



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

January 9, 2002

David L. Wilson, Vice President of
Nuclear Energy
Nebraska Public Power District
P.O. Box 98
Brownville, Nebraska 68321

**SUBJECT: COOPER NUCLEAR STATION - NRC SUPPLEMENTAL INSPECTION
REPORT NO. 50-298/01-11**

Dear Mr. Wilson:

On December 11, 2001, the NRC completed a supplemental inspection at your Cooper Nuclear Station. The enclosed report documents the inspection findings which were discussed with you and other members of your staff.

The NRC determined that a degraded emergency preparedness cornerstone existed at Cooper Nuclear Station based on two White inspection findings that were documented in Inspection Reports 50-298/2000-16 and 50-298/2001-04. These findings were: (1) The formal critique process in the 2000 biennial emergency preparedness exercise failed to identify performance problems related to a risk-significant emergency planning standard (Inspection Report 50-298/2000-16); and (2) Corrective actions implemented to prevent recurrence of a dose assessment performance weakness identified during the August 29, 2000, biennial exercise were not fully effective in that they were narrowly focused and failed to prevent recurrence of the performance weakness (Inspection Report 50-298/2001-04).

The risk-significant performance weakness associated with both findings involved a failure of the emergency response organization in both an emergency exercise and emergency drill to recognize a degraded core condition, which resulted in the issuance of inaccurate protective action recommendations for offsite populations.

This supplemental inspection was conducted to provide assurance that the root and contributing causes of the two White inspection findings are understood to independently assess the extent of the condition, to provide assurance that the corrective actions to risk significant performance issues are sufficient to address the root causes and contributing causes, and to prevent recurrence of the problems. Detailed observations, assessments, and conclusions of the inspection are presented in the enclosed inspection report.

The root causes of the findings were ultimately understood, and the corrective actions resulting from the evaluations of the findings appropriately addressed the identified causes. However, some weaknesses were noted in the root cause evaluation of the performance issue associated

with inspection finding (2) above. Details of these weaknesses are discussed in the enclosed inspection report. The weaknesses did not invalidate the root cause evaluations because the corrective actions implemented as a result of these evaluations were appropriate for all causes identified by both your staff and the NRC.

However, the NRC has concluded that additional inspection effort is required to adequately assess the extent of the condition of the various causes identified in the licensee's evaluations. This conclusion is based on concerns that are discussed in the enclosed report.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Arthur T. Howell III, Director
Division of Reactor Safety

Docket: 50-298
License: DPR-46

Enclosure:
NRC Inspection Report No.
50-298/01-11

cc w/enclosure:
G. R. Horn, Senior Vice President
of Energy Supply
Nebraska Public Power District
1414 15th Street
Columbus, Nebraska 68601

John R. McPhail, General Counsel
Nebraska Public Power District
P.O. Box 499
Columbus, Nebraska 68602-0499

D. F. Kunsemiller, Risk and
Regulatory Affairs Manager
Nebraska Public Power District
P.O. Box 98
Brownville, Nebraska 68321

Nebraska Public Power District

-3-

Dr. William D. Leech
Manager - Nuclear
MidAmerican Energy
907 Walnut Street
P.O. Box 657
Des Moines, Iowa 50303-0657

Ron Stoddard
Lincoln Electric System
1040 O Street
P.O. Box 80869
Lincoln, Nebraska 68501-0869

Michael J. Linder, Director
Nebraska Department of Environmental
Quality
P.O. Box 98922
Lincoln, Nebraska 68509-8922

Chairman
Nemaha County Board of Commissioners
Nemaha County Courthouse
1824 N Street
Auburn, Nebraska 68305

Sue Semerena, Section Administrator
Nebraska Health and Human Services System
Division of Public Health Assurance
Consumer Services Section
301 Centennial Mall, South
P.O. Box 95007
Lincoln, Nebraska 68509-5007

Ronald A. Kucera, Deputy Director
for Public Policy
Department of Natural Resources
205 Jefferson Street
Jefferson City, Missouri 65101

Jerry Uhlmann, Director
State Emergency Management Agency
P.O. Box 116
Jefferson City, Missouri 65101

