



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 26, 1994

MEMORANDUM TO: Ellis W. Merschoff, Team Leader
Cooper Special Evaluation Team
Office for Analysis and Evaluation
of Operational Data

FROM: Anthony T. Gody, Chief *Anthony T. Gody*
Inspection and Regulatory Criteria Branch
Program Management, Policy Development
and Analysis Staff
Office of Nuclear Reactor Regulation

SUBJECT: COOPER PERFORMANCE EVALUATION TREE

The Inspection and Regulatory Criteria Branch (IRCB) has completed a performance evaluation tree for the Cooper Nuclear Station using NRC inspection reports, licensee event reports (LERs), Region IV morning reports, licensee 10 CFR 50.72 reports, enforcement actions, SALP reports, and allegation documents from about August 1, 1993, through July 26, 1994. The panel Chairman also attended the restart meeting with the licensee in NRR on July 29, 1994. This evaluation was conducted to gain further understanding regarding the performance level of the Cooper Nuclear Station for the upcoming Special Evaluation Team (SET) assessment.

The overall performance of the Cooper Nuclear Station was rated as poor. The results of the evaluation are depicted on the colored graphic of Attachment 1. The details of the evaluation are contained in the narrative of Attachment 2. The areas of major concern were in self-assessment, corrective actions, training, procedures and procedural adherence, event assessment, and equipment performance. The functional areas of Operations and Maintenance were of concern. Corrective actions were weak across all functional areas. Engineering was considered adequate but weak. An engineering team inspection scheduled for June 1994 was deferred. Consequently, a detailed, recent assessment was not available for review. The licensee's performance was strongest in Radiological Controls, but corrective action weaknesses were also identified in this area. There was no radiological controls outage inspection in the materials reviewed. In conducting the assessment, the panel noted common themes as well as contradictions in the review materials. The panel recommends that the SET examine these areas to develop a better understanding of the performance and programmatic implications. These areas are:

- Procedure adequacy and adherence
- QA and oversight review committee involvement
- Post-trip review and root cause analysis

clz

Contact:
Michael T. Markley, CFES/IRCB/NRR
504-1011

9409010080 940826

COPY

- Self-assessment and problem resolution*
- Surveillance program
- Operating experience review*
- Design bases documentation*
- Control and use of vendor manuals*
- Engineering support*
- * Denotes areas of contradictory assessment from the October 1993 evaluation.

The performance evaluation tree process has subjective elements. Although it is based on factual information, the ratings must be determined using an arbitrary scale. Because of this subjective nature, the evaluation is marked as "pre-decisional."

In October 1993, the Performance and Quality Evaluation Branch (RPEB) conducted a performance evaluation tree assessment of Cooper in preparation for the SMM Pre Briefing. The results were significantly different from those in this assessment. A comparison of the two assessments is provided as Attachment 3 to this report. The previous assessment and color graphic are provided as Attachment 4.

If you have any questions regarding this assessment, please call me at 504-1257.

Attachments: As stated

- cc: W. Russell
- f. Miraglia
- A. Thadani
- R. Zimmerman
- f. Gillespie
- J. Roe
- f. Adensam

DISTRIBUTION:

Central Files MJohnson DSullivan
 IRCB R.F. MDavis
 CFES R.F. SSanchez

DOCUMENT NAME: H:\SECY\COOPTREE.MEM

To receive a copy of this document, indicate in the box "C" = Copy without attachment/enclosure "E" = Copy with attachment-enclosure "N" = No copy

OFFICE	IRCB:CFES	SC:IRCB:CFES	BC:IRCB:CFES			
NAME	MMarkley:jp	LRPlisco	ATGodwin			
DATE	1/1/94	8/26/94	8/26/94	1/1/94	1/1/94	1/1/94

PERFORMANCE EVALUATION TREE NARRATIVE COOPER

I. INTRODUCTION

The staff developed the performance evaluation tree process as an assessment tool to independently evaluate licensee performance. Its purpose is to provide additional insights for NRC management regarding actual or potential declining licensee performance. The assessment covers the broad range of licensee activities with particular emphasis on identifying problem areas, areas of good performance and implications of management effectiveness. Historically, performance evaluation trees have been completed in support of Senior Management Meeting Pre-Briefings. A performance evaluation tree was conducted prior to each of the last 4 Diagnostic Evaluation Team assessments (DETs).

II. PERFORMANCE EVALUATION TREE PROCESS

The tree consists of 60 Category evaluations within 3 major areas of performance - Management, Organization and Equipment. The Organization area consists of 5 Sub-Areas - Operations, Maintenance, Engineering, Control of Quality and Radiological Controls. Licensee performance is evaluated for each Category and an upward integration of individual assessments generates the overall assessment of performance.

A four person panel is formed to individually evaluate approximately a year's plant-related data. The panel convenes and develops a consensus assessment for each Category. The results are represented by a graphic display and written report.

The graphic display of sixty-nine boxes is arranged, colored and marked to facilitate ease of use and understanding. Each box is colored to illustrate a graphic performance representation: green for GOOD, yellow for ADEQUATE, red for POOR, and blue for NOT RATED because of insufficient information. The nine Area and Sub-Area boxes are marked with black arrows to further distinguish licensee performance as LOW, AVERAGE or HIGH within the overall rating.

Performance is considered GOOD when the licensee has demonstrated strategy, structure and execution for safe operation of the plant in the Category under consideration. Performance is considered ADEQUATE when the licensee has demonstrated weakness in strategy, structure or execution, but still provided for safe operation of the plant. Performance is considered POOR when the licensee demonstrated the need for improvement in strategy, structure or execution to continue safe operations.

The written report provides the qualitative assessment of licensee performance. The panel's assessments are subjective and based on the cumulative experience and training of the individuals. Judgements are made based on available input documentation, and insights revealed through the review and discussion.

III. COOPER EVALUATION

The Cooper Performance Evaluation Tree was developed to provide additional insights for the upcoming Special Evaluation Team (SET) inspection. Four staff members of the Inspection and Regulatory Criteria Branch (IRCB) formed the panel. The period of consideration was from August 1, 1993, to July 26, 1994. The evaluators reviewed documents on July 19-27, 1994, and convened the panel on July 28. Additional insights

were gained from the Cooper restart meeting held in NRR on July 29, 1994. The collective assessment is discussed in the sections that follow.

IV. LICENSEE PERFORMANCE

The Cooper performance evaluation panel considered the licensee's performance to be POOR. The overall assessment was determined by integrating the evaluations in the three major Areas of Management Performance, rated POOR; Organizational Performance, rated ADEQUATE; and Equipment Performance, rated POOR.

V. MANAGEMENT PERFORMANCE

The Management Performance Area assessment is developed from two sources. Direct information is obtained from assessments recorded in the document reviews. Indirect information is integrated by examining the collective assessments of the like Categories in five Sub Areas of Organization Performance.

The Management Performance Area was rated POOR. Goals/Objectives, Staffing, Communications, Immediate Supervision, and Planning and Scheduling were rated ADEQUATE. The overall rating for Management Performance was weighted by POOR ratings in Self-Assessment, Corrective Actions, Training, Procedures, and Event Assessment. Although ADEQUATE, licensee performance in Immediate Supervision and Planning and Scheduling was weak.

- Self Assessment - Poor. Overall licensee self-assessment was poor. The licensee's focus was on restart rather than investigating root causes and taking corrective actions to preclude recurrence. Station management authorized restarts without fully understanding problems associated with plant events. Assessments lacked management commitment and resource dedication. It appears that management was averse to bad news.
- Goals/Objectives - Adequate. The licensee established improvement plans and made organizational changes to mitigate the decline in performance. The licensee's approach has improved, but performance has not.
- Corrective Actions - Poor. The overall assessment was heavily weighted by POOR ratings in Operations and Maintenance. The licensee's approach to corrective actions was not systematic and seldom resulted in problem resolution with finality. The licensee demonstrated a willingness to live with problems. Improvement plans have been developed and implemented, but it is not yet evident that the measures are being effective and performance is improving. The panel conducted an overview of licensee improvement plans and noted a unique absence of specific action plans for the operations department. These plans appear to be reactive to NRC findings rather than the result of comprehensive self-questioning by the licensee. The panel recommends the SIF examine this area more closely.
- Staffing - Adequate. Limited information was available regarding the adequacy of staffing. Operating crews were inconsistent in conducting shift turnovers and in documenting operational history. Management expectations were not uniformly implemented. Contradictory information was documented regarding the role of corporate engineering. The movement of a Vice President, QA, Licensing and Audit to the site was viewed as a positive step.

