COMMISSION BRIEFING SLIDES/EXHIBITS

BRIEFING ON RESULTS OF AGENCY ACTION REVIEW MEETING - REACTORS

MAY 1, 2002

ROP COMMISSION BRIEFING

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Introduction

- **Plant Discussions/ AARM Results**
- **Industry Trends**
- **ROP Self-Assessment**

Assessment Process under the ROP

- End-of-Cycle Meetings - All plants
- EOC Summary Meeting - Specific plants based on ROP Action Matrix column
- Annual Assessment Letters - All plants
- Annual Public Meetings - All plants
- Agency Action Review Meeting - Specific plants based on ROP Action Matrix column

Elements of the Agency Action Review Meeting

- Conducted IAW approved draft Management Directive 8.14
- Review of Agency Actions:
  - Individual plants per Action Matrix
  - Industry Trends Program (SECY-02-0058)
  - ROP Self-Assessment (SECY-02-0062)
- Material facility concerns, as applicable

Indian Point 2/Cooper Plant Discussions

- Background
- Inspection Activities
- Current Status
- Public Interface
- Next Steps

Industry Trends

- Background
- Communications
- Process
- FY01 Results
- Future Development

Background

- NRC Performance Goal Measure
- Purposes
- Relationship to NRC Processes

Communications

- **Indicators Published on NRC Web Site**
- **Annual Report to Commission**
- **Annual Report to Congress in NRC Performance and Accountability Report**
- **Conferences with Industry**

Process

- **Identify Any Statistically Significant Adverse Industry Trends**
- **Evaluate Underlying Issues and Assess Safety Significance**
- **Agency Response IAW Existing NRC Processes for Generic Issues**
- **Review at AARM**

FY01 Results

- No Statistically Significant Adverse Industry Trends in Safety Performance
- Insufficient Data on ROP Indicators (<4 Years)
- Two Indicators Exceeded "Prediction Limits"

Future Development

- SRM of 8/2001 - Develop Risk-Informed Thresholds "as Soon as Practicable"
- Enhanced Performance Goal Measure
- Potential Additional Indicators
- Improved Data Collection and Reporting

ROP Self-Assessment

- Background
- Overall Results
- Self-Assessment Activities
- Program Area Results
- General Program Issues
- Conclusions and next steps

Background

- April 2, 2000: ROP Initial Implementation
- June 25, 2001: SECY-01-0114, "Results of the Initial Implementation of the New Oversight Process"
- December 31, 2001: Completed ROP2 (with transition to a calendar year)
- ROP2 self-assessment results documented in SECY-02-0062, "Calendar Year 2001 Reactor Oversight Process Self-Assessment"

Overall Results

- Gained greater confidence in program
- Effective in monitoring plant activities
- Program meeting Agency's goals
- Progress on addressing previously identified issues
- Despite successes, challenges remain

Self-Assessment Activities

- Self-assessment metrics - audits, RPS data
- Interface with internal stakeholders - counterpart meetings, bi-weekly ROP conference calls, focus groups, etc.
- Interface with external stakeholders - monthly ROP public meetings, FRN solicitation, other industry forums

Inspection

- **Significant accomplishments**
  - **Completed a comprehensive review of all inspection procedures**
  - **Revised resource estimates to reflect experience**
- **Planned actions**
  - **Issue inspection report guidance**
  - **Revise physical protection inspection procedures**

Significance Determination Process

- **Significant accomplishments**
  - **Revised occupational and radiation safety SDPs**
  - **Implemented training for newly-revised reactor safety SDP**
  - **Accelerating benchmarking of reactor safety SDP phase 2 notebooks**

Significance Determination Process

- **Planned actions- implement improvement plan**
  - **Improve timeliness and consistency**
  - **Early resolution of technical issues**
  - **Continue to improve SDP process and tools**
  - **Improve the clarity of risk-informed ROP decision guidance**
  - **Clarify expectations for ASP and SDP process coordination**

Performance Indicators

- **Significant accomplishments**
  - **Revision to NEI 99-02**
  - **Improved existing SSU PIs and guidance on treatment of fault exposure hours**
- **Planned actions**
  - **Conduct pilot program to test unavailability and unreliability PIs**
  - **Develop improved physical protection and barrier integrity PIs**

Assessment

- Significant accomplishments
  - Guidance for treatment of old design issues
  - Role of the Commission
  - Eliminated "no color" inspection findings
  - Guidance for cross-cutting issues
- Planned actions
  - Approval level for Action Matrix deviations
  - Clarify expectations for exiting the multiple/repetitive degraded cornerstone

General Program Issues

- ROP feedback process
- Resident inspector demographics
- Inspection program resources

Conclusions

- **Program successes**
  - **Supports the Agency's four performance goals**
  - **Monitoring plant activities, identifying significant performance issues, and ensuring appropriate corrective action taken**
  - **Effectively communicating assessment results to the public**

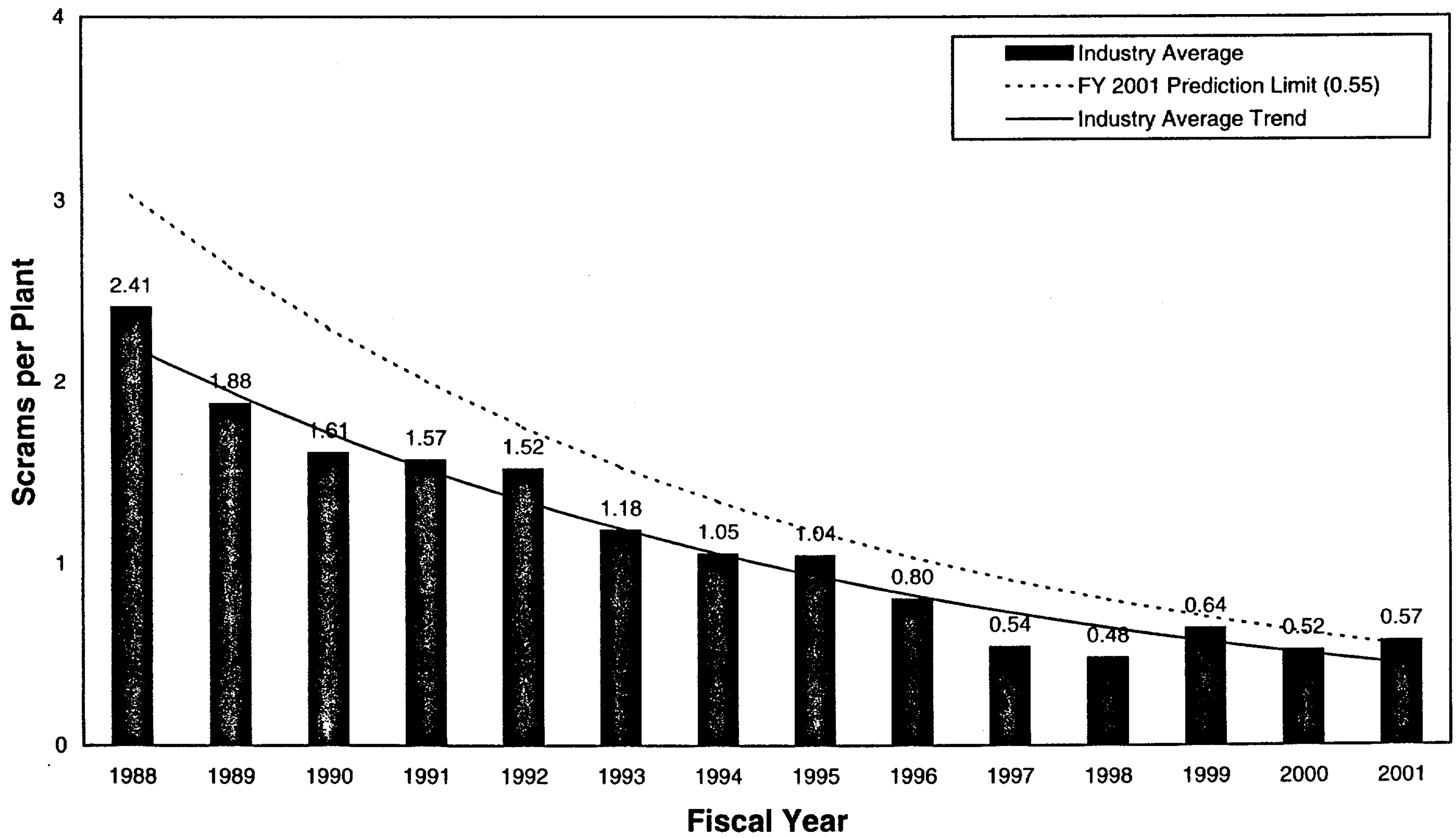
Conclusions (continued)

- **Next steps**
  - **Implement improvement actions**
  - **Continue self-assessment and feedback activities**
  - **Consider internal survey this year**
  - **Increased focus on consistency of program implementation**
  - **Continue stakeholder outreach**