Nebraska Public Power District

-4-

Vick L. Cooper, Chief
Radiation Control Program, RCP
Kansas Department of Health
and Environment
Bureau of Air and Radiation
Forbes Field Building 283
Topeka, Kansas 66620

Training, Exercises, & Evaluation
Branch Chief
FEMA Region VII
2323 Grand Blvd., Suite 900
Kansas City, Missouri 64108-2670

Electronic distribution from ADAMS by RIV:

- Regional Administrator (**EWM**)
- DRP Director (**KEB**)
- DRS Director (**ATH**)
- Branch Chief, DRS/PSB (**GMG**)
- Inspector, DRS/PSB (**WAM**)
- Inspector, DRS/OB (**GEW**)
- Senior Resident Inspector (**JAC**)
- Branch Chief, DRP/C (**KMK**)
- Senior Project Engineer, DRP/C (**vacant**)
- Staff Chief, DRP/TSS (**PHH**)
- RITS Coordinator (**NBH**)
- Jim Isom, Pilot Plant Program (**JAI**)
- RidsNrrDipmLipb**

Only inspection reports to the following:

- Scott Morris (**SAM1**)
- CNS Site Secretary (**SLN**)

DOCUMENT NAME: R:_CNS\2001\CN2001-11RP-WAM.WPD

RIV:DRS/PSB	OB	C:PB	C:DRS/PSB	D:DRS
WAMaier:nlh	GEWerner	KMKennedy	GMGood	ATHowell III
/RA/	/RA/	/RA/	/RA/	/RA/
12/11/01	12/14/01	12/31/01	12/28/01	01/09/02

OFFICIAL RECORD COPY

T=Telephone

E=E-mail

F=Fax

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No: 50-298
License No: DPR-46
Report No: 50-298/2001-11
Licensee: Nebraska Public Power District
Facility: Cooper Nuclear Station
Location: P. O. Box 98
Brownville, Nebraska
Dates: November 12 through December 11, 2001
Inspectors: W. Maier, Regional State Liaison Officer
G. Werner, Operations Engineer
Approved by: Gail M. Good, Chief
Plant Support Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

Cooper Nuclear Station NRC Inspection Report 50-298/2001-11

IR 05000298-01-11, on 11/12 through 12/11/2001, Nebraska Public Power District, Cooper Nuclear Station. Supplemental inspection for a degraded emergency preparedness cornerstone in the reactor safety strategic performance area resulting from two White inspection findings.

Cornerstone: Emergency Preparedness

This supplemental inspection was performed by the NRC to assess the licensee's evaluations of the following inspection findings: (1) The formal critique process in the 2000 biennial emergency preparedness exercise failed to identify performance problems related to a risk-significant emergency planning standard involving dose assessment (NRC Inspection Report 50-298/2000-16); and (2) Corrective actions implemented to prevent recurrence of a dose assessment performance weakness identified during the August 29, 2000, biennial exercise were not fully effective in that they were narrowly focused and failed to prevent recurrence of the performance weakness (Inspection Report 50-298/2001-04). These performance issues were characterized as having low to moderate risk significance ("White").

During this supplemental inspection, the inspectors evaluated the extent of condition for finding (1) above and found that other problems with a similar root cause did not exist significantly beyond the original case. The licensee's evaluations of finding (2) contained a very limited historical review of Cooper Nuclear Station's experience with the issue and some unsupported assumptions that affected the ability to perform a completely objective evaluation. These weaknesses did not invalidate the root cause evaluations because the corrective actions implemented as a result of these evaluations were appropriate for all causes identified by both the licensee and the NRC.

The inspectors concluded that additional inspection effort was required to adequately assess the extent of condition reviews of the various causes identified in the licensee's evaluations. This conclusion was based on the following:

- Problems were noted with one emergency operations facility (EOF) team's determination of degraded core status. This indicated that a more thorough evaluation of dose assessment team performance was needed to assess the adequacy of the corrective actions for the underlying performance weakness.
- The licensee's backlog of unentered drill performance issues into the corrective action program indicated that the emergency planning department was not utilizing the corrective action program to its full capability. Additional inspection effort was needed to evaluate if the corrective action program is being effectively implemented for emergency preparedness issues.
- Because the licensee did not perform a historical search of condition reports and notifications as part of its extent of condition analysis for Significant Condition Report

(SCR) 2001-0624, that a more extensive independent review, including historical sampling, was required to adequately assess the extent of condition of the root cause.