- Training — Poor. Some operators did not receive quarterly fire brigade training and several STAs stood watch with expired qualifications. No training was conducted on operation of the remote shutdown facility. The effectiveness of maintenance training for foreign material controls was poor. Several plant events resulted from the control of foreign materials following maintenance. In contrast, several radiological controls personnel received certification from professional organizations.
- Communication — Adequate. Control room communication via the SS window resulted in improved control room access and decorum. Control room communications and repeat-backs continue to improve. However, communication of management expectations was poor. At times, licensee communication with the NRC was misleading and caused heightened staff concern over performance. Many licensee communications were done informally. Assessment of communications between the site and corporate office was contradictory. Although there was little discussion of breakdowns or barriers to effective communication, it appears that the licensee was not effective in communicating across functional areas.
- Procedures — Poor. Despite positive observations during the service water and 50.59 inspections, the overall quality of procedures and adherence was poor. Operators demonstrated an affinity to work around procedure problems and a lack of vigor in following up on discrepancies. Outdated and inaccurate information was contained in procedures. Uncontrolled vendor manuals were used in performing work. It appears that biannual procedure reviews may be ineffective in maintaining procedures. Procedures were not always updated with design change information in a timely manner. It appears that the design bases were not well documented in procedures and drawings.
- Immediate Supervision — Adequate. Management attention was generally good during routine operations. However, the licensee lacked sensitivity to degraded plant conditions and components. Supervisors failed to question program implementation and did not identify longstanding equipment problems. Field observation programs were not well implemented.
- Event Assessment — Poor. In response to plant events, the licensee's overall focus was on early restart. Some post-trip reviews did not adequately address root causes and plant and equipment performance. The licensee lacked a questioning attitude and applied insufficient rigor to the evaluation and resolution of problems. For one event, the Station Operations Review Committee (SORC) did not fully understand a reactor water level transient before authorizing restart. Active involvement by the Offsite Review Committee was not apparent. Management commitment and resource dedication was lacking for some problem resolution efforts. The licensee was reactive rather than proactive.
- Planning and Scheduling — Adequate. Overall performance was adequate. However, there was a lack of assessment information in the conduct of daily planning meetings such as a Plan-of-the-Day (POD) meeting. No apparent problems were noted in licensee conduct of operations with competing or conflicting work. The OSTI noted that there was no integrated program for staff workload prioritization and coordination. Management information systems were not effectively used and the licensee did not effectively control the backlog of engineering work activities.

VI. ORGANIZATION PERFORMANCE

The Organization Performance Area was rated ADEQUATE. The Radiological Controls Sub-Area was rated GOOD. Engineering was rated ADEQUATE and Control of Quality was ADEQUATE. Operations was rated POOR and Maintenance was rated POOR.

A. OPERATIONS

The panel rated the Operations Sub-Area POOR. Goals/Objectives, Staffing, Communications and Immediate Supervision were rated ADEQUATE. Self-Assessment, Corrective Actions, Training, Procedures and Event Assessment were rated POOR.

- Self-Assessment — Poor. Positive observations were noted in licensee performance during routine operations. Poor performance was observed in licensee self-assessment of plant events. Post-trip reviews lacked rigor and focused on restart rather than root causes. Operators lacked a proper questioning attitude for operability determinations and demonstrated poor self-checking techniques in manipulating controls.
- Goals/Objectives — Adequate. Licensee effort to maintain the main control panels in a "black board" status was considered a strength. Housekeeping improved except in less-traveled areas. Management expectations were poorly defined and objectives for post-trip reviews were not well understood. Operators failed to assume ownership of systems and components.
- Corrective Actions — Poor. The licensee's initial response to problems lacked a systematic approach, evidenced a lack of management commitment and support, and often failed to identify the root causes and preclude recurrence. Noteworthy problem areas include: control room emergency ventilation, deficient alarm response procedures, STA and fire brigade training, and valve position problems associated with clearances. Licensee efforts frequently improved after responding to questions by the NRC.
- Staffing — Adequate. Operating crews were inconsistent in implementing shift turnovers and in documenting operational history. Management expectations were not uniformly implemented. However, operator knowledge of annunciator alarms was good. Personnel assigned to support problem resolution teams (PRTs) were, at times, not dedicated to support the effort. The licensee demonstrated confusion regarding responsibility definition and scheduling for fire watch patrols. Limited assessment information was available with regard to operations staffing levels and response to plant events.
- Training — Poor. Licensee performance was noted to be improved during licensed operator requalification examinations. Personnel were professional. However, some operators did not receive quarterly fire brigade training and several STAs stood watch with expired training qualifications. No training was conducted on operation of the remote shutdown system or on identifying fire barrier deficiencies. Operators had problems in declaring a late UE for a dual-EDG inoperability and in conducting clearances for valve lineups.
- Communications — Adequate. Overall performance was mixed. Control room communication via the SS window resulted in improved control room access and

decorum. Resident inspectors noted continuing improvement in control room communications and repeat-backs. During the service water team inspection, licensee communication was closed loop and effective. Communication of management expectations was poor. Communication for routine operations was adequate, but communication for offnormal plant conditions needs to improve. Licensee communications with the NRC following the March 1994 trip were misleading and led to increased staff concern. Recent licensee communication with the resident inspectors has not been thorough or open.

- Procedures — Poor. Numerous problems have been associated with inadequate procedures and adherence. Operators have demonstrated an affinity to work around procedure problems and a lack of vigor in following up on discrepancies. Repetitive procedure deficiencies were noted in control and testing of the control room envelope, maintenance and surveillance of fire doors, alarm response procedures, and with inaccuracies in valve positions and improper setpoints in procedures. An operator failed to follow procedures which resulted in a loss of shutdown cooling. The licensee's procedure review process was not effective in identifying or correcting deficiencies. The Panel recommends the SET examine the quality of biannual procedure reviews. It appears that validation and verification may be deficient in the review process.
- Immediate Supervision — Adequate. Licensee management attention was generally good during routine operations. There was a lack of sensitivity to potentially degraded plant conditions and components. Long-standing equipment problems were not well addressed. Recent management attention was more evident. However, resident inspectors continue to note deficiencies in control room professionalism and attention to detail during backshifts. Performance in plant housekeeping was mixed. Less-traveled areas were not well maintained.
- Event Assessment — Poor. Positive observations were noted in the licensee's response to the December 1993 loss of feedwater event. However, the post-trip review for the March 1994 scram did not address plant response, equipment performance and the cause of the trip. The licensee did not develop a sequence of events until asked by the NRC. The Station Operations Review Committee (SORC) authorized restart without fully understanding the reactor water level response to the transient. Recent inspections noted the lack of a questioning attitude and attention to detail during surveillance testing.

B. MAINTENANCE

The panel rated the Maintenance Sub-Area POOR. All except Categories were rated POOR except Goals/Objectives and Communication were ADEQUATE, and Staffing which was NOT RATED.

- Self-Assessment — Poor. Licensee assessment of service water booster pump bearing failure demonstrated the capability to resolve technical problems. However, the licensee failed to identify and correct numerous longstanding equipment problems. At times, the licensee failed to evaluate the impact of work on the plant. Maintenance supervision did not effectively implement the field observation program in that only 4 were conducted in 1993. The licensee failed to adequately assess "pre-conditioning" work practices that compensated for system operational deficiencies

- Goals/Objectives — Adequate. Licensee preventative maintenance practices were good. Personnel tasked with resolving MOV problems were not given management expectations. Despite aggressive licensee efforts, the MOV team inspection considered the licensee's program marginally capable of successfully demonstrating capability of MOVs subject to Generic Letter 89-10.
- Corrective Actions — Poor. The licensee's problem resolution process and corrective action system were weak. Although the licensee has taken action to strengthen these areas, significant improvement is not yet evident. The licensee's approach has improved, but overall maintenance has not. The licensee demonstrated a willingness to live with problems and operational work-arounds. The licensee appropriately established a Problem Resolution Team (PRT) to address the large number of MOV problems. The licensee's focus has been on timely restart of the unit rather than on identifying root causes. The dual-EDG inoperability in November 1993 was a good example of this.
- Staffing — Not rated due to insufficient information. We recommend the SET look at the broadness of staffing capability. Do the same individuals do most of the critical work when managers and the NRC are watching?
- Training — Poor. Licensee training for foreign material controls were poor. Foreign material resulted in several operational events/incidents. These included: a HPCI MOV failed to close from foreign material in the starter racks, weld slag caused an RHR MOV to leak by, and an air operated valve failed LLRT due to dust and metal chips on the seating surface. Other problems included an I&C technician rendering both EDGs inoperable by selecting the wrong contacts when establishing the undervoltage setpoint. He did not refer to drawings but relied on experience and discussion. Despite the fact that the procedure lacked instructions, personnel failed to take action to remove a tie-wrap from an undervoltage trip device following maintenance.
- Communication — Adequate. Management expectations were not well understood by maintenance personnel. Weakness was noted in maintenance performing work without proper engineering controls. Maintenance improperly installed a HPCI flow orifice, modified an RHR drain line, and improperly torqued RHR spool pieces without engineering involvement. There was limited assessment with regard to communication across functional areas. The panel recommends the SET evaluate communication with operations and possible breakdowns or barriers to effective communication.
- Procedures — Poor. Positive observations and favorable assessments were made during the service water team inspection. However, procedures for testing the control room envelope, installation of containment isolation penetrations, fire door surveillances, and establishing equipment setpoints were poor. Maintenance procedures and adherence were inadequate. Outdated and inaccurate information was evident in procedures. Uncontrolled vendor manuals were used in performing work. It was not evident that procedures received rigorous or diligent reviews.
- Immediate Supervision — Poor. Procedures allowed for and supervisors approved the use of completed work requests to perform emerging maintenance work. The licensee failed to identify long-standing equipment problems. Managers failed to question program implementation and were reactive rather than proactive in addressing issues.