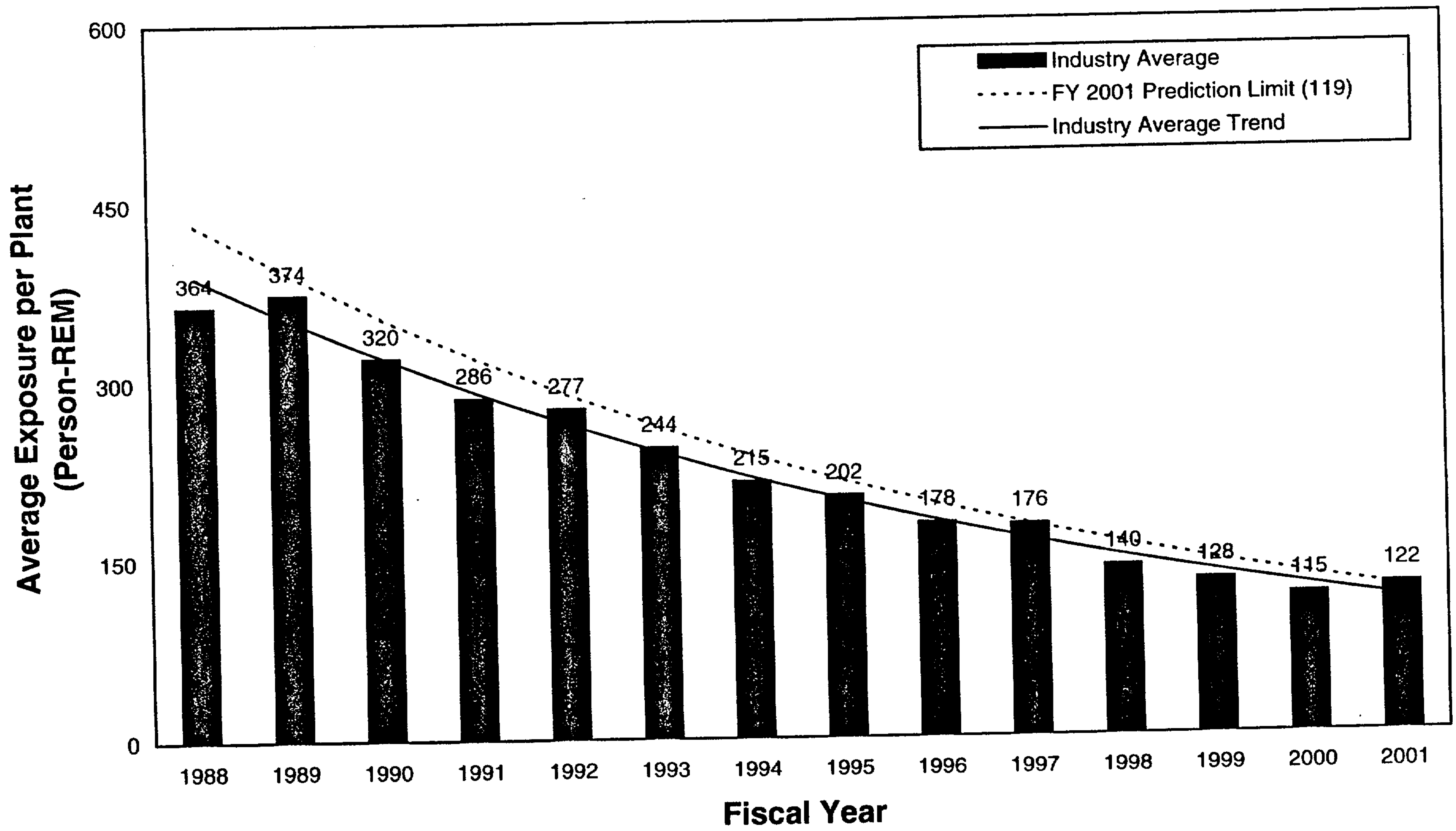
BACKUP SLIDES

Industry Trends

Automatic Scrams while Critical



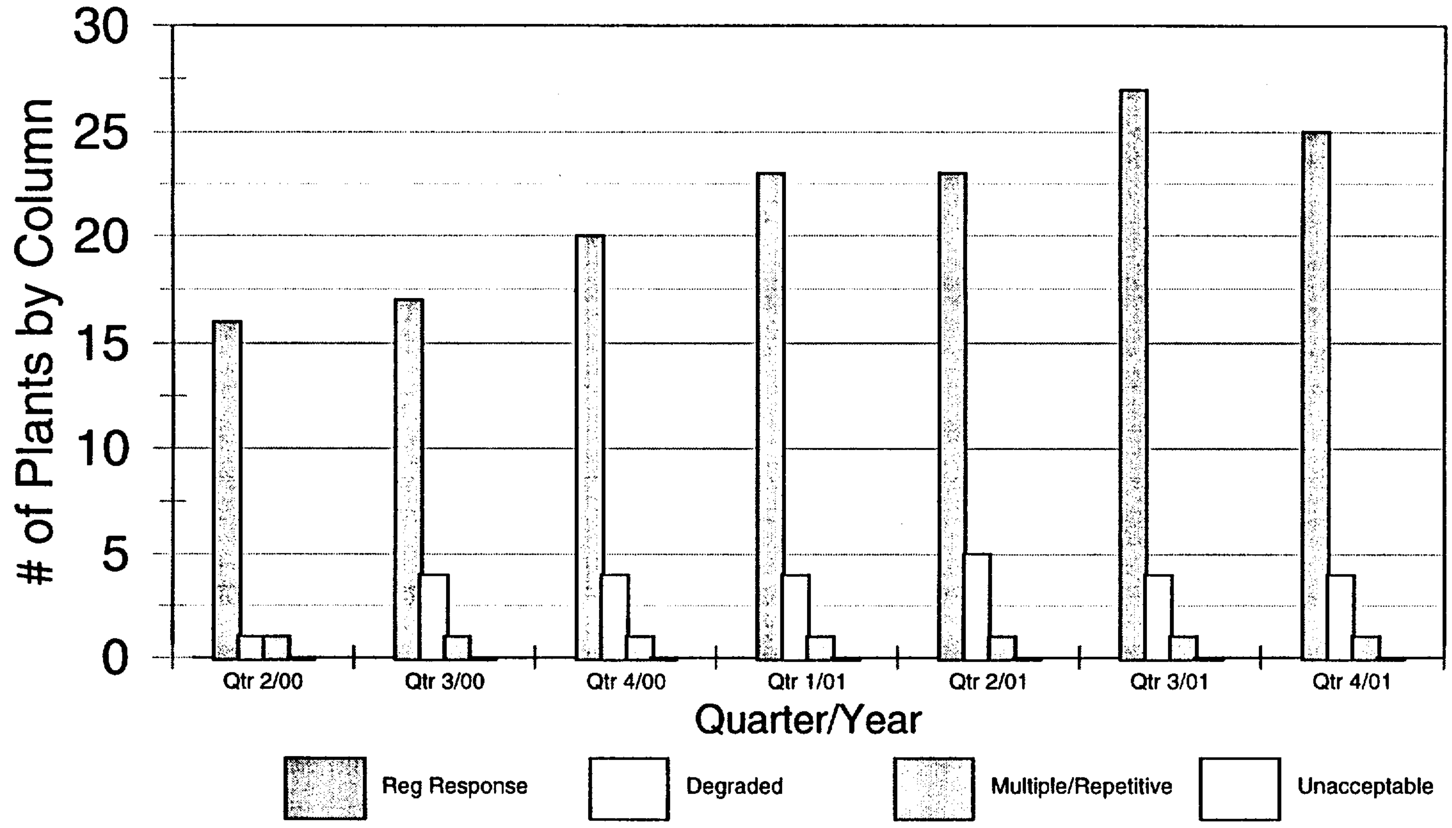
Collective Radiation Exposure



Action Matrix Trend Chart

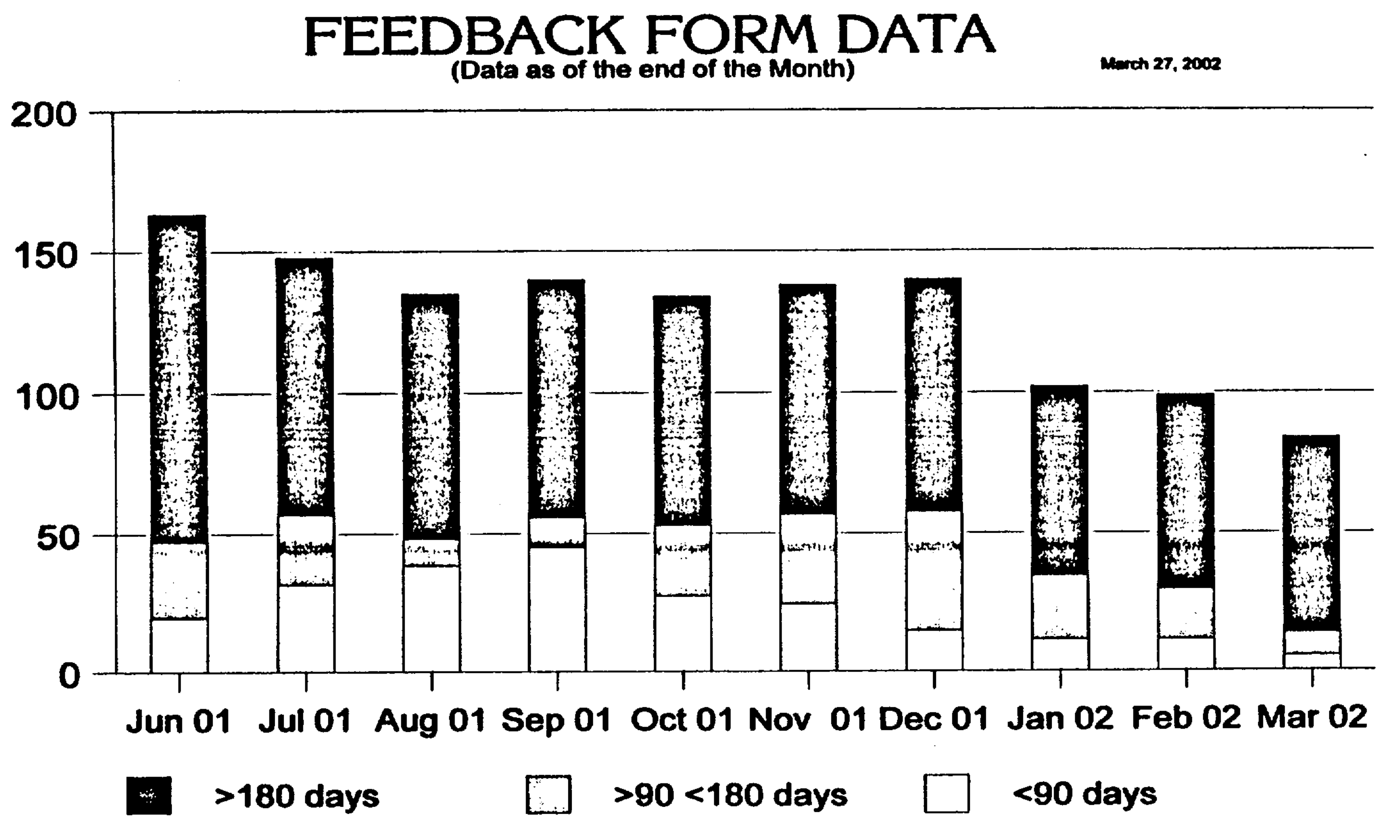
Action Matrix Trends

Apr 2000 - Dec 2001



1. This chart includes DC Cook units 1 and 2 beginning in Q2/2001.