- The licensee's emergency preparedness self-assessment (performance improvement initiative) was initiated in response to the Alert declaration on June 25, 2001. The primary purpose of the self-assessment was to resolve three issues associated with the Alert declaration; consequently, the self-assessment did not thoroughly evaluate the issues associated with the White inspection findings from reports 50-298/2000-16 and 2001-04. Additional inspection effort was needed to evaluate the adequacy of the self-assessment plan recommendations on improving the emergency preparedness program.

As a result of these concerns, the White inspection finding associated with the failure of corrective actions to prevent recurrence of the performance issue will remain open pending the completion of additional NRC inspection and review to assess the extent of condition of the identified causes and the adequacy of corrective actions.

Report Details

01 Inspection Scope

This supplemental inspection was performed by the NRC to assess the licensee's evaluations of the following inspection findings:

- (1) The formal critique process in the 2000 biennial emergency preparedness exercise failed to identify performance problems related to a risk-significant emergency planning standard (Inspection Report 50-298/2000-16).
- (2) Corrective actions implemented to prevent recurrence of a dose assessment performance weakness identified during the August 29, 2000, biennial exercise were not fully effective in that they were narrowly focused and failed to prevent recurrence of the performance weakness (Inspection Report 50-298/2001-04).

These performance issues were characterized as having low to moderate risk significance ("White") and are related to the emergency preparedness cornerstone in the reactor safety strategic performance area. This supplemental inspection was conducted to provide assurance that the root causes and contributing causes of the two White findings are understood to independently assess the extent of the condition, to provide assurance that the corrective actions for risk significant performance issues are sufficient to address the root causes and contributing causes, and to prevent recurrence of the problems. To accomplish these objectives, the inspectors conducted the following inspection activities:

- Reviewed the root cause analysis associated with the failure of the emergency response organization to identify a degraded core condition for the April 2001 drill (Resolve Condition Report (RCR) 2001-0331).
- Reviewed the root cause analysis associated with the failure to implement effective corrective actions in the area of emergency preparedness (SCR 2001-0624).
- Evaluated the licensee's extent of condition for the root causes associated with the above analyses.
- Verified the adequacy of planned and completed corrective actions associated with the above analyses.
- Reviewed the evaluations and performed an independent extent of condition review for the root causes associated with the above evaluations.
- Performed an independent extent of condition for the root causes associated with the failure of the critique process (RCR 2000-0912). The evaluation of the root cause analysis, extent of condition, and corrective actions for the critique process failure was performed and documented in NRC Inspection Report 50-298/2001-04.

02 Evaluation of Inspection Requirements

This report documents the reviews of the three aforementioned condition reports and presents a summary conclusion based on the integrated assessment of the individual condition report reviews.

Failure of formal critique process to identify performance problems associated with a risk-significant emergency planning standard (RCR 2000-0912)

02.01 Problem Identification

This was previously reviewed in NRC Inspection Report 50-298/2001-04. No significant findings were identified in the inspection report.

02.02 Root Cause and Extent of Condition Evaluation

This was previously reviewed in NRC Inspection Report 50-298/2001-04. No significant findings were identified in the inspection report.

02.03 Corrective Actions

This was previously reviewed in NRC Inspection Report 50-298/2001-04. No significant findings were identified in the inspection report.

02.04 Independent Assessment of the Extent of Condition (71152)

The inspectors interviewed emergency planning, operations, quality assurance, performance analysis, and training department personnel to determine if a lack of performance standards were still present or were responsible for problems in other areas of plant operation. The inspectors also asked the resident inspectors and regional technical personnel if there were other areas where a lack of standards for evaluation of personnel performance could be problematic. Based on the interviews and NRC discussions, the inspectors did not identify additional examples.