- Equipment Problems — Poor. Licensee personnel were compensating for deficient equipment performance by "pre-conditioning" equipment before testing. The control room emergency ventilation system was the prime example. Over 50 leaks were identified and the system may not have been operable since initial installation. The design bases for the system were poorly documented. Workers helped the system pass testing rather than assessing system capability to meet safety needs. Licensee foreign material exclusion controls detrimentally affected equipment performance. Maintenance during outages contributed to problems during power operation. Recurring problems continued in fire protection. Good licensee performance was recently noted in repairs of a HPCI stop valve stem.

C. ENGINEERING

The panel rated the Engineering Sub-Area ADEQUATE. Self-Assessment, Goals/Objectives, Corrective Actions, Training, and Immediate Supervision were ADEQUATE. Procedures, Event Assessment, Design and Modification were POOR. The Staffing, Communication, and PRA were NOT RATED. The E&TS team inspection scheduled for June 1994 was started but deferred due to emergent containment integrity issues.

- Self-Assessment — Adequate. The licensee's program for the resolution of problems lacked formality and was not systematic. Weakness was noted in the licensee's program for reviewing operating experience reports. The licensee did not adequately address NRC Bulletins for DB-50 breakers for their application in ESF systems. The licensee failed to take action for GE information on crevice cracking in reactor equipment cooling piping. At times, the licensee does well in assessing challenges. Personnel adequately addressed HPCI suction valve problems. Licensee preparation for the service water team inspection was good.
- Goals/Objectives — Adequate. The staff noted recent improvements and expressed confidence in the newly hired engineering manager. In January 1994, the licensee established an improvement plan. Specific areas addressed included: self-improvement culture, management and supervisory monitoring and support, establishing direction and reinforcing expectations, system and program training and qualification, teamwork, communication and personnel development. The panel could not assess implementation of the Plan.
- Corrective Actions — Adequate. The licensee has difficulty in resolving problems with finality. It appears that the design bases were poorly documented and/or the licensee's understanding was weak. Effort on the control room emergency ventilation system was especially weak in this regard. The licensee tends to focus on the quick fix and early restart. In contrast, the licensee was aggressive in pursuing missing flow orifices in the core spray system and implemented good corrective action for the feedwater flow error.
- Staffing — Not rated due to insufficient information. Contradictory information was documented regarding the role of corporate engineering support. No assessment was apparent with regard to the role of system engineers. The licensee MOV program manager was noted as being the MOV Users Group (MUG) Chairman. The Panel found this somewhat ironic considering the number of MOV problems at the plant.

- Training — Adequate. The licensee training program and implementation for 50.59 safety evaluations was considered good. All 50.59 reviews were performed by qualified personnel. However, the licensee lacked a formal training program in problem identification and analysis.
- Communications — Not rated due to insufficient information. There was no obvious link between operations, maintenance and engineering. There appeared to be a heavy reliance on informal communication in making operability determinations. The communication of expectations to engineers on Problem Resolution Teams (PRTs) appeared weak. NRC assessment of communication with corporate engineering was contradictory.
- Procedures — Poor. The program for preparation and review of 50.59 screenings and safety evaluations was well defined. However, contrary to TS, the Station Operations Review Committee (SORC) was not required by procedure to review modifications on equipment which were not safety-related. Drawings and procedure upgrades were not translated to operations. Changes lacked validation and verification. Procedures contained inaccuracies in setpoints, lacked identification of proper contacts, and had non-conservative calculation errors. Five containment isolation valves were not included in the LLRT program. A recent problem with instrument compensation resulted in the plant operating in excess of it's thermal limits due to a problem with the pressure transmitter for feedwater flow. Several procedure problems were associated with the MOV program.
- Immediate Supervision — Adequate. Management oversight of the 50.59 program was good. Safety evaluations were performed on all design charges, special procedures and temporary shielding requests. Screenings were always performed on equipment specification changes and maintenance work requests.
- Event Assessment — Poor. Problems are not resolved with finality. Deficient design documentation, vendor information and the lack of vigor in resolving problems have negatively influenced the site engineering effort. The licensee has not considered industry operating experience for applicability to their plant. Weakness was noted in licensee root cause analysis. Problem Resolution Team (PRT) performance for a recent RHR shutdown cooling isolation was weak in that interviews were not timely, data was unavailable, and depth of investigation was not vigorous.
- Design — Poor. A lack of available design information and weak understanding of plant design contributed to difficulties in resolving problems. The control room ventilation system may never have been operable. The licensee has problems translating design into drawings and procedures. The licensee's fire protection assessment recommended performing a design bases documentation effort due to the limited record. The service water system was not accurately reflected in design documents. There was a lack of vigor in maintaining the design documentation. The licensee adequately addressed service water valve erosion from an inadequate valve design. The licensee took action to return the valve to service, but it was not evident that the application of the valve was assessed. The solution appeared maintenance-driven.
- PRA — Not rated due to a lack of information.

- Modification — Poor. Assessment in this area was heavily influenced by the OSTI report. The licensee made uncontrolled modifications on insulation. Engineering controls for maintenance work requests were not properly applied. There were a number of discrepancies in small bore piping supports. The licensee did not verify design documents for replacement of an RHK flow orifice. Two 50.59 screenings were identified that did not reflect the plant as described in the SAR. Closed open items and the SALP contradict the observations of the OSTI.

D. CONTROL OF QUALITY

The panel rated the Control of Quality Sub-Area ADEQUATE. Goals/Objectives, Corrective Action, and Staffing were rated ADEQUATE. Self-Assessment was POOR. Training, Communication, Procedures and Immediate Supervision were NOT RATED. There was limited assessment of QA organization and oversight committee involvement in plant activities. If integrated across functional areas, the panel would have rated Corrective Actions, Training and Procedures as being POOR. The panel recommends the SET examine this area.

- Self-Assessment — Poor. Weakness in problem identification and resolution was noted in the SALP and continues to be observed. Management oversight and self-assessments did not identify problems. There was little QA involvement early in plant events. Problem Resolution Teams (PRTs) were sometimes not effective due to a lack of management support, personnel dedication to the task, and poor communication of expectations. Insufficient QA oversight was noted in the MOV program. Following issuance of the SMM trending letter, there were some indications that the performance decline had leveled. QA was more visible, daily oversight improved and management appeared to be responding to the message. However, a QA representative was uniquely absent from the licensee's restart meeting with the NRC in July 1994. It was not evident that the licensee had been thorough enough to bound problems associated with the "pre-conditioning" plant equipment for tests. The licensee did not have a questioning attitude with regard to root causes and potential broadness of the problem. It appears that management continues to be averse to bad news.
- Goals/Objectives — Adequate. The licensee has implemented a number of improvement plans as corrective measures for performance deficiencies. Similarly, the licensee has made organizational changes to strengthen site oversight and support. The panel could not assess the effectiveness of these changes.
- Corrective Actions — Adequate. Licensee management has instituted a number of programs to improve plant performance. These include: Near-Term Integrated Enhancement Program (NTIEP), Integrated Enhancement Program (IEP), Corrective Action Program (CAP), Corrective Action Program Oversight Group (CAPAOG), Corrective Action Program Self-Assistance Group (CAPSAG), Engineering Improvement Plan, Strategic Plan, and Business Plan. The Panel did an overview assessment of these plans and noted that the IEP lacked specific improvement measures for the operations department. The Panel recommends the SET examine the improvement plan more closely. The licensee also conducted a self-assessment of the fire protection program. The fire protection self-assessment made some good observations for improvement and made recommendations to management. However, the Executive Summary was weak in presenting the information. The urgency for

management to take action was not apparent. The panel could not assess improvement plan implementation.

- Staffing — Adequate. Licensee action to assign a Vice President, QA, Licensing and Audit to the site was considered a positive step. Other changes were viewed favorably by the staff.
- Training — Not rated due to a lack of information. The licensee's prior training approach appears to have been compliance-based. The licensee has established measures to institute performance-based assessment per the IEP.
- Communications — Not rated due to a lack of information. The Offsite Review Committee appears to have limited involvement with plant operations and appears to be reactive rather than proactive.
- Procedures — Not rated due to a lack of information. There was limited information on QA procedure quality, adequacy or improvements.
- Immediate Supervision — Not rated due to a lack of information.

E. RADIOLOGICAL CONTROLS

The panel rated the Radiological Controls Sub-Area GOOD. Goals/Objectives, Staffing, Training, and Procedures were rated GOOD. Self-Assessment and Corrective Action were ADEQUATE. Communications and Immediate Supervision were NOT RATED. Assessment in this area was heavily influenced by two routine core inspections. There was no outage inspection in the documents reviewed and resident inspections provided limited insights on radiological controls for work practices.