2. Data current through March 18, 2002.

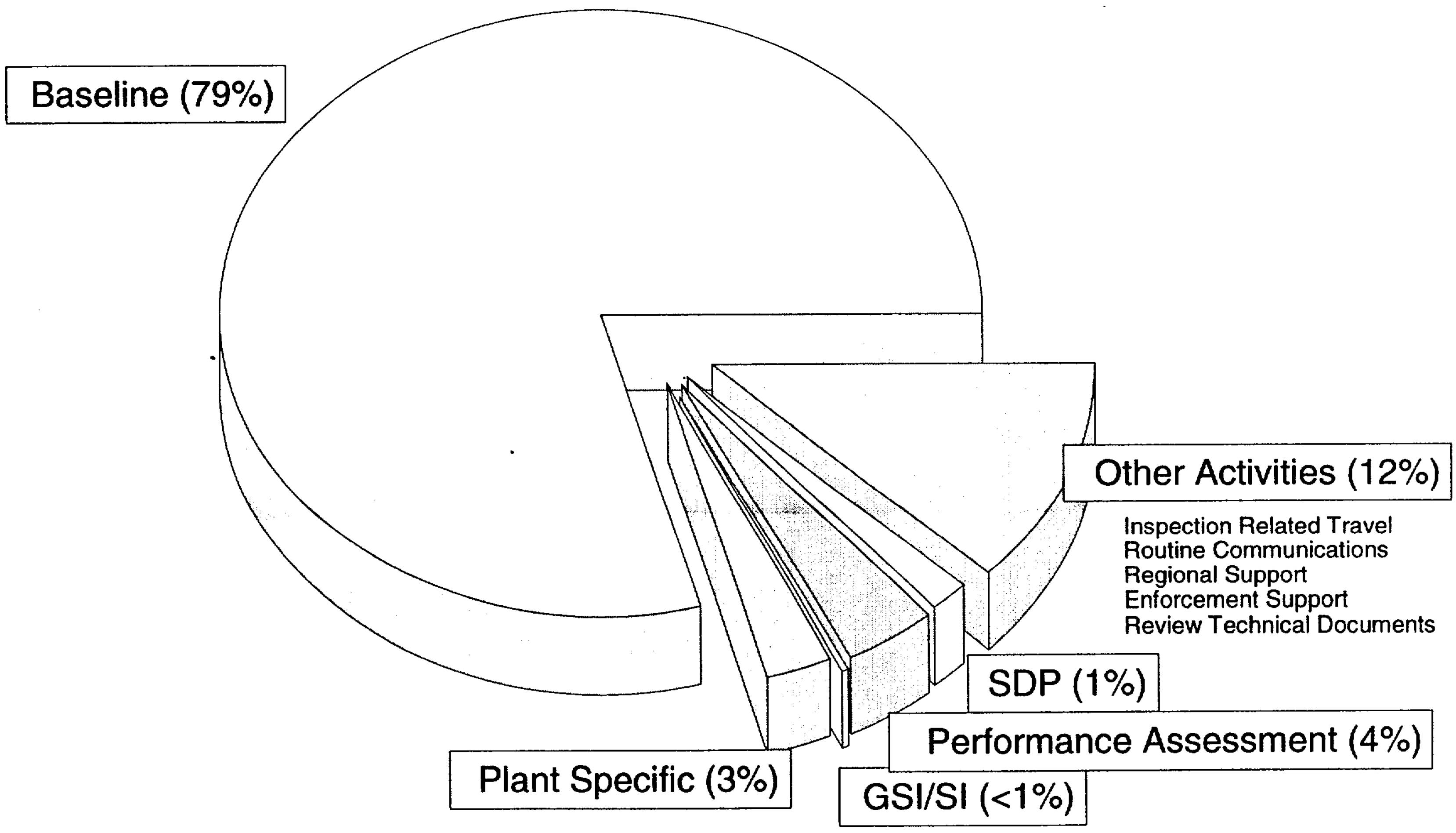
Feedback Form Data Chart


FEEDBACK FORM DATA
(Data as of the end of the Month)
March 27, 2002
200
150
100
50
0
Jun 01
Jul 01
Aug 01
Sep 01
Oct 01
Nov 01
Dec 01
Jan 02
Feb 02
Mar 02
>180 days
>90 <180 days
<90 days