The inspectors also reviewed documents to identify if additional examples of a lack of performance standards existed. This document review included, in part, a review of problem identification reports, notifications, emergency preparedness drill evaluation forms, maintenance training lesson plans, fire protection lesson plans, and other procedures.

The document reviews did not identify a generic concern with a lack of performance standards; however, the inspectors did note that two of nine maintenance on-the-job lessons reviewed (Qualification Areas 807001C0208, "Maintain Centrifugal Pumps," and 919101C0209, "Calibrate Scram Discharge Volume Instrumentation") lacked adequate performance standards for some steps of the lessons. The licensee initiated Notification 10123995 to determine if other maintenance procedures lacked adequate performance standards.

Based on the results of the interviews, NRC discussions, and document reviews, the inspectors concluded that the lack of performance standards causing the failure to identify performance problems associated with a risk-significant emergency planning standard did not exist significantly beyond the case related to the August 2000 exercise critique.

Failure to Determine Degraded Core Condition During EP Drill (RCR 2001-0331)

02.01 Problem Identification

- a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions.

The condition report listed the event as self-revealing during the post-drill critique process. The root cause evaluation did not address the question of how the issue was identified. It did discuss the NRC's development of the issue, rather than the details of the licensee's critique process. The issue was identified concurrently by both the NRC and the licensee, since both were present at the drill in which the performance problem occurred.

- b. Determination of how long the issue existed and prior opportunities for identification.

The licensee performed a very limited historical review of Cooper Nuclear Station's experience with the issue. A keyword query of the corrective action system and analysis of the results did not reveal any related occurrences. The inspectors considered this query to be incomplete to search for prior occurrences because it only listed the keywords "EP drill" as the search criterion. Limiting the search to problem identification reports and using the single, specific search criterion of "EP drill" prevented the licensee from identifying earlier related problems that may not have been described with these exact words.

The evaluation described the August 2000 occurrence as a prior event; however, the wrong condition report and apparent cause were referenced. The evaluation listed the problem associated with RCR 2000-0901 as the related event. This event concerned only the failure to followup to obtain a timely reactor coolant sample to support the degraded core condition, rather than the failure to determine the degraded core condition, which was documented in RCR 2000-0909. While the referenced event was correct, the failure to identify the correct evaluation and root cause prevented the evaluator from assessing the validity of the RCR 2000-0909 evaluation and whether the two events were related by cause. The inspectors considered the licensee's determination of the historical perspective of the issue to be incomplete.

- c. Determination of the plant-specific risk consequences (as applicable) and compliance concerns associated with the issue.

The evaluation included a section on safety significance, which accurately summarized the NRC's characterization of the issue at the inspection exit interview. This summary also discussed the NRC's significance determination process screening of the issue. The inspectors considered the licensee's description of the safety significance and compliance aspect of the issue to be valid.

02.02 Root Cause and Extent of Condition Evaluation

- a. Evaluation of method(s) used to identify root cause(s) and contributing cause(s).

The licensee used a combination of structured root cause analysis techniques to evaluate this issue, consisting of events and causal factors and TapRoot® human performance analyses. The inspectors determined that the licensee followed its procedural guidance for performing the Level 2 significance determination and accompanying root cause analysis. The procedure required an apparent cause evaluation to be conducted with an option to expand the evaluation to a root cause evaluation. The licensee performed the root cause evaluation which included an analysis of industry operating experience and extent of condition review. The licensee's evaluation also included the results of two previously performed human error review boards (HERBs) that also used TapRoot® methodology.

- b. Level of detail of the root cause evaluation.

The inspectors determined that the root cause evaluation was not conducted to a sufficient level of detail. The licensee diagnosed the root cause of the failure to determine a degraded core condition as a lack of crew teamwork. The inspectors agreed that this was a contributing cause for the problem. However, the licensee's evaluation contained some unsupported assumptions that affected the ability to perform an objective evaluation. For example, the licensee's TapRoot® troubleshooting guide indicated that training was a candidate root cause area for investigation for this event. The cause investigation worksheet did not evaluate training because the evaluator believed the entire emergency response organization knew that the core was degraded and; therefore, training did not need to be investigated.