- Self-Assessment — Adequate. The SALP considered problem identification in radiological controls to be less than aggressive. However, plant performance reviews and specialist inspections since the SALP considered it to be a strong program.
- Goals/Objectives — Good. All assessments considered the program to be strong. Both radiological control core inspections were completed, but there was no outage specialist inspection and limited insights from other routine inspections.
- Corrective Actions — Adequate. There was limited data to assess corrective actions. Assessments were very positive with boilerplate-type results. Only three Radiological Safety Incident Reports (RSIRs) were completed in 1993. This number appears unrealistic and provides uncertainty regarding the licensee's threshold for reporting radiological incidents.
- Staffing — Good. Licensee staffing was considered stable. All assessments were favorable. There was no assessment of contractor use, training and qualification.
- Training — Good. Several licensee technicians achieved personal and professional accomplishments through certification by the National Registry of Radiation Protection Technicians.

- Communication — Not rated due to a lack of information. Internal briefings were good, but there was no assessment of communication with operations and maintenance.
- Procedures — Good. No significant deficiencies were noted in procedural adherence. The Radiological Safety Incident Report (RSIR) program is being merged into the new Condition Report (CR) system.
- Immediate Supervision — Not rated due to a lack of information.

VII. EQUIPMENT PERFORMANCE

The panel rated Equipment Performance POOR. Random Failures was rated ADEQUATE. Design, Reliability and Surveillance were POOR.

- Random Failures — Adequate. Although the plant has a lot of safety system failures, it appears that most are related to poor maintenance, deficient procedures and inadequate problem resolution. Random failures appear to represent a small percentage of the population of equipment problems. Some notable examples were: the trip/feedwater event from a feedwater master controller which experienced age-related degradation, causing partial closure of turbine control valves; plant trip on high neutron flux from erratic bypass valve performance due to a possible failed transistor relay; subsequent bypass valve performance problems due to a failed 24V power supply.
- Design — Poor. The licensee does not appear to have a well documented design bases. This has contributed to problems with resolving recurring problems with the control room emergency filtration system and fire protection deficiencies. Design deficiencies have resulted in unnecessary safety system actuations and improper work practices. The design does not appear to be well established in procedures and plant drawings. The licensee is conducting design basis reconstitution which is addressing some of these issues.
- Reliability — Poor. The licensee has had longstanding problems with equipment reliability. Historically, these were not well addressed. Recent and recurring problems have heightened NRC concern over uncertainty associated with dual-EDG operability, control room emergency ventilation, containment penetration integrity, equipment setpoints and fire protection systems. Licensee efforts have not been effective in achieving final resolution. At times, the licensee has not been fully forthright in providing information. Consequently, the licensee has not instilled confidence that systems will perform their safety functions without compensating effort by personnel.
- Surveillance — Poor. Recent events and equipment problems have revealed significant deficiencies in the licensee's surveillance program. For the control room emergency ventilation system, licensee personnel were compensating for system deficiencies to help it pass the test. The system may not have met the intended safety function under accident conditions. Tie-wraps not removed following maintenance may have rendered both EDGs inoperable. Subsequently, it was realized that the licensee had not been testing the load shedding function for certain 480 V and 4160 V loads. It was also realized that the licensee had not taken action on two NRC Bulletins for DB-50 breakers. When tested, four breakers did not trip on undervoltage due to mechanical binding as described in the Bulletins. During tests for EDG output breaker autoclosure

COMPARISON WITH THE OCTOBER 1993 PERFORMANCE EVALUATION TREE

Cooper

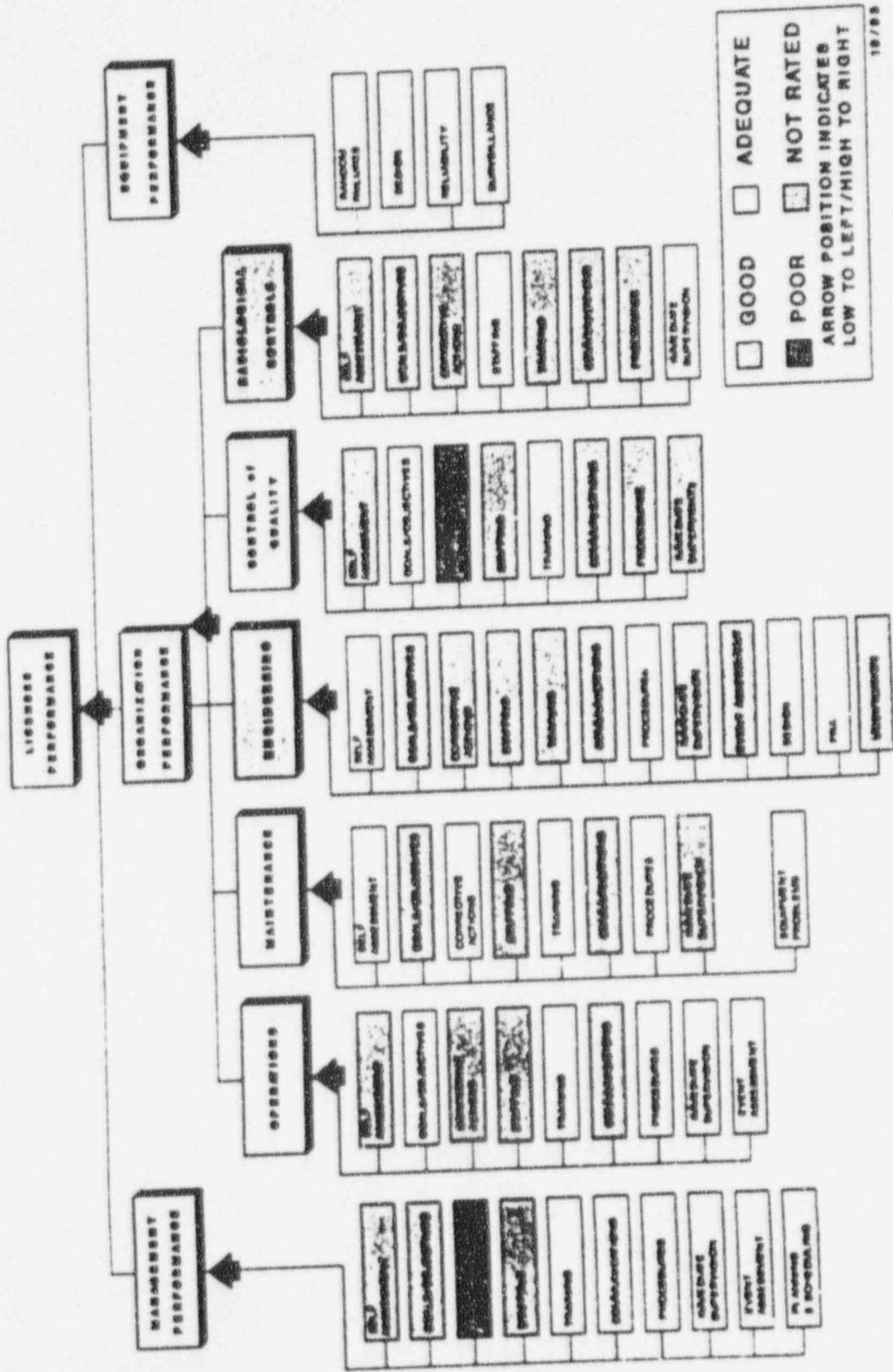
The major contributor to the overall difference between the two assessment trees was the fact that the plant completed a period of sustained continuous operation (2-year run) just prior to the October 1993 evaluation. This was considered very favorably in the assessment. Challenges were not as apparent due to the lack of operational events. We weighted the Operations and Maintenance Categories more heavily in establishing the overall rating for Management Performance. Our results in Self-Assessment, Corrective Actions and Communication reflected this weighted average. Using this approach for the October 1993 assessment, we would have chosen different rating in Management Performance for Self-Assessment, Goals/Objectives, Corrective Actions, and Communication based on the weighted average or bias toward Operations and Maintenance. The Corrective Action result was, however, in agreement with ours largely based on a recent Civil Penalty.

Another significant contributor to the difference was the OSTI inspection. It highlighted significant weaknesses in the licensee's practices. A broad range of problems became evident from plant events and the licensee's response to them. The October 1993 assessment did identify "pre-conditioning" plant equipment to pass surveillance tests, problems with the reactor coolant cooling system, problems with foreign material controls, an earlier loss of shutdown cooling, and an example where the licensee was not completely forthright in providing information to the NRC. However, these indicators were not highlighted as being significant and were not detrimental to the Panel rating in some Sub-Area assessments.

In the October 1993 Assessment Tree, the dominant recurring theme was the 2-year run. In Operations, Maintenance and Engineering, the panel made decisions that indicated favorable performance where "the call" was marginal. When in doubt, the assessment gave the licensee the benefit based on the 2-year run. Individual Sub-Area assessments contradicted our results due, in part, to the difference in information available. After the continuous run, equipment problems and management oversight deficiencies were more apparent. We had more information.

Both assessment Trees were based on written information. If the input information is contradictory, the output information will reflect this difference. Some assessments were very contradictory but were not traceable to the 2-year run. The overall differences in Self-Assessment, Corrective Actions, Training, Procedures, Design, Modification and Equipment Performance creates uncertainty about the validity of some input information. The October 1993 Assessment Tree had favorable characterizations about management oversight, communications, the vendor manual program, design documentation and procedures, trending, operational experience feedback, ISI and modification. Within the scope of this review, it was not possible to resolve the root causes for the broad difference in input information. The panel recommends the SET evaluate why some of the assessment information was so different.