Resource Charts

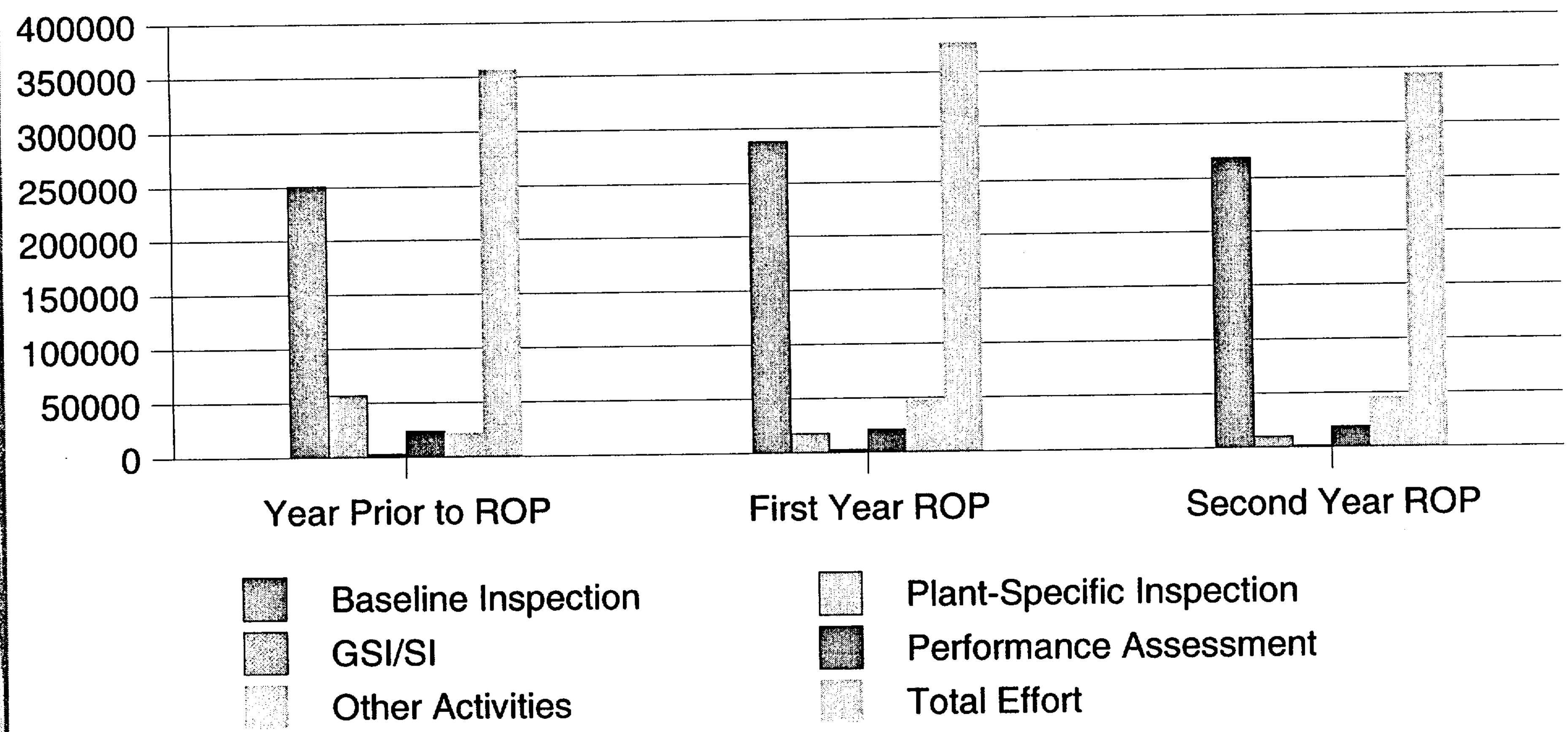
Distribution of ROP Expenditures

4/2/01-12/31/01



Inspection Resources Expended

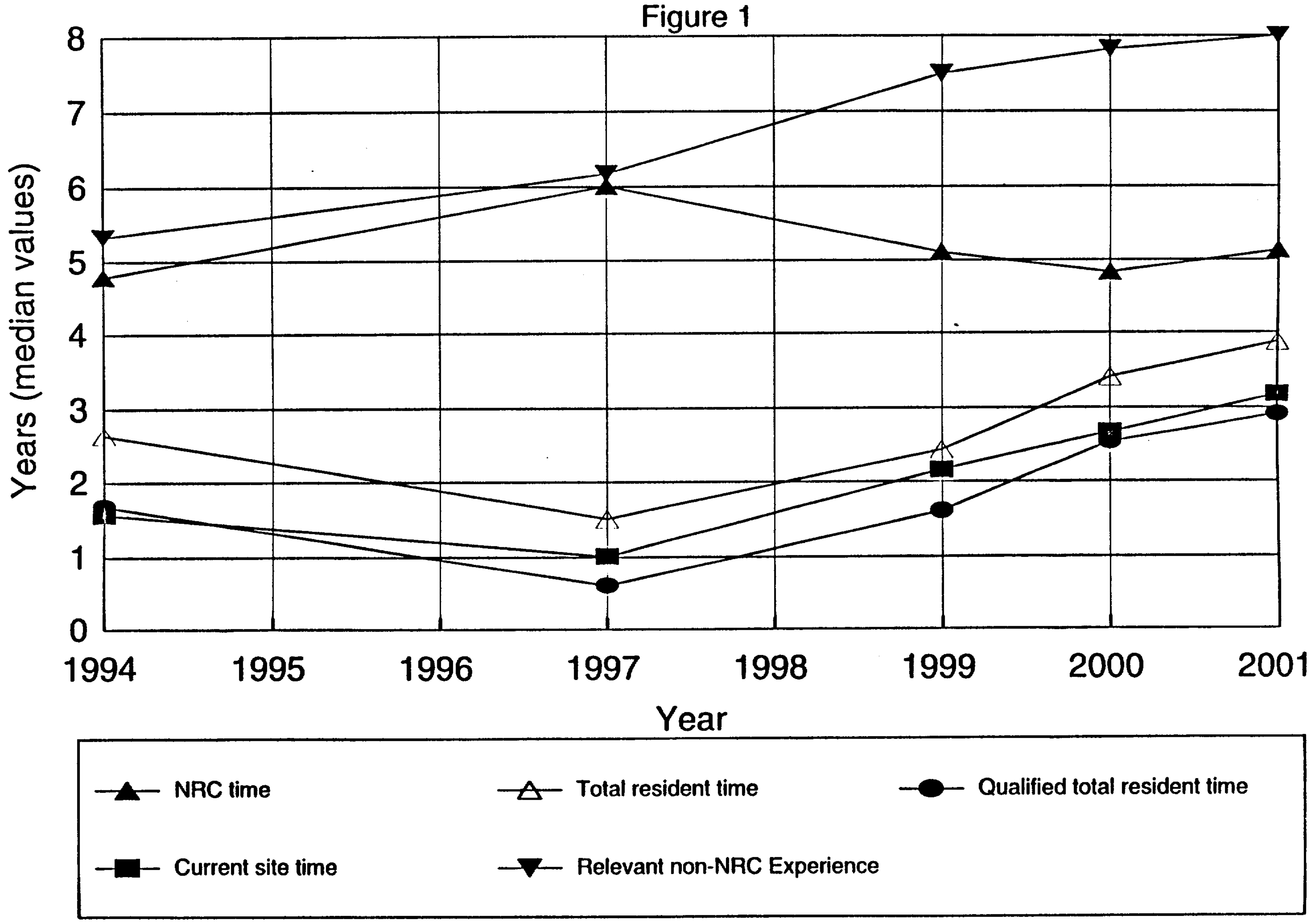
Total Staff Effort at Operating Power Reactors