The following excerpts from the licensee's evaluation indicated that the investigation of a knowledge deficiency on the part of the Radiological Control Manager (RCM) was eliminated early from the scope of the evaluation:

“The NRC had indicated that more theoretical training is necessary based on a common thread in the two events. The [Human Error Review Board] HERB and investigation determined that this is NOT the case for the RCM. In fact, the opposite is the case. The RCM was so knowledgeable

in the area of dose assessment that he outran the drill scenario, which confused him.”

The results of the HERB contained the following statement that indicated the conclusion (that no additional training was required for the RCM) was not derived in a systematic fashion:

“[The RCM's] technical ability to perform core damage assessment was never in question. His technical ability far exceeds the ability of most individuals onsite in the radiation protection arena.”

As a result, the inspectors concluded that some weaknesses existed in the level of detail of the licensee's root cause evaluation.

- c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

As described in Section 02.01.b, the licensee's evaluation included a review to determine whether similar problems had previously been reported. That review did not yield any additional examples beyond the August 2000 biennial exercise occurrence. The inspectors did not possess any information to the contrary.

- d. Consideration of potential common cause(s) and extent of condition of the problem.

The licensee did not document a review of the root cause evaluation performed for RCR 2000-0909 as part of the evaluation for RCR 2001-0331. Therefore, no consideration of common causes between the two occurrences was documented beyond the statement of the NRC's concerns about the similarities between them. Moreover, the RCR 2001-0331 evaluation did not challenge the validity of the RCR 2001-0909 evaluation to determine if a common causal factor existed.

02.03 Corrective Actions

- a. Appropriateness of corrective actions

The licensee took immediate corrective actions for the individuals involved in the performance error. The licensee conducted HERBs for the emergency director and radiological control manager who participated in the April 2001 drill. The HERBs were conducted using TapRoot® methodology. These individuals were disqualified from their emergency response positions based on the results of the HERBs and requalified after discussions with management and other responders and observation of drills performed by other response teams. The inspectors agreed with the appropriateness of this action.

One of the immediate corrective actions involved the presentation of a white paper entitled “Degraded Core Discussion” to all of the major decision makers for the

various emergency facilities. This paper only discussed a procedural conflict and did not include any theoretical discussion of the indications of core damage that would be appropriate to use in cases of conflicting data on core condition. The licensee stated that the white paper discussion was intended to prevent recurrence of the root cause for the near term. However, the inspectors concluded that this action was not related to the root cause, since the root cause was a lack of teamwork, and the issues discussed in the white paper were all procedural references for determination of degraded core condition. The white paper primarily stated which guidance should be followed. The inspectors agreed that this action was appropriate, but they concluded it did not contribute to correction of the root cause.

The licensee's long-term corrective actions also included providing additional core damage assessment training beyond the normal annual requalification training. This was described in the evaluation as correcting a contributing factor to the problem; however, a need for additional training was not identified in the evaluation for RCR 2001-0331 as a contributing cause. Interviews with the author of the evaluation indicated that the action to conduct additional training was only added based on the licensee's perception of the NRC's emphasis on inadequate training as a root cause and on the explicit request of the emergency director who participated in the April 2001 drill.

The inspectors interviewed three managers who attended the training. All three managers considered the training to be worthwhile. The emergency director for the April 2001 drill informed the inspectors that the failure to determine a degraded core condition would not have recurred during that drill if he had received the training before the drill. The inspectors felt that statement supported the determination of theoretical training as a root cause.

b. Prioritization of corrective actions.

The inspectors concluded that the corrective actions were properly prioritized. Actions of an immediate nature were given the highest priority. A completion date and a responsible manager were assigned for each corrective action.

c. Establishment of a schedule for implementing and completing the corrective actions

The licensee's evaluation established a schedule for the completion of the long-term corrective actions by the end of calendar year 2001. The inspectors concluded that this schedule was acceptable, given the competing priorities that existed for the emergency planning department at the time the evaluation was issued.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

The licensee's long-term corrective actions included: (1) the development of performance-based criteria for evaluating teamwork at each emergency facility during emergency preparedness drills and exercises, and (2) a recommendation to include actual performance of core damage assessment as part of planned classroom activities. The inspectors considered these measures appropriate for determining the effectiveness of the long-term corrective actions.