Cooper Performance Evaluation Tree



PRE-DECISIONAL

PERFORMANCE EVALUATION TREE
COOPER

I. INTRODUCTION

The staff developed the performance evaluation tree process as a tool by which to perform an independent assessment of a licensee whose plant has demonstrated a declining or mixed level of performance. The tree consists of 60 Category evaluations within 3 major Areas of performance -- Management, Organization, and Equipment -- the second of which has 5 Sub-Areas. In the evaluation process, the 60 Category assessments are individually performed and then integrated vertically to develop assessments of the Sub-Areas and Areas. Ultimately, upward integration generates the overall licensee performance assessment.

The performance evaluation tree itself is a graphic display of sixty-nine boxes that are arranged, colored, and marked such that the assessment results are easily understood. The most significant box in each Area of performance is at the top. Each box is colored to indicate the result of its assessment: green for GOOD, yellow for ADEQUATE, red for POOR, and blue for NOT RATED because of insufficient information. The nine Area and Sub-Area boxes are marked with black arrows that further distinguish each performance assessment as LOW, average, or HIGH within the overall rating.

Performance is considered GOOD when the licensee has demonstrated the strategy, structure, and execution that provide for safe operation of the plant in the Category under consideration. Performance is considered ADEQUATE when the licensee has demonstrated weaknesses in strategy, structure, or execution, but has still provided for safe operation of the plant. Performance is considered POOR when the licensee has demonstrated the need for improvements in strategy, structure, or execution to continue safe operation of the plant. It should be noted, however, that due to the nature of the material reviewed, the vast majority of judgements contained in the documentation are in the range of neutral to negative.

In the course of developing a tree, the three-person Panel normally reviews about one year's worth of plant-related documents that include inspection reports, licensee event reports, and follow-up information on events, violations, and inspection findings. The Panel assesses and assigns a consensus rating to each Category as a relative measure of the strength or weakness of the licensee's performance in that Category. The Panel's assessments are subjective and based on the cumulative training and experience of each Evaluator. The Panel's tree report, the backup material for the graphic, contains representative data supporting the assessment of each Category.

The Cooper Performance Evaluation Tree (attached) was developed in support of the Senior Management Meeting pre-briefings in November 1993. Two staff members of the Performance and Quality Evaluation Branch (RPEB) and one member of NRR Projects Directorate IV-1 formed the Panel, which convened October 19, 1993. The RPEB evaluator for Regions IV & V plants

was the Panel Chairman. The Panel reviewed documents from about January 1, 1993 to October 19, 1993. Highlights of the evaluations are discussed in the paragraphs that follow.

II. LICENSEE PERFORMANCE

The Cooper Performance Evaluation Panel assessed the licensee's performance as ADEQUATE. Licensee Performance is developed by combining the three major Areas of Management Performance, rated ADEQUATE; Organization Performance, rated HIGH ADEQUATE; and Equipment Performance, rated ADEQUATE.

III. MANAGEMENT PERFORMANCE

The Management Performance Area assessment is developed from two sources. The normal assessments of the Categories are based on information gleaned from the document review. In addition, further insight into the Category assessments may be gained by examining the completed assessments of the like Categories in the five Sub-Areas of Organization Performance, because management has a significant impact on overall station performance.

The Cooper Station's Management Performance Area was rated ADEQUATE. All rated Categories were judged ADEQUATE except the Self-Assessment and Goals/Objectives Categories, which were rated GOOD, and the Corrective Actions Category, which was rated POOR. The Staffing Category was NOT RATED.

- o Self Assessment -- Good. Self-assessment appeared good across the station. The licensee performed an assessment of the SALP functional areas to determine the effectiveness of the corrective actions.
- o Goals/Objectives -- Good. Goals/Objectives appeared good across the station. The 5-year business plan provides goals and objectives for all organizational units, and it is updated quarterly. Plant management was observed in the control room on a daily basis. Housekeeping appeared to be generally good. Management involvement with plant activities was satisfactory. Management oversight of refueling outage was evident.
- o Corrective Actions -- Poor. Corrective actions appeared mixed across the station, with a rating of poor occurring in Control of Quality. Corrective actions for the 1992 SALP concerns appeared well formulated and effective in a variety of areas where implementation was complete. However, the NRC imposed a \$200K civil penalty on the licensee, in part, for failure to identify and correct a potentially significant condition adverse to quality involving startup strainers remaining in safety-related systems. Personnel errors were such that management was prompted to stop outage work for 4 hours in an attempt to correct problems. Appreciable licensee management involvement was required to assure that the plant staff used the corrective action process to evaluate the trip of a breaker in the 345kV switchyard. An inspector found holes in SBGTS duct expansion sleeves; not until an NRC inspector

prompted the comprehensive review weeks later were more such holes found. There are several more examples of poor corrective action for which the licensee was issued violations. For example, shutdown cooling isolation valves were leaking but less than the TS limit; no repair was made, and the valves later failed local leak rate testing. Paint was found blistering inside both condensate storage tanks, but no discrepancy report was written until prompted by NRC inspector.

- o Staffing -- Not rated due to lack of information, although it appeared good in engineering and adequate in radiological controls.
- o Training -- Adequate. Training appeared adequate-to-good across the station. Engineering and technical support training was considered strong and effective.
- o Communications -- Adequate. Management-Operations Supervisor briefings were implemented to enhance communications and convey expectations. However, inaccurate information was conveyed to the NRC concerning temporary strainers.
- o Procedures -- Adequate. Procedures appeared adequate-to-good across the station.
- o Immediate Supervision -- Adequate. Immediate supervision appeared adequate-to-good across the station. A secondary containment leak test was unsatisfactory; pressure was reduced in the radwaste building to pass the test and begin fuel movement rather than identify and install the missing drain line loop seal.
- o Event Assessment -- Adequate. Operations event assessment was adequate. However, the loss of shutdown cooling event review was not performed in a timely manner; short term review had not verified plant response to the event before the plant was restarted.
- o Planning & Scheduling -- Adequate. Management coordination of activities was superior. However, 62 days were added to a planned-52-day outage by emergent work.

IV. ORGANIZATION PERFORMANCE

The Organization Performance Area was rated HIGH ADEQUATE. The Engineering and Radiological Controls Sub-Areas were rated GOOD. The Operations, Maintenance, and Control of Quality Sub-Areas were rated ADEQUATE.

A. OPERATIONS

The Panel rated the Operations Sub-Area ADEQUATE. All rated Categories were judged ADEQUATE except Communications, which was rated GOOD. The Self Assessment, Corrective Actions, and Staffing Categories were NOT RATED.

- o Self-Assessment -- Not rated due to lack of information.

COOPER PERFORMANCE EVALUATION TREE

~~PRE-DECISIONAL~~

- o Goals/Objectives -- Adequate. Proper control room professionalism was maintained. General housekeeping conditions were found to be very good.
- o Corrective Actions -- Not rated due to lack of information.
- o Staffing -- Not rated due to lack of information.
- o Training -- Adequate. Operator actions during reactor shutdown and reactor trip were good. Reactor defueling activities were executed with care. The licensee included an extended emergency preparedness scenario and installed an audio-visual system in the simulator. No generic weaknesses were observed in the simulator; all applicants passed and generally performed well during scenarios. However, job performance measures and related questions provided by the licensee for examination development were not always current. Also, while attempting to rack out a 4160v breaker, an operator could not rack out the incorrect breaker, so he tripped it. (He stated that this action was in accordance with his training.)
- o Communications -- Good. Communications and repeat-backs observed by resident inspectors were good. During refueling, communications between refueling floor and the control room were good. During simulator scenarios, crew communications appeared strong. The licensee implemented management/operations supervisors breakfasts to enhance communications and convey expectations.
- o Procedures -- Adequate. The licensee walked down all EOPs and ACPs, and completed simulator validation of the EOPs. Procedures to implement the fire protection program were technically adequate. However, the procedure used by the operator who tripped and racked out the 4160v breaker did not require self-checking after retrieval of the racking tool, and the procedure used to prepare fuel movement instructions did not address the IS requirement to have all rods inserted (with exception of spiral reload).
- o Immediate Supervision -- Adequate. A shift supervisor proceeded cautiously restoring shutdown cooling during the 36-minute loss of cooling event. The licensee issued a directive on command and control. However, a fire watch in RHR service water booster pump area was unaware of inoperable fire barrier he was supposed to monitor.
- o Event Assessment -- Adequate. Initial response to area flooding (river, summer of 1993) was very good. The decision to shut down based on concerns of states' ability to support the emergency plan and closure of evacuation routes demonstrated appropriate awareness for the unique flooding challenges. Coordination with states on emergency plan readiness prior to restart was very good.

B. MAINTENANCE

The Panel rated the Maintenance Sub-Area ADEQUATE. All rated Categories were judged ADEQUATE. The Goal/Objectives, Staffing, Communications, and Immediate Supervision Categories were NOT RATED.