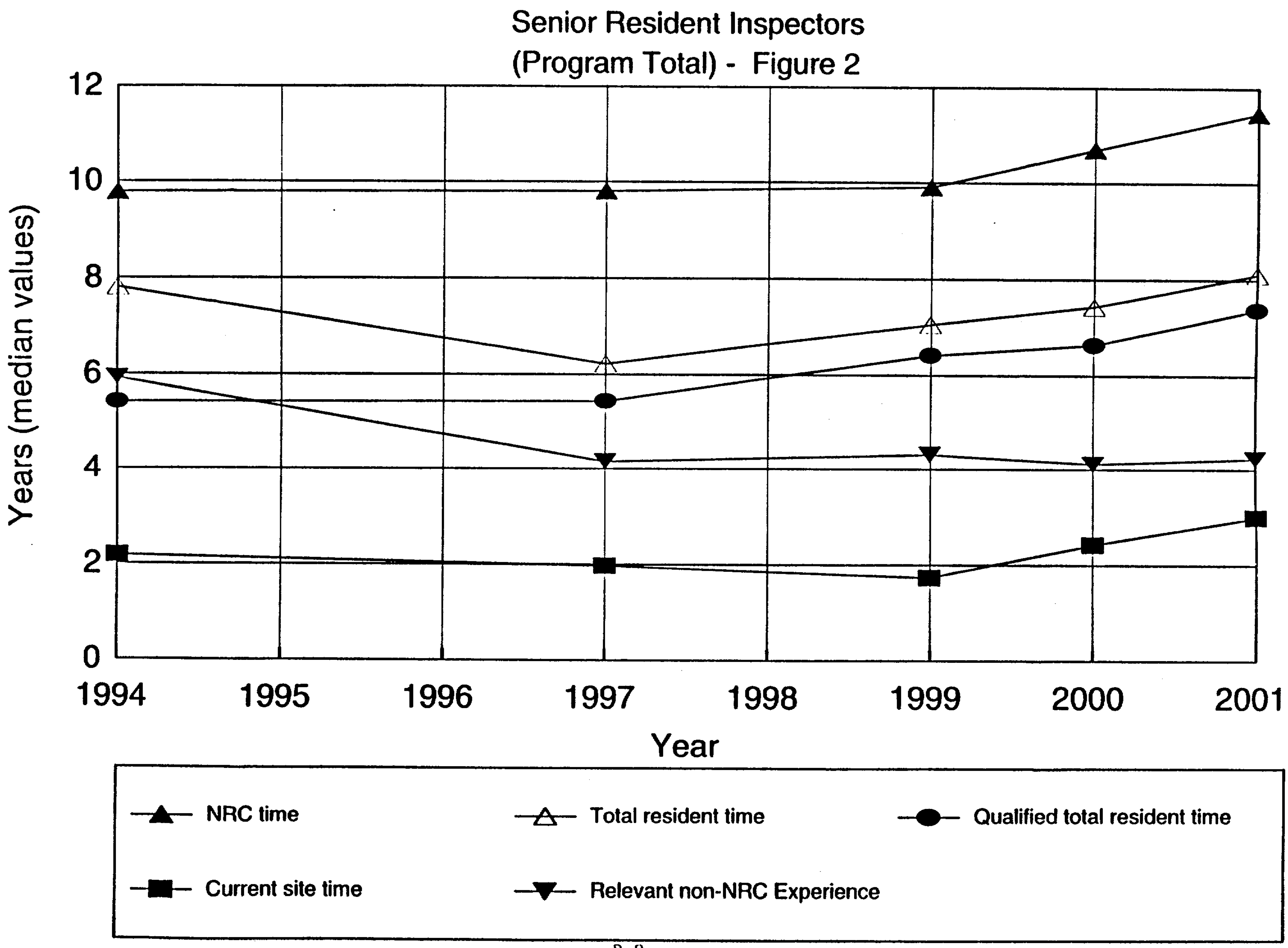


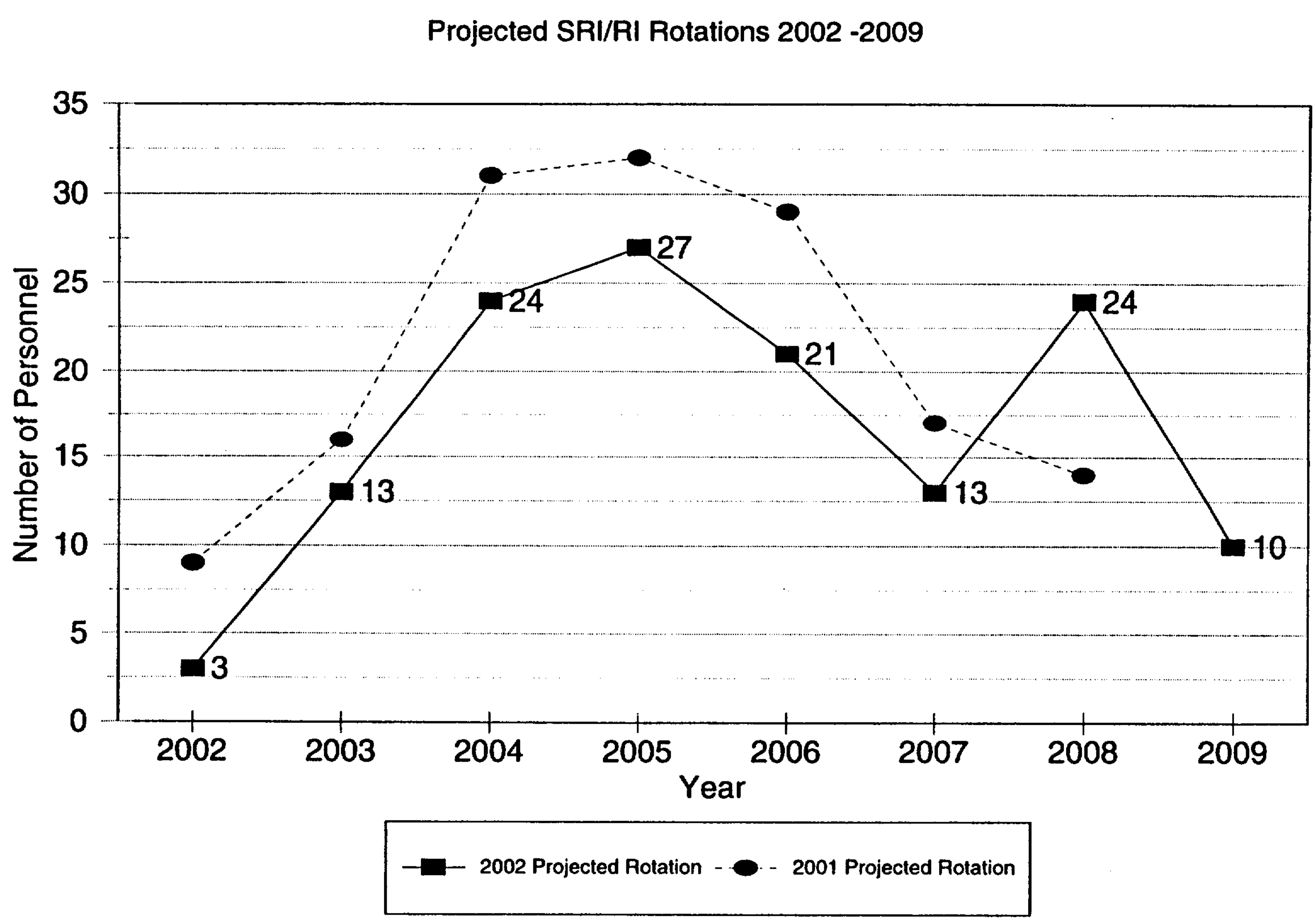
Resident Demographics Slide

Resident Inspectors (Program Total)

Figure 1




Senior Resident Inspectors
(Program Total) - Figure 2
12
10
8
6
4
2
0
Years (median values)
1994
1995
1996
1997
1998
1999
2000
2001
Year
NRC time
Total resident time
Qualified total resident time
Current site time
Relevant non-NRC Experience


Projected SRI/RI Rotations 2002 -2009
Number of Personnel
35
30
25
20
15
10
5
0
3
13
24
27
21
13
24
10
2002
2003
2004
2005
2006
2007
2008
2009
Year
2002 Projected Rotation
2001 Projected Rotation

ROP Implementation

Thomas C. Houghton
Nuclear Energy Institute

Performance Indicators

- PI Guideline and FAQ Process Effective
- Industry Supports NRC's PI Change Process
- Pilot to Revise Unavailability Indicators
  - Common Definition
  - Problems With Current Indicator
  - Benefits Will Outweigh Burden
  - Potential Stumbling Block

NEI

Licensee Self Assessment

- Supports NRC and Industry Goals of Safety, Efficiency, Burden Reduction, and Public Confidence
- LSA Is Not a New Concept
- Industry Initiatives in Self Assessment
- IIEP Recommended LSA
- Proposed Approach

NEI

Assessment Process

- ROP Provides Stability and Consistency to the Regulatory Environment
- Concur With Staff Conclusion on Cross-cutting Issues
- Graded Reset of Inspection Findings
- Scope of Verification of Old Design Issues

NEI

Significance Determination Process

- Superior Process for Assessing Issue Importance
- Retain Phase 2
- Can Be Enhanced by Licensee Involvement Earlier in Process
- Workshop on SDP "Lessons Learned"
- "Potentially Greater Than Green"

NEI

Conclusions

- Overall Process Tremendous Improvement Over SALP
- Safety Focus Much Improved
- Backlog of Enhancements to Work Through to Make It More Effective

NEI

Jeffrey A. Benjamin
Exelon

May 1, 2002

Overall Perspective

- Successful in Focusing Resources
- Risk Informing Performance Indicators (PI) Adds Value
- Significance Determination Process (SDP) Continues to be Complex

Observations

- **SDP Requires Significant Resources for Low Risk Issues -- Some Outcomes Inconsistent**
- **PI Data Collection is Rigorous**
- **Self Assessment Can Be Effectively Used to Offset Some Baseline Inspections**
- **End of Cycle Meetings Are Valuable**

Recommendations

- **Table-tops, Pilots and Training for SDP Proposed Changes**
- **Consider Amount of Data Collection Effort for New PIs**
- **Support Alignment of ROP and WANO Indicators**
- **Expedite Changes to Phase 2 Notebooks**
- **Implement SDP Strategy**

Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

THE REACTOR OVERSIGHT PROGRAM

David Lochbaum

Nuclear Safety Engineer

May 1, 2002

Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

Highlights

- **Industry trends program**
- **SDP**
- **Selectively risk-informed**
- **Commissioner's forecast**

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Industry Trends Program

- **Recommended additions:**

① **Trend causes for NRC SITs, AITS, and IITs conducted each year to flag emerging issues**

② **Trend safety during outages**

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SDP

- **Recommended fix:**

① **Impose a 90-day hard deadline for final SDP color assignments**

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Selectively Risk-Informed

- **Recommended fix:**

① **Include design errors in fault exposure time calculations for PIs**

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Commissioner's Forecast

- **Recommended fix:**

① **Revise NRC procedure for investigating near-misses to require formal evaluation against ROP**

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Wrap-up

UCS continues to believe that ROP is superior to SALP

UCS cannot point to a single shred of evidence to corroborate our belief

What is driving safety trends?

Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

April 18, 2002

Chairman Richard A. Meserve
Commissioner Nils J. Diaz
Commissioner Greta J. Dicus
Commissioner Edward McGaffigan, Jr.
Commissioner Jeffrey S. Merrifield
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: AGENCY ACTION REVIEW MEETING ON REACTORS - MAY 1, 2002

Dear Chairman and Commissioners:

The Union of Concerned Scientists (UCS) welcomes this opportunity to provide our views on the reactor oversight program as it is being implemented to monitor performance levels at US nuclear power plants. UCS continues to believe that the reactor oversight program is significantly better than the program it replaced. It provides more timely results that can be more easily accessed by external stakeholders.

While preparing these comments, we realized that there's not a single shred of evidence we can cite to support our position. In fact, the evidence strongly suggests that safety performance at US nuclear power plants has not been impacted—either positively or negatively—by the reactor oversight program. For example, there are literally dozens of safety parameters trended between 1988 and 2001 within the NRC staff's industry trends program.[1] We could not a discernible change in the slope of any safety parameter since the introduction of the reactor oversight program. It appears to us that safety trends are decoupled from whatever program NRC uses to oversee safety performance. Despite this realization, we continue to like the reactor oversight program much better than its predecessor. We only wish we had at least one hard fact to corroborate our belief.

As can be expected, the reactor oversight program has some flaws that need to be corrected, some aspects that are adequate but can be improved, and some parts that are working great. The majority of our comments fall into the first two categories. This binning does not accurately reflect the quality of the program. Instead, it reflects the simple fact that we focused on problem areas and therefore generated more comments in the first two categories. More review time would have enabled us to populate the third category with many more examples. We apologize up front to those NRC staffers whom we slighted by not finding the time to recognize their efforts (especially staffers who were involved in examples we included in categories one and two and were also involved in examples we could have included in category three).

[1] William D. Travers, Executive Director for Operations, Nuclear Regulatory Commission, to Commissioners, "Results of the Industry Trends Program for Operating Power Reactors and Status of Ongoing Development," SECY-02-0058, April 1, 2002.

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Our comments are grouped into the following areas:

- Industry trends program
- Significance determination process
- Risk notebooks
- Nielsen ratings holdover
- Color changes
- Manual Chapter 0350
- Selectively risk-informed
- Commissioner's forecast
- Inspection reports
- Program feedback

INDUSTRY TRENDS PROGRAM: The NRC staff's industry trends program for operating reactors provides useful insights across the nuclear industry.[2] The utility of this program should be enhanced in two ways. First, the program should attempt to flag emerging problem areas. One method for accomplishing this objective would be to monitor on an annual basis the reasons that NRC dispatches Special Inspection Teams, Augmented Inspection Teams, and Incident Inspection Teams. The resulting chart would resemble Figure A2-9 in SECY-02-0058 by providing a breakdown of the inspection cause code each year. From our own informal monitoring, UCS discovered that a minority of the teams dispatched between 1991 and 1996 investigated aging-related problems. A significantly higher percentage of the team inspections from 1997 to date were due to aging-related problems. This monitoring would complement rather than duplicate the existing monitoring programs. Aging-related problems could result in an automatic scram (Figure A2-5), in the loss of safety-related vital AC bus initiators (Figure A3-4), in loss of feedwater (Figure A3-12), and in several other problems tracked by existing metrics. But aging-related problems could cause many or all of these metrics to blip upward without raising a flag. The cause of team inspection parameter could flag cross-cutting issues such as aging or human performance sooner.