The inspectors concluded that the root cause evaluation for RCR 2001-0331 contained some weaknesses, but these weaknesses did not invalidate the root cause determination because the corrective actions implemented as a result of this evaluation were appropriate for all causes identified by both the licensee and the NRC.

02.04 Independent Assessment of the Extent of Condition (71152 and 82001.02)

a. Interview and Document Inspection

The inspectors interviewed personnel from emergency preparedness, operations, quality assurance, performance analysis, and chemistry to determine if issues related to the licensee's identified root cause of inadequate teamwork were still present or were responsible for problems in other areas of the organization. Several individuals indicated that the lack of teamwork and communications was the reason for the missed protective action recommendations. None of the individuals interviewed indicated that lack of teamwork and proper communications were common problems at the site.

In addition, numerous documents were reviewed to identify if additional examples of inadequate teamwork existed. The document review included a review of problem identification reports, notifications, and emergency preparedness drill exercise reports. With the exception of drill and exercise reports, no teamwork or communications problems were noted.

After discussions, interviews, and an independent review of various documents, the inspectors did not identify similar problems in other programs.

b. Dose Assessment Walkthroughs

The inspectors administered walkthrough evaluations to four dose assessment teams to determine the extent of condition for the performance-based weakness of failure to identify a degraded core condition. A set of two scenarios was administered separately to two pairs of Emergency Operations Facility (EOF) dose assessment decision makers consisting of a radiological control manager and radiological assessment supervisor. A second set of two scenarios was administered to two pairs of on-shift dose assessment staffs consisting of a shift manager and on-shift radiation protection technician. The scenarios were developed with an endpoint goal for the teams to determine if a degraded core

existed. All information necessary to make this determination was provided at the beginning of the walkthrough.

Three of the four teams completed the scenarios without difficulty, but one of the EOF teams experienced difficulty with one scenario and took 30 minutes to determine whether a degraded core condition existed. The scenario presented conflicting plant instrument indications of whether core damage existed as had been the case for the April 2001 drill. The team performed the scenario without the benefit of support staff that would have generated dose projection results from the computer-driven dose assessment model. Despite this, the inspectors considered that the team's performance in this scenario indicated that knowledge weaknesses existed in how to use field team survey results to resolve contradictory plant instrument data to determine whether a degraded core existed. The team performed well on the second scenario.

Although indications of knowledge weaknesses were evident for only one scenario administered to one of four teams, the inspectors could not conclude that the problem was only an isolated example. The completion of additional theoretical training on core damage assessment by all dose assessment staffs the week preceding this inspection would support a higher proficiency level than was observed for the team in question. Therefore, the inspectors concluded that additional inspection effort was required to adequately assess the extent of condition for the inability to determine degraded core conditions.

Failure to Implement Effective Corrective Actions in the Area of Emergency Preparedness (SCR 2001-0624)

02.01 Problem Identification

- a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions.

The licensee's evaluation determined that the NRC identified the issue. It accurately described the chronology of NRC inspection and enforcement of the issue.

- b. Determination of how long the issue existed and prior opportunities for identification.

The licensee developed three different root cause evaluations that were associated with this finding. The first was written in November 2000 and concerned the root cause for the original performance problem that occurred in the August 2000 biennial exercise. This evaluation was directed by Resolve Condition Report (RCR) 2000-0909. The second evaluation, written in June 2001, addressed the failure to recognize a degraded core condition during the April 2001 drill and was directed by RCR 2001-0331. Those earlier evaluations did not

identify any common causes for the failure of the corrective actions to prevent recurrence of the performance weakness.

The third evaluation, SCR 2001-0624, written in September 2001, investigated suspected inadequacies with the first two evaluations and expanded the problem statement to determine how corrective actions taken for a dose assessment performance weakness resulting in an incorrect protective action recommendation for the biennial exercise were ineffective in precluding recurrence for the April 2001 drill. The evaluation correctly described the background of the issue, beginning with the first performance weakness that occurred during the August 2000 biennial exercise. The evaluation described results of earlier evaluations that were written in response to the two separate performance weaknesses.