- o Self-Assessment -- Adequate. The licensee implemented a self-checking program in response to a 1992 SALP concern.
- o Goals/Objectives -- Not rated due to lack of information.
- o Corrective Actions -- Adequate. There was a low backlog of open routine maintenance work requests. Regarding fire protection surveillances, prompt action had been taken to repair defective components, and appropriate compensatory actions were taken when required. However, similar actions were not always taken for non-TS-required components. Also, control room ventilation radiation monitor chart recorder problem resolution was not timely.
- o Staffing -- Not rated due to lack of information.
- o Training -- Adequate. BWR systems training was provided for selected maintenance supervisory personnel. The ISI personnel were well qualified.
- o Communications -- Not rated due to lack of information. In one instance, a fire barrier was not restored prior to dismissal of the fire watch.
- o Procedures -- Adequate. Vendor manuals were well controlled. However, control room ventilation monitor calibration procedure did not address problems caused by high-voltage power supply during detector disconnection/reconnection. Two workers entered drywell rad control area without signing special work permit. The control room HVAC radiation monitor failed a surveillance because the wrong cables had been removed during a modification.
- o Immediate Supervision -- Not rated due to lack of information. However, paint chips and metal shavings were found in a HPCI pump discharge MOV starter (licensee's nomenclature) near the close contactor. The condition was also found near the open contactor and in other HPCI system starters. No cause was found for the LER writeup, even though maintenance, including drilling, had been performed in the area.
- o Equipment Problems -- Adequate. The plant operated for 2 consecutive years without an automatic scram, significant equipment problems, or maintenance-related operational transients. However, during maintenance activity, a cam-operated EDG linkage was knocked out of adjustment, causing fuel to be shut off about 2 hours into a 24-hour surveillance run. Also, a HPCI MOV failed because of failure to implement

revised maintenance procedure calling for locking the pinion gear to the shaft.

C. ENGINEERING

The Panel judged the Engineering Sub-Area GOOD. All rated Categories were judged GOOD except Self-Assessment, Procedures, Design, Probabilistic Risk Assessment, which were judged ADEQUATE. The Event Assessment Category was NOT RATED.

- o Self-Assessment -- Adequate. The weekly audit of temporary mods was considered a strength. There were few such mods.
- o Goals/Objectives -- Good. A 5-year business plan establishes goals and objectives for all engineering divisions. Goals and objectives are reviewed and updated quarterly. Modification packages are to be ready 30 days prior to refueling outages or 90 days prior to commencement of work for mods not requiring an outage. An extensive equipment trending program involves over 2000 trends.
- o Corrective Actions -- Good. NCRs reviewed by NRC showed extensive effort and conservative judgement, with detailed and well conceived root cause analysis. Modifications to address local leak rate test failures of feedwater check valves were timely and thorough.
- o Staffing -- Good. There was a very stable engineering staff with a low turnover rate. Staffing levels were consistent with the workload. Morale was high. All 70 systems were assigned to systems engineers.
- o Training -- Good. Training appeared effective and included root cause analysis, 50.59 reviews, BWR systems, and industry codes and standards. System engineers were STA qualified.
- o Communications -- Good. The interface between corporate and site engineering groups was effective. There were frequent site visits by corporate engineering personnel. Engineering had high credibility with other licensee organizational units.
- o Procedures -- Adequate. The reactor level setpoint methodology revision to account for temperature effects was promptly proceduralized. The design basis documentation program was of good quality. However, several procedures were found to be inadequate. Containment hydrogen analyzers sample piping and cabinet internals were not tested as required by TS, and valve lineup to test piping to that analyzer was not specified in procedure. Monthly functional test of the analyzers did not verify the operability of heat tracing. No instructions were provided to specify how or when to return elevated release point rad monitor back to service following a loss of offsite power.

COOPER PERFORMANCE EVALUATION TREE

- o Immediate Supervision -- Good. Although the Panel found no direct reference to the performance of the supervisors, the excellent results detailed throughout this section direct this judgement.
- o Event Assessment -- Not rated due to lack of information. However, the operability determination for the RCIC system following discovery of temporary strainers in suction piping was weak.
- o Design -- Adequate. Conservative engineering practices were observed for modifications. However, the 50.59 evaluation for the drywell ventilation radiation monitor missed an unreviewed safety question.
- o PRA -- Adequate. PRA was used in engineering reviews of plant modifications. The PRA group was established in the engineering department. IPE Level I and II show no significant vulnerabilities.
- o Modification -- Good. Configuration management was found to be effective. The Nuclear Configuration Management Department was effective and consisted of a configuration management group, a PRA and engineering review group, and a design basis group. Additionally, drawings were updated in a timely manner following modifications, vendor manuals were well controlled. Weekly audits of temporary modifications were performed. Design basis documentation program identified improper HPCI flow instrumentation calibration that had existed since 1974. However, failure to include the essential portions of service water and reactor equipment cooling systems in Section XI ISI program resulted in reliance on systems to perform with temporary repairs, no hydro tests since original construction, and no hydro. performed on piping after maintenance.

D. CONTROL OF QUALITY

The Control of Quality Sub-Area was rated ADEQUATE. The Self-Assessment Category was rated GOOD. The Goals/Objectives and Training Categories were rated ADEQUATE. The Corrective Actions Category was rated POOR. The other four Categories were NOT RATED.

- o Self-Assessment -- Good. The station operations review committee (SORC) meetings were conducted in a professional manner, presentations were brief but thorough, and members appeared thoroughly prepared. There was good dialogue between committee members and presenters. Probing questions were asked, and meaningful information was exchanged. There was strong concern for safety among all participants. The nonconformance overview committee (NOC) reviews for closure were thorough, comprehensive, and well documented. The NOC assured consistency in NCR reviews and root cause analysis because of the thorough close-out reviews. Also, QA audits of fire protection appeared to be thorough. Although the QA

quarterly trend reports were thorough and comprehensive, they neither highlighted potential problems nor provided assessment or recommendations as a result of indicated trends. Additionally, the monthly station performance indicators received limited distribution and included no assessments or conclusions.

- o Goals/Objectives -- Adequate. The operational experience feedback program appeared to be effective, with a particularly strong feedback tool in place for the training program. However, there was no formal program for human performance investigation, although the possibility of future implementation of such a program was being considered.
- o Corrective Actions -- Poor. As a result of a SALP comment regarding a high threshold for NCRs, a lower threshold program called deficiency reports was developed and appeared well established and accepted. However, the corrective actions were untimely regarding, for example, the temporary strainer issue, the inoperable hydrogen/oxygen monitor, and the high level of diesel fuel particulates. There was a lack of questioning attitude concerning the Missouri-flood-related water incursion.
- o Staffing -- Not rated due to lack of information.
- o Training -- Adequate. The document and event review committee (DERC) performed reviews of a variety of subjects -- including industry operational experience reports, NCRs, vendor notices, significant event reports, audit results, and procedure changes -- and, along with concurrent evaluations and development of potential training improvement recommendations, provided a particularly strong feedback tool for the training program. QA surveillances on radioactive materials and waste shipments are performed by RP technicians assigned to the QA department and trained as QA inspectors. However, individuals interviewed stated they had had training on the deficiency reporting (DR) process, but most said the training was not comprehensive: most could not define what constituted a degraded or nonconforming condition; most could not tell when a DR should be written. As noted in Corrective Actions, above, there was a lack of questioning attitude concerning the Missouri-flood-related water incursion.
- o Communications -- Not rated due to lack of information.
- o Procedures -- Not rated due to lack of information.
- o Immediate Supervision -- Not rated due to lack of information.

E. RADIOLOGICAL CONTROLS

The Panel judged the Radiological Controls Sub-Area GOOD. All rated Categories were judged GOOD except the Staffing and Immediate

COOPER PERFORMANCE EVALUATION TREE

~~PRE-DECISIONAL~~

Supervision Categories, which were rated ADEQUATE. The Corrective Actions and Communications Categories were NOT RATED.

- o Self-Assessment -- Good. Rad Con self-assessment was conducted in response to weaknesses identified in the 1992 SALP. Excellent audits and surveillances were performed by qualified personnel. QA surveillances on radioactive materials and waste shipments were performed by an RP technician assigned to the QA department and trained as a QA inspector.
- o Goals/Objectives -- Good. Total person-rem was below established ALARA goals. ALARA personnel made frequent tours of drywell to observe work in progress. Solid radwaste management program was well implemented. The chemistry index was maintained below the 1995 industry goal throughout the last cycle.
- o Corrective Actions -- Not rated due to lack of information.
- o Staffing -- Adequate. The ALARA and HP staffing was augmented to match peak outage workload. The permanent staff was sufficiently supplemented with contract RP technicians.
- o Training -- Good. The initial and requalification training programs for radwaste operators, maintenance personnel, and health physics personnel were excellent and accredited. Operations, maintenance, and health physics departments had well qualified staffs to process and ship radioactive materials and waste. Operations and health physics training instructors were well qualified. All supervisors and professional staff members had received continuing training in their specialty. Contract RP technicians met qualification requirements; those interviewed said training compared favorably with that they had received at other facilities. The licensee implemented enhanced guidance on hot spot posting. However, in one instance noted, control of contractor employees in rad area of the drywell was not effective.
- o Communications -- Not rated due to lack of information. Pre-job briefings were conducted very well, but there was no positive mechanism to ensure that all targeted workers received the briefing.
- o Procedures -- Good. Excellent radwaste management procedures were implemented. Very good ALARA procedures were implemented by radwaste personnel. Special work permits (SWPs) provided excellent guidance to workers and were easy to understand. Rad work areas were properly posted and controlled; postings and surveys provided excellent information regarding radiation levels. However, in one noted instance, two contract maintenance workers entered a special work permit area without reading the SWP instruction.