The second enhancement to the industry trends program involves safety during outages, primarily refueling outages. The existing metrics are almost exclusively tied to safety of plants when they are operating. Safety during shutdown could be monitored by trending the percentage (or number) of licensee event reports (LERs) related to outage activities. Some guidance would be needed to parse out the LERs from outages occurring because that's when components—like safety relief valves—can be tested. The objective would be to monitor performance during refueling outages. If such a metric could be developed, it would enable NRC to see if shorter refueling outages affected performance levels.

To curb the proliferation of trending parameters, UCS suggests eliminating the U.S. Nuclear Power Plant Critical Years plot (Figure A3-16). That would free up some space for the two new plots we recommend.

SIGNIFICANCE DETERMINATION PROCESS: An effective problem identification and resolution (PI&R) process for the reactor is a vital component of a sound nuclear safety program. The importance of the PI&R process is demonstrated by the fact that virtually every NRC inspection module evaluates the PI&R process while a separate NRC inspection specifically focuses on the PI&R process.

The PI&R process at the typical nuclear plant handles literally thousands of problems each year. A key aspect of the PI&R process is a prioritization system to determine which problems must be resolved now

[2] William D. Travers, Executive Director for Operations, Nuclear Regulatory Commission, to Commissioners, "Results of the Industry Trends Program for Operating Power Reactors and Status of Ongoing Development," SECY-02-0058, April 1, 2002.

and which problems can be resolved at some future date. This screening process serves both safety and economics by ensuring that risk-significant problems are addressed in a timely manner while permitting other problems to be resolved as resources allow.

Even on its worst day, the NRC would not tolerate any plant owner using a prioritization system that took six months or longer to determine whether a problem falls into the "fix right away" category or into the "fix it later" category. The plant owner's lame excuses about the dire need to gather information and study all angles of the problems would not be accepted. There is simply no justification for taking months to figure out if a problem must be fixed right away.

It is therefore incomprehensible that the NRC uses a prioritization system time-frame that it would not allow any plant owner to use. Since its inception, the SDP has been untimely. If every part of the SDP information flow worked perfectly, it would still be untimely. The SDP is hampering the reactor oversight program just as a flawed prioritization system would wreck any plant owner's PI&R process. The SDP must provide an answer within 90 days every time.

The NRC should follow the lead of the National Football League (NFL). A few years ago, the NFL adopted a policy of allowing its officials to review video replays to check calls made on the field. Given the number of camera angles available, careful dissection of all the available information could consume lots of time. Indeed, video replays during the first season often took longer than change of possession times-out and at times appeared to rival half-times in their duration. The NFL remedied this intolerable situation by altering the video replay process to speed it up. More importantly, the NFL put a time limit on the video replay reviews. If the official cannot see incontrovertible evidence within 90 seconds of watching replays to overturn the call, the call on the field stands as-is and the game resumes. Likewise, the NRC could allow its staff to review information for up to 90 days. If the plant owner hasn't provided enough incontrovertible information in that time to change the NRC staff's initial call, then it should stand and the NRC should resume playing its oversight game.

<u>RISK NOTEBOOKS</u>: The oft-cited excuse for the delay in getting to a final SDP Phase 3 color assignment is the NRC staff using risk notebooks that conservatively estimate risk while plant owners use safety assessments that more realistically estimate risk. It has taken many months of information exchanges to reconcile differences in risk output from these two processes. Seeking to resolve this problem as well as the problem of the public lacking access to current plant risk information, UCS explored the option of getting rid of the NRC's risk notebooks by having the plant owners put their safety assessments on the docket. The thought was that time would be saved by having the NRC staff and the plant owners start from the same point rather than from opposite sides of an apparently wide chasm.

Discussions with several industry representatives and NRC staffers yielded the consistent result of "no way." Jim Trapp, a senior risk analyst in NRC Region I, explained that plant owners use a wide variety of fault-tree and event-tree risk models that require extensive, intimate knowledge to be able to properly use them. He stated that the NRC lacks the resources to develop that background for each plant. UCS reluctantly concedes that replacing the risk notebooks with plant-specific risk assessments on the docket will not speed up the SDP.

> RELATED OBSERVATION: It is curious that the NRC staff would use results from plant-specific risk assessments that are baffling to all but highly-trained, frequent users in order to approve reductions in safety margin. This "guessing" may help explain why the NRC staff waived inspections of degraded equipment at Indian Point 2 and Davis-Besse. Rather than taking the time to understand the plant-specific risk assessment results, the NRC staff is forced to accept them as-

is in order to meet Congressionally-mandated schedular deadlines and the NRR official "frowning" on more than one set of requests for additional information (RAI).

NIELSEN RATINGS HOLDOVER: Chief among many faults of the Systematic Assessment of Licensee Performance (SALP) program was its subjectivity. UCS repeatedly ~~whined~~ commented that the NRC response to an event or condition at a plant was dictated more by headlines than by its true risk significance. We called it the Nielsen Ratings effect. Until very recently, we sincerely felt that the reactor oversight program hadn't done enough to reduce the Nielsen Ratings effect. The most risk-significant event under the reactor oversight program has not been the steam generator tube rupture at Indian Point 2 even though this is the only final RED finding issued to date. The dozens of headlines this event generated gave the NRC a black-eye. The NRC repaid the plant owner by giving it a RED badge of scourge. We feel it was revenge, not risk, causing NRC to issue this RED finding.

The inability of the owners of the Waterford, Quad Cities, Oyster Creek, and Vermont Yankee nuclear plants to adequately defend their facilities from mock attacks scheduled weeks in advance did not garner RED findings (at least not in final form). Mock intruders at these facilities were able to simulate the destruction of multiple pieces of equipment needed to cool the reactor core and prevent the release of radioactivity to the environment. But those facts resulted in only WHITE and YELLOW findings. A single broken steam generator tube, with all other emergency core cooling systems and containment barriers remaining fully operable, got a RED finding. Using the current crayon selection guidance, mock intruders able to simulate the destruction of a single steam generator tube on four out of four exercises would produce a non-cited violation or GREEN finding. It doesn't make much sense.

The preliminary RED finding recently issued to Point Beach for recirculation valve problems affecting the auxiliary feedwater pumps contradicts our views about the Nielsen Rating effect. Even if this finding is ultimately reduced to a YELLOW or WHITE finding, the NRC staff was able to identify a RED finding absent an actual event or a flurry of media reports. The Point Beach finding doesn't explain why a single broken steam generator tube at Indian Point 2 warranted a RED when the complete destruction of a target set at Quad Cities warranted a WHITE, but it suggests the reason for disparate colors may not be external factors as we presumed. As discussed in the sections titled "Color Changes" and "Inspection Reports," improved communication by the NRC staff might help us better understand the color assignments.

COLOR CHANGES: There have been times when the final color assigned to a finding was less severe than the preliminary color. In these cases, the NRC staff's reports documented the basis for the assigned color. For example, the report accompanying the issuance of the preliminary color explained what the staff considered in reaching that assignment while the report for the final color explained the basis for that assignment. But there hasn't been a consistent practice in the final report of explaining why the staff changed its mind. Without this "bridge," it's difficult to view two different staff positions and derive why the less severe of the two was chosen. When the staff assigns a different final color, they should document in the final report the new and/or revised information obtained since the preliminary color assignment that warranted the color change.

MANUAL CHAPTER 0350: The role of Manual Chapter 0350 within the reactor oversight program continues to baffle UCS. The applicability of this NRC directive seems straight-forward:

> **0350-03 APPLICABILITY**
>
> This manual chapter may be implemented following a plant shutdown as a result of significant performance problems and/or after a significant plant event.

For the purposes of this inspection manual chapter (IMC), the following are definitions of specific terms used herein.

Significant performance problems. Those problems that meet the entry conditions for the Multiple/Repetitive Degraded Cornerstone or the Unacceptable Performance columns of the Action Matrix contained in IMC 0305, "Operating Reactor Assessment Program."

Significant plant event. Any plant event that is categorized as risk significant as determined by the results of an evaluation of the conditional core damage frequency (CCDP), or the conditional core damage frequency (CCDF) as outlined in IP 71153, "Event Followup."

Issues with risk significance. Any inspection findings or performance indicators (PIs) that are categorized as having risk significance as determined by the results through the SDP process as "white," "yellow," or "red."

This manual chapter and its appendix give general guidance for NRC oversight of plant restart on the basis of previous experience and should be used for developing the Restart Checklist.

Indian Point 2's steam generator tube failure event in 2000 and Davis-Besse's reactor vessel head damage event in 2002 appear to satisfy the applicability thresholds. Indian Point 2 experienced a plant shutdown following a significant plant event (RED finding) at a time when it was experiencing significant performance problems ($88,000 civil penalty issued shortly after event for another safety problem). Yet Manual Chapter 0350 was not invoked. Davis-Besse is currently shutdown with an issue having risk significance (color yet to be determined, but clearly at least dark GREEN). Yet Manual Chapter 0350 has not been invoked as of April 16th.

Why is the NRC so reluctant to use Manual Chapter 0350?

Under what conditions might Manual Chapter 0350 be used (if not for the reasons listed within the directive)?

Assuming that the NRC staff can effectively and efficiently track the issues requiring resolution prior to restart without invoking Manual Chapter 0350, how does the staff conform with Objective 02.04 of the manual chapter: "To provide a mechanism for communicating issues and corrective actions to the public and other external stakeholders"?

