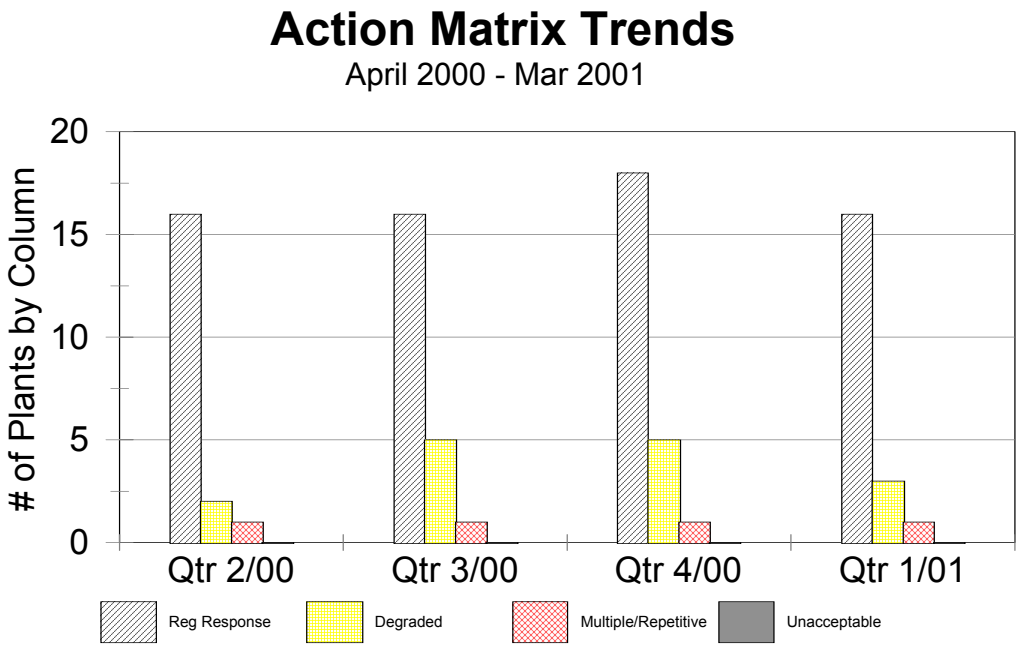


Figure 2. Conditional core damage probability results from ASP Program (1993-2000) for each of the CCDP bins (*E-3*: $\geq 1 \times 10^{-3}$; *E-4*: 9.9×10^{-4} to 1.0×10^{-4}; *E-5*: 9.9×10^{-5} to 1.0×10^{-5}; *E-6*: 9.9×10^{-6} to 1.0×10^{-6}). Results for FYs 1999 and 2000 are preliminary.

4. ROP Program Information

The industry-wide indicators are quantitative and derived from licensee data. However, the ROP relies on both inspection findings and plant-level indicators. The staff examined summary results of its ROP to assess the information that is available should there be an adverse trend in the quantitative industry-wide indicators, and for possible program feedback for the ROP. The results are provided below for the first year of ROP implementation.

A. Action Matrix trends. The NRC provided oversight of 101 plants using the ROP (DC Cook units 1 and 2 were under the IMC 0350 process during the first year, although they have recently been placed under the ROP). The majority of the plants were in the licensee response column of the ROP Action Matrix, which corresponds to the baseline level of NRC oversight. The below chart shows trends in the number of plants that are in the regulatory response, degraded cornerstone, multiple/repetitive degraded cornerstone, and unacceptable performance columns of the Action Matrix, which correspond to increasing levels of regulatory engagement with the licensee. A trend of degrading performance would be one that showed a migration of plants from the licensee response column to one of the other columns in the Action Matrix. For the first year of ROP implementation, this chart does not show any trends.