- o Immediate Supervision -- Adequate. Rad protection technicians provided good coverage and control. Housekeeping in the rad control areas ranged from good to fair. There were isolated examples of workers not recharging their self-reading dosimeters before entry into an SWP area.

V. EQUIPMENT PERFORMANCE

The Panel rated the Equipment Performance Area ADEQUATE. All Categories were judged ADEQUATE.

- o Random Failures -- Adequate. There were few reported random failures. A faulty underfrequency unit caused the RPS MG set to trip, deenergizing the RPS bus. HPCI was declared inoperable when a pump discharge valve would not re-open upon demand after a surveillance. A source range monitor detector would not drive full-in to the core because screws holding the drive cable to the motor gear box shaft had worked loose.
- o Design -- Adequate. IPE Levels I and II identified no significant vulnerabilities. However, the design basis reconstitution (DBRC) program identified a single failure issue in the standby gas treatment system. (The issue was promptly resolved.) The DBRC effort found that the HPCI design flow would not have been attained under transient or accident conditions because a flow transmitter specification was not changed when an related orifice specification was changed. Two Limitorque valves had potential for de-clutch mechanism resonance failure, and an RHR heat exchange service water outlet valve had through-wall erosion, both from inadequate vendor design.
- o Reliability -- Adequate. The plant operated for 2 consecutive years without an automatic scram or significant equipment problems. However, the control room ventilation radiation monitor experienced repeated failures. A reactor building ventilation exhaust valve that normally closed in 4 seconds took 15 minutes to close because supply air system solenoid valves were binding. Of 30 MOVs inspected for environmental qualification (EQ) of terminal lugs, about half were found to need repair prior to acceptance.
- o Surveillance -- Adequate. The ISI program is effectively implemented. However, the secondary containment integrity test failed to verify a lack of interaction between secondary containment and other HVAC systems.

COOPER

I. HISTORY

Cooper Nuclear Station was first discussed at the June 1993 Senior Management Meeting (SMM). The basis for concern was apparent declining performance. Although licensee personnel displayed individual pride in the plant and seemed to operate the plant well during routine operational periods, they failed to aggressively pursue and evaluate issues that were identified during periods of high activity, such as non-routine operational and outage periods. Performance during the 1993 refueling outage showed significant weaknesses in the ability to identify and resolve technical and safety issues.

Senior licensee management had a leadership style that resulted in middle management being reluctant to make decisions. The management team was reactive and not proactive. The licensee's organization has been resource limited, and with the increasing number of issues being identified, the organization's ability to adequately resolve the concerns and issues has been weak.

As discussed at the SMM in January 1994, senior management has moved to the site to provide management direction for site activities. Management and key personnel have become increasingly stressed as the work load and number of plant issues identified continued to increase. Due to continuing decline in overall performance Cooper was issued a trending letter in January 1994.

The senior managers were developing an aggressive Near Term Integrated Enhancement Program to ensure that continued improvements in plant performance are realized.

II. CHANGES SINCE LAST SMM

Since issuance of the trending letter, the decline in the licensee's performance has stopped and appears to have stabilized. Additional issues have been identified but for the most part, the licensee's identification and approach to correct these problems has shown improvement. The dominant concern has been a lack of management's ability to get a commitment from plant employees at all levels to improve their performance. The most recent performance data indicates that improvements at the site appear to have reached the first line of supervision; however, many of the workers still do not have a clear understanding of management's expectations. This lack of understanding appears to be limited to only a few functional areas.

Significant inspection findings since the last SMM include:

- The licensee's failure to rigorously investigate and determine the root cause of a reactor scram on March 3 that resulted in the actuation of the high pressure coolant injection system. Licensee personnel did not discover the cause of the event until they were in the process of starting up the reactor and received uncontrolled fluctuations of the turbine bypass valves.
- The licensee had to shutdown the plant to repair a leaking RHR isolation valve that had been caused by foreign material (weld slag) on the seating surface. Also during this shutdown, a containment isolation vent valve

C 11

had to be repaired due to foreign material. In both cases foreign material was introduced during the previous outage.

- On April 11, 1994, the licensee was unable to meet the design requirements for the control room pressure envelope and over 50 leaks were identified by the licensee. The control room envelop, in all likelihood, has never been capable of performing its design function under all design conditions.

These activities indicated that the licensee is beginning to become more diligent in their efforts to identify and correct problems and/or concerns, but the depth of their efforts and their thoroughness in resolving the issues continues to be a concern. Mid-level managers and first-line supervisors addressing these concerns have generally not received prior training on the tasks they are assigned to perform.

To address the issues discussed above and the other issues previously identified during past inspection activities, the licensee completed the formulation of a Near-Term Integrated Enhancement Program (IEP), which identifies the causes for the declining performance at Cooper and outlines the proposed actions that the licensee plans to implement to resolve these issues. The licensee identified the three most significant challenges as: (1) changing the culture in the maintenance department, (2) obtaining employee ownership of the required improvements, and (3) developing rigor and consistency in the handling of reactive issues. The licensee's IEP has been effective in identifying personnel performance errors, and the licensee's periodic trend reports have been effectively used by management for monitoring the IEP status.

Management changes continue to be discussed by licensee management, but the implementation of these changes are not evident. Only staff additions to engineering, chemistry, and health physics have been implemented.

The most recent SALP was performed in July 1993. Because of the numerous equipment problems and the failure of the licensee to self-identify and correct the problems, the areas of Maintenance/Surveillance and Safety Assessment/Quality Verification were assigned ratings of Category 3. Engineering/Technical Support was rated as Category 2 with significant weaknesses in problem resolution by the site engineering group. Operations was rated as Category 2 based on a lack of a questioning attitude on the part of the operating staff for some engineering operability determinations. Recurring problems in Emergency Preparedness were noted and this area was assigned a Category 2 with a declining trend. Radiological Controls was assigned a Category 2 rating with an improving trend, and Security was assigned a Category 1 rating.

An evaluation of the licensee's performance indicates that the area of Maintenance/Surveillance has not improved. Problems continue to occur throughout this area. The licensee's approach to correcting identified problems has improved so as to mitigate or reduce potential reoccurrences. Maintenance backlog has remained steady and appears manageable at this time.

Plant engineering has exhibited improvement. The new Engineering Manager is taking a very active role in almost every issue that has surfaced in recent months. There appears to be a willingness by the engineers to perform well and

the Engineering Manager is presently assembling a set of standards and guidelines so as to assess the engineers' depth of knowledge and capabilities.

Housekeeping is improving in most areas of the plant. With the reduction in radiologically contaminated areas, plant personnel are able to better maintain equipment and areas. There continue to be areas of concern with respect to the material condition of plant equipment (diesel generators, feedpumps, CRD pumps, hydrogen seal oil).

There has been a visible improvement in the presence of quality assurance (QA) and self-assessment personnel throughout the plant. The Division Manager and several other managers have been moved to the site, and QA has taken an active role in day-to-day plant activities. The findings identified by QA audits are receiving better plant management attention for resolution, but improvement in addressing the findings is needed.

Plant Operator performance is mixed. There is indication that the shift operators have taken responsibility and are exercising firmer control of shift activities and decisions. A recent inspection identified weaknesses in several operational crews pertaining to their understanding of emergency preparedness requirements, with significant weaknesses identified in one particular crew. Control room operator response to the recent reactor scrams and the loss of shutdown cooling appeared to be effective, but a noticeable lack of mid-level management involvement continues to exist.

III. FUTURE ACTIVITY

An Engineering and Technical Support Inspection is scheduled for June 1994.

An end-of-SALP-cycle inspection will be performed in August 1994.

An Operational Safeguards Response Evaluation (OSRE) is scheduled for 1995.

The licensee is planning to extend the current cycle to have the next refueling outage in February 1995.

The licensee plans to implement its Nuclear Business Plan in mid 1994. This document will then take the place of the Near Term IEP.

DATA SUMMARY

I. OPERATIONAL PERFORMANCEA. Scram Summary

There has been 1 reactor scram from power during this period. On March 2, 1994, a partial closure of the turbine governor valves caused a pressure increase and the reactor scrambled on high flux.

B. Significant Operator Errors

None

C. Procedures

During the past few months, several plant events and problems have been caused by the failure to follow procedures and inadequate procedures. For example, the calibration procedures for emergency diesel generator relays were inadequate, and as a result, an electrician incorrectly set relays associated with both diesels, which rendered them inoperable.

II. CONTROL ROOM STAFFINGA. Number of Licensed Operators

	<u>SRO</u>	<u>RO</u>	<u>TOTAL</u>
Licensed Operators	33	14	47

B. Number and Length of Shifts

6 shifts, 12-hour shifts

C. Role of STA

The STAs at Cooper Nuclear Station are on duty for a 24-hour rotational period. They are not assigned to a specific shift crew; however, they do receive training with a specific shift crew. STAs do not hold a senior reactor operator's license. The STA's primary duty is to act as an accident prevention and mitigation advisor to the shift supervisor.