Why does the Director of the Office of Nuclear Reactor Regulation, in conjunction with the Regional Administrators, decide when to invoke Manual Chapter 0350? Shouldn't the Regional Administrators make this decision exclusively?

SELECTIVELY RISK-INFORMED: The reactor oversight program is selectively risk-informed. When risk-informing something allows a non-GREEN finding to be made GREEN, the NRC staff gets pressured nby industry to risk-inform the ROP. When un-risk-informing something allows a non-GREEN finding to be made GREEN, the NRC staff gets pressured by industry to un-risk-inform it. The logic for deciding whether something is risk-informed or not cannot continue to be whatever it takes to get a GREEN finding.

An example of risk-informing to get GREEN is the physical protection (i..e., security) significance determination process (PPSDP). After the Quad Cities OSRE findings initially came out YELLOW/RED, the industry balked and urged the NRC staff to risk-inform the PPSDP. The industry contended that the

PPSDP was unrealistic because it assumed an initiating event frequency of 1.0, which caused almost any finding during an OSRE to come out YELLOW/RED. So, the PPSDP was "risk-informed" and the Quad Cities finding went from YELLOW/RED to WHITE.

An example of un-risk-informing to get GREEN is the treatment of design basis problems in performance indicator space. When a test determines that safety equipment cannot perform its required function, half of the time back to the last test (T/2) is defined as the fault exposure time and used in the equation that determines the color assignment for the associated performance indicator. But design errors are seldom discovered during routine testing. They are formally excluded from the performance indicator calculation:

> Failures that are not capable of being discovered during normal surveillance tests: These failures are usually of longer fault exposure time. These failures are amenable to evaluation through the NRC's Significance Determination Process and are excluded from the unavailability indicators. Examples of this type are failures due to pressure locking/thermal binding of isolation valves or inadequate sizing/setting under accident conditions (not under normal test conditions).[3]

Consider for a brief moment the absurdity of the current process. It a safety widget fails during a surveillance test at conditions for which it is not needed, fault exposure time is calculated. But if that same safety widget is found to have a design error such that it would fail under accident conditions (i.e., the only darn reason that it is installed in the plant), fault exposure time is not calculated.

Design errors typically have longer durations than surveillance test intervals. Thus, the T/2 duration for a design error would be greater and it would have greater impact on the performance indicator calculation. The risk-informed approach would be to treat design errors the same way as test failures. Risk is the product of probability and consequences. The consequences of a design error and test failure are identical — safety equipment won't function as required when needed. The probability of a design error and test failure depends on its fault exposure time — the longer the T/2 duration, the greater the probability. With equal consequence and greater probability, design errors thus have greater risk. But the industry didn't like getting non-GREEN performance indicators for design errors, so they pressurized the NRC staff to exclude them from the calculation via an un-risk-informed process.

Industry laggards no longer deserve to be shielded from their own mistakes. Following the Millstone debacle, the NRC issued Information Notice 96-17 to every nuclear plant owner in America describing in detail the design errors found. In October 1996, the NRC issued a 50.54(f) letter to every nuclear plant owner in American (except Millstone's) requiring them to respond under oath or affirmation how they were certain that their plants were being operated in conformance with their design bases. Around the same time, the NRC gave plant owners a year-plus amnesty period for finding design basis problems without fear of enforcement sanctions. The industry had ample opportunities to flush out and fix design errors. Industry leaders have already devoted the resources for their facilities. Industry laggards provided only lip service to the Info Notice and subsequent 50.54(f) letter. It's unfair to the leaders for the NRC to continue giving the laggards a free ride. It's unfair to the public for the NRC to give either leaders or laggards a free ride. Fairness dictates that design errors should be treated the same way as test failures. The fault exposure time for design errors must be included in the performance indicators.

COMMISSIONER'S FORECAST: During a Commission briefing on the reactor oversight program during its development (believed to be the one conducted on January 20, 1999, but this cannot be confirmed because the transcript is no longer available on the NRC's weblite), Commissioner McGaffigan

[3] Nuclear Energy Institute, NEI-99-02 Revision 2, "Regulatory Assessment Performance Indicator Guideline," November 19, 2001, as endorsed by NRC Regulatory Issue Summary 2001-25.

commented on the issue of leading vs. lagging indications and asked the panel—which included UCS—if the ROP would detect the next D C Cook. UCS responded with an answer to the effect that the revised reactor oversight program made it less likely for a D C Cook to occur. Our answer may be correct, but it's little consolation because Davis-Besse had all-GREEN boards when its event happened as shown in Figures 1 and 2. The Commissioner's line of questioning seems validated in that the reactor oversight program was unable to foreshadow serious problems at Davis-Besse.

In some ways, the reactor oversight program is like driving a car down a highway using only the rear-view mirror. You cannot dodge things in the road ahead, but you can see what you ran over.

To us, the best way to address Commissioner McGaffigan's concerns is to revise the NRC's procedure[4] for investigating near-misses to formally require an evaluation against the reactor oversight program. This evaluation would address questions such as the following:

1. Would lower thresholds for a performance indicator have flagged declining performance sooner?
2. Is a new performance indicator needed to monitor performance in this area?
3. Would more frequent baseline inspections have flagged declining performance sooner?
4. Are additional baseline inspections needed?
5. Should the resident inspectors have seen signs of trouble coming?
6. Does the Action Matrix need to be revised to trigger prompter NRC response to signs of declining performance?

When the evaluation concluded that the answer to one or more of these questions was positive, it would not automatically cause a change to the reactor oversight program. Instead, it would cause feedback to the NRC staff responsible for the reactor oversight program for handling via the established change process.

The current procedure for incident investigation alludes to the evaluation of regulatory oversight processes. The procedure should be revised to accent that role. For example, the procedure could specify that a staffer from the NRC's program office responsible for the reactor oversight program be named to the Incident Inspection Team with the specific assignment of answering questions like the ones proposed above. The procedure should also formalize the feedback process when the Incident Inspection Team or Augmented Inspection Team or Special Inspection Team recommends enhancements to the reactor oversight program

Near-misses provide invaluable insights. The reactor oversight program would benefit from the NRC's investigations into near-misses formally evaluating whether revisions to the program are warranted.

[4] Nuclear Regulatory Commission, Management Directive 8.3, "NRC Incident Investigation Program," March 2001.

Figure 1: Davis-Besse Performance Indicators

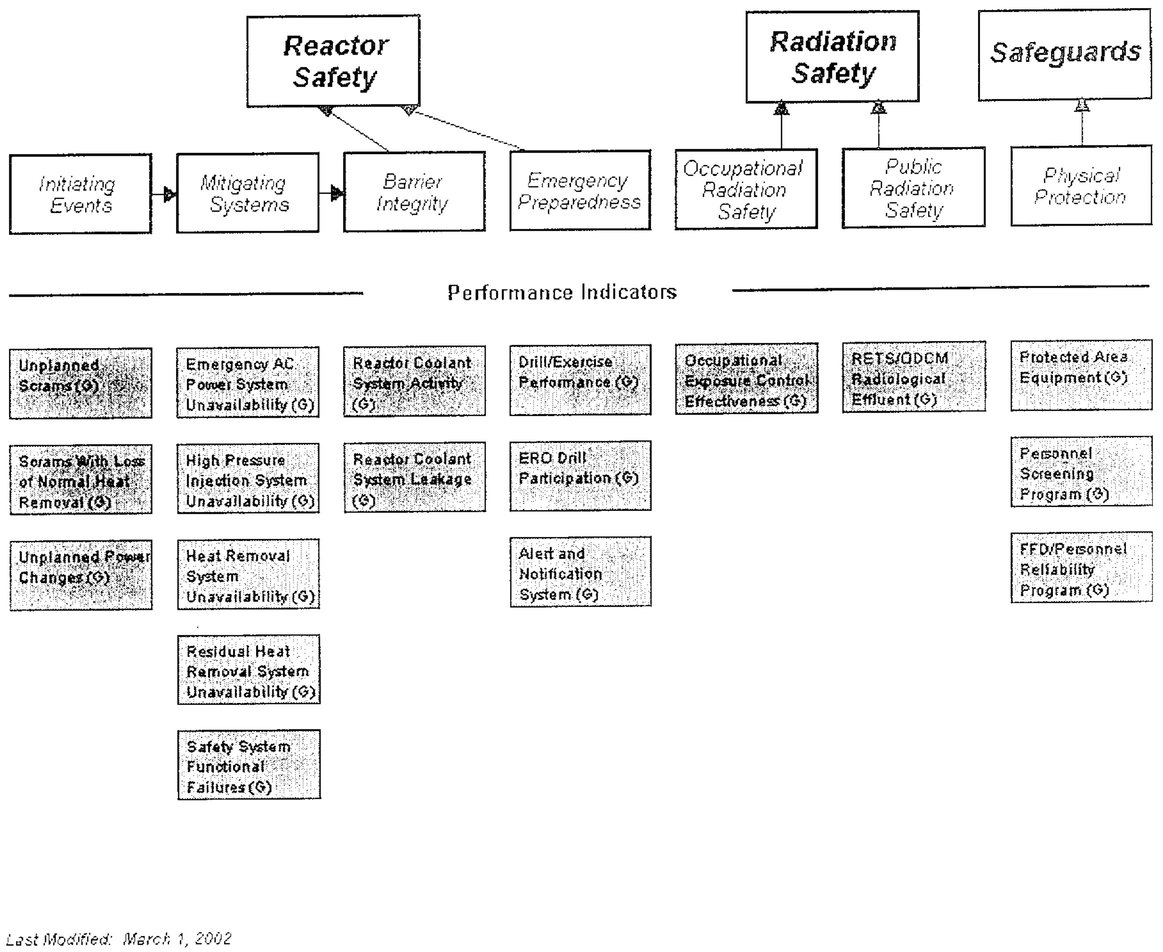
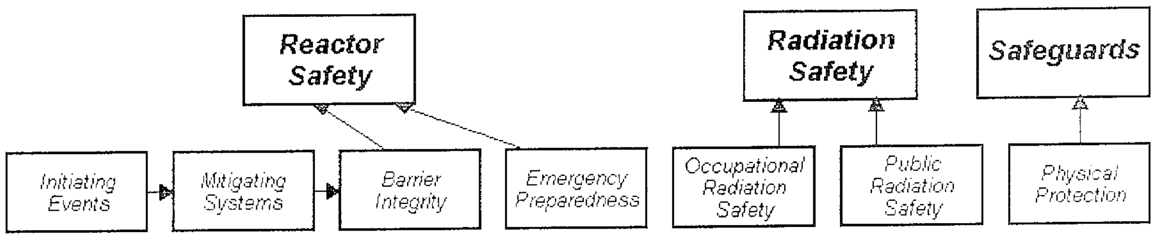