- c. Determination of the plant-specific risk consequences (as applicable) and compliance concerns associated with the issue

The evaluation accurately described the nature of the performance problems as affecting a risk-significant emergency preparedness planning standard. It also described the logic of the NRC's Emergency Preparedness Significance Determination Process in classifying the issue as White.

02.02 Root Cause and Extent of Condition Evaluation

- a. Evaluation of method(s) used to identify root cause(s) and contributing cause(s).

The licensee commissioned a condition review team to investigate this issue. The team interviewed drill participants associated with the performance weaknesses and reviewed two earlier root cause evaluations associated with the weaknesses. The team used TapRoot® methodology to determine the cause of the failure to correct the weakness. It also revisited the earlier evaluations. The inspectors determined that the licensee followed its procedures in conducting the investigation and that the use of the TapRoot® methodology was adequate, given the human performance nature of the issues involved.

- b. Level of detail of the root cause evaluation.

The licensee's evaluation of the failure to prevent recurrence of the performance weakness was thorough. The condition review team challenged the lack of a common cause in the evaluations of the two events and reperformed the TapRoot® analyses for those evaluations using a common problem statement (the emergency response organization failed to identify the correct protective action recommendation). Three causes, common to the two performances, were identified. These were:

- Situation not covered by procedures
- Standards, policies, and administrative controls were not strict enough
- Knowledge-based decision required

The condition review team then used these causes as inputs to the larger problem statement to determine the root cause of why corrective actions were not effective in preventing the recurrence of the performance weakness. This analysis yielded two root causes for the overall problem:

- Failure of those involved in the corrective action process to recognize the significance of emergency preparedness performance issues
- Lack of adequate guidance in corrective action program procedures concerning the significance of emergency preparedness performance issues

The inspectors considered the licensee's level of detail in its analysis to be appropriately thorough and understandable.

- c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

The licensee considered both instances of the performance weakness that contributed to the overall problem when developing the root cause. However, once the licensee identified the root cause, its historical review of previous occurrences of similar problems of the same root cause was insufficient. The licensee evaluated the programmatic extent of condition of the failure to understand the correct significance of identified problems, but it did not sample earlier condition reports to determine if a lack of understanding of significance of earlier occurrences was a cause of recurring problems. The inspectors considered the failure to determine a historical extent of condition to be a weakness in the quality of the licensee's evaluation. The adequacy of the consideration of prior occurrences of the problem and knowledge of prior operating experience remains open pending further NRC inspection and review.

- d. Consideration of potential common cause(s) and extent of condition of the problem

Except for the lack of historical search for extent of condition described in Section 02.02.c above, the licensee's extent of condition review for the root cause was sufficiently broad. The licensee evaluated the screening criteria procedures for condition reports for all of the reactor cornerstones to determine if criteria for significance determination in other cornerstones was nonconservative.

Nonconservative significance determination criteria were discovered for the Occupational Radiation Safety, Public Radiation Safety, and Physical Protection cornerstones. Nonconservative significance determination criteria were also discovered for adverse performance indicator trends in all the cornerstones. The licensee's conclusion was that the site probabilistic risk assessment model adequately screened events occurring in the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones. The inspectors considered the licensee's programmatic extent of condition review to be appropriate.

The licensee's methodology succeeded in identifying common causes for the two events. That methodology is described in Section 02.02.b above.

02.03 Corrective Actions

a. Appropriateness of corrective actions.

The licensee included 12 corrective actions and two enhancements as followup to this evaluation. Six of the corrective actions were added based on the licensee's re-evaluation of the previous root cause evaluations for the performance weaknesses. These actions expanded on the actions previously identified for these two evaluations. The immediate action addressing the root cause consisted of distribution of a white paper to the condition review group to inform them of the need for sensitivity to cornerstone issues.

All corrective actions were appropriately linked to root or contributing causes for the performance weaknesses or the significance determination issue. The inspectors considered the corrective actions to be appropriate to the evaluation's results.

b. Prioritization of corrective actions.

The inspectors concluded that the corrective actions were properly prioritized. A completion date and a responsible manager were assigned for each corrective action.

c. Establishment of a schedule for implementing and completing the corrective actions.