D. Requalification Program Evaluation

A requalification program evaluation conducted in December 1993 resulted in a satisfactory rating for the program. Region IV will conduct an inspection in accordance with IP-71001, "Licensed Operator Requalification Program Evaluation," during the month of November 1995.

III. PLANT-SPECIFIC AND UNIQUE DESIGN INFORMATION

A. Plant-Specific Information

Plant	Cooper Nuclear Station
Owner	Nebraska Public Power District
Reactor Supplier/Type	GE/BWR
Capacity, MWe	778
AE/Constructor	Burns & Roe
Commercial Operation Date	July 1, 1974

B. Unique Design Information

Containment: Mark I, with a hard vent

Emergency Core Cooling Systems: Two loops of low-pressure core spray, two loops of low-pressure coolant injection, one high-pressure coolant injection system, one reactor core isolation cooling system, and an automatic depressurization system.

AC Power: Five 345 Kv lines, one 161 Kv line and one 69 Kv line; two turbocharged, V-16, Cooper-Bessemer diesel generators.

DC Power: Four Class 1E batteries with 8-hour capacity (and four battery chargers), two 125-volt and two 250-volt.

IV. SIGNIFICANT MPAs OR PLANT-UNIQUE ISSUES

MPA B-105, Generic Letter 87-02, Seismic Qualification of Mechanical and Electrical Equipment in Operating Plants. Licensee seismic analysis scheduled to be submitted 05/22/95.

MPA B-111, Generic Letter 88-20, Individual Plant Examination for Severe Accident Vulnerabilities. Staff review of licensee response to GL 88-20 is in progress.

MPA B-118, Generic Letter 88-20, Supplement 4, Individual Plant Examination of External Events. Licensee IPEEE evaluation scheduled to be submitted 06/28/94.

V. STATUS OF THE PHYSICAL PLANT

GROUND WATER PROBLEM: During the period when the Missouri River level was high in July, a considerable amount of ground water intruded into the reactor and turbine buildings. This was likely to be caused by degradation of building seals.

RADIATION MONITORS: The radiation monitors (manufactured by Kaman) used for monitoring the radiation levels in the reactor building and for monitoring the gaseous releases from the elevated release point, the turbine building, and the radwaste building have experienced repeated failures.

VI. PRA

A. PRA Insights

Cooper is a BWR 4 with a Mark I containment. BWR PRAs indicate that station blackout is a major contributor to core damage frequency. Offsite power for Cooper is supplied from a 161KV line and several 345KV lines that feed into the start-up transformer, and a 69KV line that feeds into an emergency transformer. The 69KV power source supplies emergency loads only. The 69KV offsite power source has a poor record of spurious failures due to lightning strikes. After an SSFI revealed voltage problems on the 69 KV line, a new substation was added to help control the power. Since December 1992, the 69KV power source has been reliable.

The Emergency Diesel Generators (EDGs) require control air to maintain a set engine speed and provide protective trip functions. If control air is lost, the EDGs will shut down. Cracking of instrument air tubes has occurred due to vibration resulting in diesel engine trips. Relocation of engine mounted instruments has apparently rectified the situation in that for approximately the past two years there have been no diesel engine trips because of that situation. In the event of a station blackout, the 250V and 125V DC batteries have the capacity to accommodate the loads for a duration of 8 hours without load shedding.

Published PRAs provide a strong indication that service water systems are risk significant. In the past year, Cooper has experienced microbiologically induced corrosion in certain sections of piping associated with the SWS (radiation monitor sample line) as a result of stagnant or low flow conditions. The entire SWS was reviewed to identify sections of piping subject to these same conditions. All identified sections of piping were inspected and no similar conditions were found. At Cooper, the SWS was not originally designed as an ASME Code Class 3 system. Although the SWS is included in the IST program, it has not been included in the ISI program in accordance with the provisions of 10 CFR 50.55a(g). Therefore, SPSB has suggested to RES that the treatment of the SWS failure rates should be evaluated carefully during the IPE review process. The licensee plans to include the SWS in the ISI program starting with the next refueling outage in 1995.

B. PRA Profile

In response to Generic Letter 88-20, the licensee submitted an IPE for Cooper on March 31, 1993. The IPE was performed by a team made up of licensee staff and SAIC personnel. In the IPE submittal, which contains a Level 1 PRA and a Level 2 PRA, the estimated mean core damage frequency is $7.97E-5$ per year. The RES review of the IPE is in progress but as of April, 1994 a completion date has not been set. The IPE submittal does not provide a summary of the risk profile in terms of initiating events and sequence contributions to core damage frequency. It does provide a risk profile in terms of accident type, which is presented below.

<u>Accident Type</u>	<u>% of CDF</u>
Station Blackout	34.8%
Transient Induced LOCAs	30.3%
Loss of Coolant Injection	18.1%
Loss of Containment Heat Removal	10.9%
ATWS	4.9%
LOCAs	0.9%
Fast Containment Failures	0.1%

Because the IPE was summarized in terms of accident type, a coarse review of the IPE by SPSB was performed to try to categorize the risk profile in terms of initiators and sequence contributors to core damage frequency for comparison purposes. On the basis of this review, it appears that the Loss of Containment Heat Removal category refers to sequences initiated by Loss of Service Water. The Loss of Coolant Injection category appears to include sequences involving any type of transient with no injection systems of the required pressure available.

The most dominant contributors to accident sequences that lead to core damage were found to be failure of the EDGs to continue to run, mechanical failures of the HPCI and RCIC systems and RCIC turbine, common cause failure (CCF) of all four SW pumps, CCF of the EDGs, failure of the operators to use the SRVs, and CCF of the SRVs.

The IPEEE is scheduled for submission on June 28, 1994.

C. Core Damage Precursor Events

On the basis of the precursors identified by ORNL for 1991 and 1992 (NUREG/CR-4674, vols. 15 thru 18), SPSB did not identify any precursor events for the unit that have a conditional core damage probability of $1E-5$ per year or greater.

The following event has been classified as a "Significant Event" for the performance indicator program. From May, 1992, until March, 1993, Cooper continued to operate with RCS leakage, at a rate of approximately 0.4 gpm, through both isolation valves of the shutdown cooling suction line. This rate was sufficient to require the operators to establish a relief path from the suction line to the ECCS keep-filled system. During the March, 1993 refueling outage, the licensee disassembled and inspected both valves (for the first time) and found cracks in the seats and discs. SPSB reviewed this event for its implications with respect to interfacing system LOCA. It is not possible to calculate a conditional core damage probability for this event since there is no means available to determine the probability of failure for the suction isolation valves during the period of interest at Cooper, given the degree of leakage observed and cracks found. If Cooper had experienced gross failure of the RHR suction line isolation valves, the event would have been highly risk significant. Therefore, the physical condition of the plant may or may not have created a significant level of risk. However, the

actions of the licensee indicated a lack of appreciation for the risk associated with an Interfacing Systems LOCA.

The following event was classified as an "Event of Interest" for the Performance Indicator Program. On 11/8/93, during a test of both EDG output breaker autoclose permissive relays, the contacts failed to close at the required setpoint. Investigation determined the cause to be due to miscalibration five months earlier. It was later determined that the EDGs would not have been affected by the relay miscalibrations during a loss of offsite power event that required them to start and immediately tie onto the safety buses. However, the output breakers would not have automatically closed if offsite power were initially available and then subsequently lost after the EDGs were running in standby mode. The output breakers for the EDGs could have been manually closed by the operators in the control room. An initial ASP evaluation of the event modelled both EDGs failed for a five month period with operator recovery credit and calculated a conditional core damage probability (CCDP) of $5.3E-5$. This CCDP is conservative since the EDGs would only have failed under the scenario described above.

VII. ENFORCEMENT HISTORY (Since June 1992)

- 3/93 CIVIL PENALTIES - The action was based on two Severity Level III violations associated with: (1) providing inaccurate information to the NRC in response to a Notice of Violation, and (2) the failure to identify and correct a potentially significant condition adverse to quality, after the 1992 discovery of a strainer that had been left in a safety system since initial start-up. Civil penalties were issued to emphasize the licensee's need to improve its problem identification and resolution programs. (\$200,000)
- 10/93 CIVIL PENALTIES - The action was based on three Severity Level III violations associated with: (1) several violations of 10 CFR 50 which collectively indicate a breakdown in the licensee's corrective action program; (2) the failure to maintain the containment hydrogen/oxygen analyzers in an operable condition; and (3) the failure to include the service water and reactor equipment cooling systems in the inservice inspection program since initial plant operations. Civil penalties were issued to emphasize the significance that the NRC attaches to these violations and the importance that the NRC attaches to NPPD's efforts to resolve deeply rooted and fundamental weaknesses in employee attitudes toward identifying and resolving problems. The civil penalties were \$75,000, \$75,000 and \$50,000 respectively.

- 3/94 ENFORCEMENT CONFERENCE - Two Severity Level IV violations were issued for inadequate procedures and weaknesses in the licensee's corrective program.
- PENDING (EA 94-018) - Based on possible breakdown in the control of licensed activities, including procedural inadequacies and technical specification noncompliances, failures in configuration and design control, and two failures to control temporary modifications.