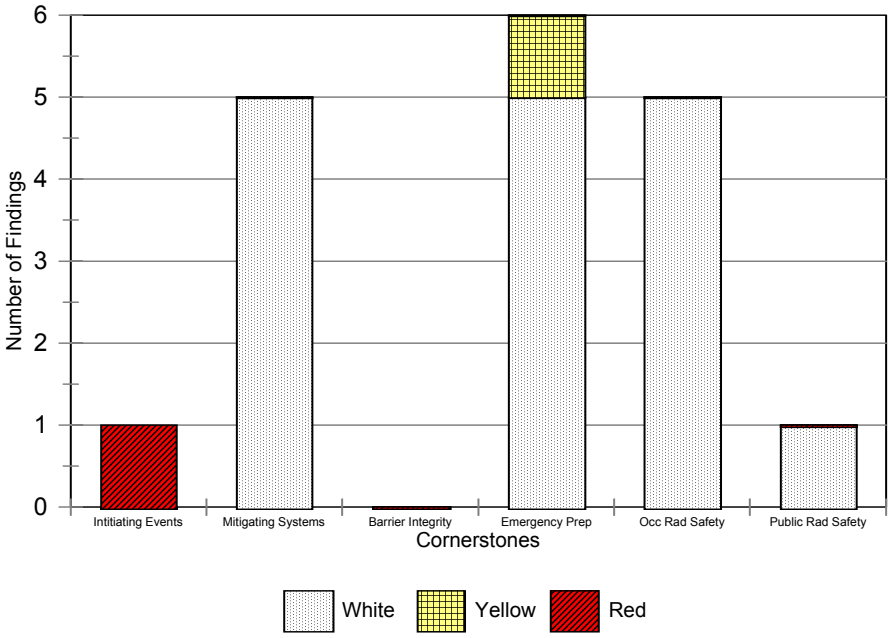
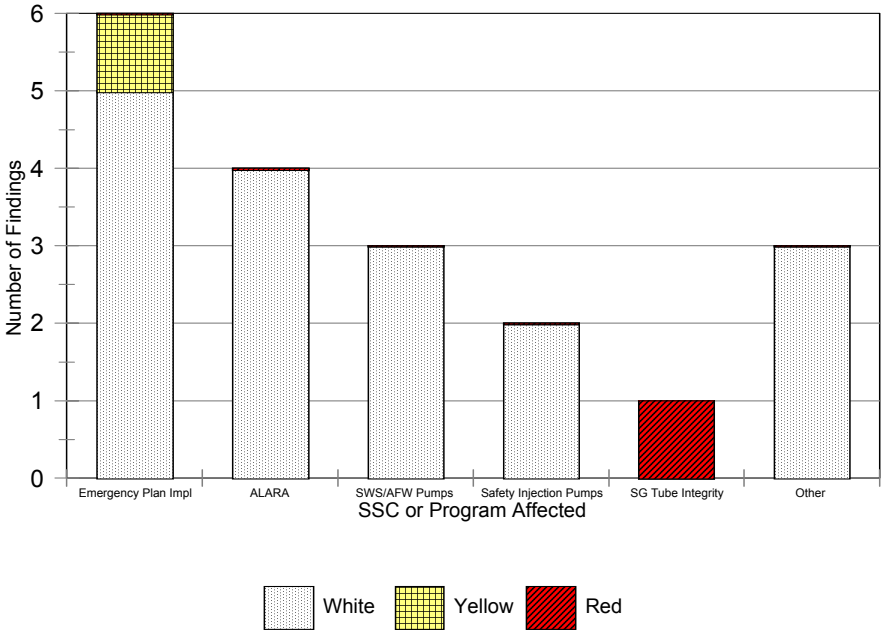
B. ROP Inspection Findings. IIPB performed an audit of significant inspection findings (final other-than-green SDP determinations) in inspection reports during the first year of implementation of the ROP (April 2, 2000 - March 31, 2001). The audit was intended to illustrate the information available to supplement the industry-wide indicators in each cornerstone. The results, summarized below, demonstrate a wide variety of issues in each cornerstone.