Figure 2: Davis-Besse Inspection Findings



Most Significant Inspection Findings

	Initiating Events	Mitigating Systems	Barrier Integrity	Emergency Preparedness	Occupational Radiation Safety	Public Radiation Safety	Physical Protection
4Q/2001	No findings this quarter	G	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter
3Q/2001	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter
2Q/2001	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter
1Q/2001	G	G	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter

Miscellaneous findings

Additional Inspection & Assessment Information

- Assessment Reports/Inspection Plans:
  - 4Q/2001
  - 3Q/2001
  - 2Q/2001
  - 1Q/2001
- Cross Reference Of Assessment Reports
- List of Inspection Reports
- List of Assessment Letters/Inspection Plans

Last Modified: March 1, 2002

INSPECTION REPORTS: One of the under-emphasized benefits from the reactor oversight program was a new format for inspection reports. The new format was intended to improve NRC staff efficiency by reducing resources expended developing the reports and to improve the utility of the reports. UCS hasn't assessed the effect of the revised format on staff efficiency, but we have noticed an overall improvement in the quality of the inspection reports. The typical report today does a much better job describing what the inspectors looked at, what they found, and how they assessed those findings. An outstanding example was the report released by Region IV on the special team inspection into the electrical fire and loss of power to vital and non-vital 4-kV buses that occurred at Diablo Canyon in May 2000.[5] This report did an excellent job of answering the "who, what, when, where, why" questions about this event in an understandable way. While this report was singled out, many other inspection reports—including many issued within the past year—cover all the bases just as well.

At the other end of the spectrum was the report released at roughly the same time by Region II on the special team inspection into the reactor trip with complications that occurred at McGuire in May 2000.[6] The second section of this report stated:

> "The initial risk significance assessment by the Region II senior reactor analysts indicated that there was sufficient risk increase to consider the event for more than the baseline inspection program. The major contributors to risk increase were the introduction of potential common-mode failure mechanisms (i.e., air binding of introduction of foreign material from RN [RN stands for Service Water at McGuire for some reason] supplies) when all but the RN system was rendered unavailable as the water source to the auxiliary feedwater (CA) pumps."

Oddly enough, the remaining ten pages of the report never mention common-mode failure mechanisms again. There's zero discussion of the potential for air binding or foreign material effects. This report and a small number of inspection reports like it are woefully inadequate.

PROGRAM FEEDBACK: An outstanding element of the reactor oversight program is its many formal feedback mechanisms. In addition to answering the important question of whether the program is meeting its expectations, these mechanisms reflect the realization that the program is a pathway and not a destination. These feedback mechanisms encourage internal and external stakeholders to view the program with critical eyes and identify areas for improvement.

An example of this feedback is an assessment conducted by Region IV of conditions at the Cooper Nuclear Station.[7] Region IV examined how the reactor oversight program would handle a number of risk-significant issues identified at Cooper. They concluded that the reactor oversight program adequately handled the majority of the issues, but under-responded to a few issues. Region IV proposed a process to remedy the shortfall.

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[5] Ken E. Brockman, Director - Division of Reactor Projects, Nuclear Regulatory Commission, to Gregory M. Rueger, Senior Vice President and General Manager, Pacific Gas and Electric Company, "Diablo Canyon Inspection Report No. 50-275/00-09; 50-323/00-09," July 31, 2000.

[6] Charles R. Ogle, Chief - Reactor Projects Branch 1, Nuclear Regulatory Commission, to H. B. Barron, Vice President - McGuire Station, Duke Energy Corporation, "McGuire Nuclear Station - NRC Special Inspection Report No. 50-369/00-08," June 29, 2000.

[7] Ken E. Brockman, Director - Division of Reactor Projects, Nuclear Regulatory Commission, to William M. Dean, Chief - Inspection Programs Branch, Nuclear Regulatory Commission, "Agency Response to Degraded Conditions at Power Reactors," September 20, 2000.

A more recent but equally commendable example was an assessment conducted by Region III of 51 inspection findings from 26 inspection reports.[8] This team concluded that there were signs of over-reporting, of under-reporting, and of inconsistent reporting. UCS did not assess these 26 inspection reports in parallel and therefore cannot affirm or refute those conclusions. Nevertheless, the conclusions appear to call them as they see them with no pre-conceived notions. The memo recommended procedural and training changes to improve future performance. Thus, it appears to UCS that this self-assessment, along with many others like it, promote consistency and improved evolution of the ROP.

There are many other examples of formal feedback from both internal and external stakeholders. Feedback is extremely important and should continue to enhance the reactor oversight program.

On that note, UCS appreciates this opportunity to provide feedback on the program.

Sincerely,

David Lochbaum
Nuclear Safety Engineer
Washington Office

[8] Christine A. Lipa, Chief - Reactor Projects Branch, Nuclear Regulatory Commission, to Geoffrey E. Grant, Director - Division of Reactor Projects, "Self-Assessment Results: Inspection Report Thresholds," December 3, 2001.

NRC Reactor Oversight Process (ROP) Perspective From Commonwealth of Pennsylvania

Rich Janati, Chief
Division of Nuclear Safety
Pennsylvania Department of Environmental Protection

Background

- There are nine reactors at five sites in Pennsylvania (PA); nuclear power plants provide about 40 percent of the electricity in PA.
- PADEP has implemented a comprehensive nuclear safety and environmental monitoring program at PA nuclear power plants.
- PADEP nuclear safety staff observe selected NRC Region 1 inspections at PA nuclear power plants.
- The following comments are based on PADEP participation in the ROP workshops and public meetings, interactions with the NRC inspectors and communications with members of the public.

NRC Inspection/SDP Findings For PA Nuclear Plants (April 2000-March 2002)

Total Number of Findings	**137**	
Number of "Green" Findings	**130**	**(95%)**
Number of "White" Findings	**7**	**(5%)**
One Potential "Yellow" Finding	**1**	

Goal 1 – Maintain Safety

- **There are no signs of declining plant safety at any of the PA nuclear power plants since the implementation of the new ROP.**
- **NRC should continue to assess the long-term effectiveness of the ROP and validate the ROP assumptions, particularly as it relates to cross-cutting issues.**
- **The public is concerned that the reduction in the number of NRC resident inspectors and baseline inspection hours, combined with the industry staffing reductions, could adversely affect plant safety.**

Goal 2 – Enhance Public Confidence

- **The ROP provides a more scrutable, objective and predictable process for evaluating individual plant performance.**
- **NRC has been actively seeking stakeholders input to further improve the ROP, but the level of participation by the general public has been very low.**
- **NRC needs to develop and implement an effective mechanism to receive public input continuously and on a plant specific basis.**
- **NRC resident inspectors should play a pro-active role in the NRC's public involvement activities within the local community.**

Goal 2 – Enhance Public Confidence (continued...)

- **The posting of plant specific PIs and assessment information on the NRC Website can help improve public confidence in the process.**
- **Unnecessary changes to the ROP may reduce public confidence in the process.**

Goal 3 – Improve Efficiency and Effectiveness

- **ROP inspections focus on areas that are risk significant.**
- **PIs have helped licensees focus their attention on areas or programs that may need improvements.**
- **Developments of Risk-based PIs should help improve the ROP effectiveness.**
- **NRC response time for some inspection findings are slow and has hindered the effectiveness of SDP.**
- **Additional time and data is needed to assess the ability of the ROP to detect, in a timely manner, adverse trends in the cross-cutting areas.**

Goal 4 – Reduce Unnecessary Regulatory Burden

- **Licensees are spending less time responding to issues of low safety significance (i.e., non-cited violations).**
- **SDP is a resource-intensive process; the lack of standardized risk analysis tools has complicated the process.**
- **Recommend periodic surveys of NRC regional staff and licensees to determine whether the ROP is making process toward achieving this goal.**

Plant Security

- **PADEP requests that NRC have a government representatives-only workshop, to share information with states on:**
  - **General follow-up to NRC Threat Advisories**
  - **Review(s) of plant security and design basis threat**
  - **Security events or threats at specific nuclear power plants**
  - **Status of NRC performance-based evaluations**

- **Information provided could be classified as safeguards, with signed non-disclosure if needed.**