Plant	Cornerstone	Color	SSC/Program Affected	Apparent Cause
INITIATING EVENTS CORNERSTONE				
Indian Point 2	Initiating Events	Red	Steam Generator Tubes - February 2000 SGTF	Failure to take adequate corrective actions regarding 1997 SG tube inspection results
MITIGATING SYSTEMS CORNERSTONE				
Oconee 1	Mitigating Systems	White	High Pressure Injection Pump - HPI may not be able to draw suction from SFP following tornado	Pressure, temperature or hydraulic requirements not adequately considered and SFP as a suction source for HPI was not assured following tornados
Millstone 2	Mitigating Systems	White	AFW - Speed control for TDAFW pump was unresponsive and erratic	Inadequate evaluation of degraded condition and untimely corrective actions.
Summer	Mitigating Systems	White	AFW - Discharge isolation valve for TDEFW pump shut for 48 days.	Failure to follow procedures
Harris	Mitigating Systems	White	Safety Injection Pump - Failed thrust bearing on C CSIP	
Prairie Island 1&2	Mitigating Systems	White	Service Water Pumps	Design deficiency in that the filter backwash water pumps were powered from non-Class 1E power vice Class IE
BARRIER INTEGRITY CORNERSTONE (NO FINDINGS)				
EMERGENCY PREPAREDNESS CORNERSTONE				
Indian Point 2	Emergency Preparedness	White	Emergency Plan Implementation - Failure of ERO to respond in 60 minutes	Program structure or design problems contributed to the failure to meet emergency planning standards
Indian Point 2	Emergency Preparedness	White	Emergency Plan Implementation - Failure to establish accountability in 30 minutes	Program structure or design problems contributed to the failure to meet emergency planning standards

Plant	Cornerstone	Color	SSC/Program Affected	Apparent Cause
Indian Point 2	Emergency Preparedness	White	Emergency Plan Implementation - Inadequate communications to the public	Program structure or design problems contributed to the failure to meet emergency planning standards
Kewaunee	Emergency Preparedness	White	Emergency Plan Implementation - Deficiencies identified with staffing ERO during off-hours staff augmentation drills	Inadequate corrective actions taken for previous deficiencies
Cooper	Emergency Preparedness	White	Emergency Plan Implementation - Failure to identify incorrect PARs in a post EP drill critique.	Failure of licensees EP critique process to identify deficiency with PARs
Kewaunee	Emergency Preparedness	Yellow	Emergency Plan Implementation - Alert and notification siren availability	Root cause evaluation was not performed at the depth necessary to identify the causes of the siren performance problems
OCCUPATIONAL RADIATION SAFETY CORNERSTONE				
Callaway	Occupational Radiation Safety	White	ALARA - Scaffolding activities which accrued actual doses greater than 25 person-rem	Poor planning and preparation, failure to properly train workers in dose reduction, failure to ensure good communications
Callaway	Occupational Radiation Safety	White	ALARA - SG eddy current/robotic plugging/stabilizing/electrosleeving activities accrued actual doses greater than 25 person-rem.	Poor planning and preparation, failure to properly train workers in dose reduction, failure to ensure good communications
Callaway	Occupational Radiation Safety	White	ALARA - Each of four jobs (SG manway cover and inserts removal and installation, foreign object search and retrieval, RCP seal replacement) accrued actual doses greater than 5 person-rem.	Poor planning and preparation, failure to properly train workers in dose reduction, failure to ensure good communications
Quad Cities 1&2	Occupational Radiation Safety	White	ALARA - Increased dose for SRV replacement job	Poor planning and preparation, higher than expected source term, and high heat stress environment
Susquehanna 1&2	Occupational Radiation Safety	White	Hot Particle	Failure to conduct adequate radiation surveys for hot particles

Plant	Cornerstone	Color	SSC/Program Affected	Apparent Cause
PUBLIC RADIATION SAFETY CORNERSTONE				
Peach Bottom Units 2 & 3	Public Radiation Safety	White	Radwaste Shipping - Misclassification of radwaste shipment	Licensee did not collect representative resin samples for the purpose of analysis and classification of the waste
PHYSICAL PROTECTION CORNERSTONE				
Quad Cities 1&2	Physical Protection	White	OSRE Contingency Response	

Inspection Findings by Cornerstone



Inspection Findings By SSC/Program