The licensee established due dates for each corrective action. Two corrective actions were still open at the completion of on-site inspection. One action item due date had been extended. No problems were identified with the extension.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

Corrective Action No. 10 specifically addressed the need to trend areas within emergency preparedness. The licensee revised Procedure "CAP Deskguide 3 Trend Coding" to include additional keyword coding that would allow easier and more detailed areas for trending of recurring weaknesses and negative trends in drill performance. The inspectors noted that additional keywords were added for trending, but no procedure had been developed that specified how often and with what frequency emergency preparedness issues were to be trended. The licensee stated that Licensing Work Order 4207062 was created to track the licensing commitment to develop an emergency preparedness procedure or guideline on how and with what frequency the department will trend drill weaknesses. The inspectors noted that emergency preparedness department did not perform any

trending in 2000 and 2001. The development of trending data should allow the emergency preparedness department to identify adverse trends and implement corrective actions in a timely manner.

02.04 Independent Assessment of the Extent of Condition (71152)

The inspectors interviewed personnel from emergency preparedness, operations, quality assurance, performance analysis, chemistry, and training organizations to determine if the failure to recognize the significance of a missed protective action recommendation was still present, or whether the broader concern of failing to recognize the significance of other problems was evident in other areas of the organization. Plant personnel acknowledged that, at that time, personnel were not knowledgeable on the significance of emergency preparedness issues.

In addition, documents were reviewed to identify if additional examples of missed significance for plant problems existed. The document review included a review of a small sample of problem identification reports, notifications, and emergency preparedness drill and exercise critiques (2000 and 2001).

The inspectors also reviewed the emergency preparedness self-assessment (performance improvement initiative) that was initiated in response to the Alert declaration on June 25, 2001. That assessment included a discussion of the effectiveness of emergency planning management. As part of that discussion, the assessment noted that the effectiveness and implementation of the corrective action program within emergency preparedness was an area of concern. However, the self-assessment did not evaluate all the issues associated with the White inspection findings from reports 50-298/2000-16 and 2001-04 as deeply as the root cause evaluations. The inspectors determined that this assessment, while broad in scope, was focused primarily on issues arising from the June 25, 2001, Alert declaration. That event was not within the scope of this inspection; therefore, the self-assessment will be reviewed more thoroughly in a future inspection.

The inspectors reviewed emergency preparedness notifications for 2000 and 2001 drill and exercise critiques to determine if other problems identified were improperly classified. The inspectors did not identify any improperly classified notifications.

The licensee's extent of condition was limited to the review of the remaining cornerstones to determine if other issues could result in inadequate corrective actions caused by improper significance determination. The licensee did not complete a review of previous problem identification reports. The licensee looked for areas within Procedure 0.5 CLSS, "Classification of Problem Identification Reports," that could allow similar problems not to be considered significant, until the issue became an NRC "White" finding. The licensee identified similar problems within radiation safety and physical protection cornerstones. Procedure 0.5 CLSS was revised to address problems with emergency preparedness, radiation safety, and physical protection cornerstones. The inspectors reviewed the changes to 0.5 CLSS and determined that the changes should allow the licensee to appropriately classify problems consistent with its program definition of "significant."

In an attempt to determine the extent of condition outside the emergency preparedness organization, the inspectors reviewed approximately 125 summary descriptions of problem identification reports and did not identify any improperly classified notifications. However, based on the limited review, the inspectors were not able to make an assessment as to the actual extent of condition beyond the emergency preparedness organization. Accordingly, additional NRC inspection is required to independently assess the extent of condition.

Overall, the entry of emergency preparedness weaknesses into the corrective action program has not been timely. Problem Identification Report 4-13921 dated January 30, 2001, identified that only 28 of 45 drill weaknesses identified during 2000 emergency response drills were entered into the corrective action program. All 2000 drill weaknesses were entered into the corrective action system by April 5, 2001. Eight emergency response drills were conducted in 2001. The first four drills occurred during April and May, and all the weaknesses were not entered into the corrective action program until November 12, 2001. The remaining four drills were evaluated and weaknesses were entered into the corrective action program by November 21, 2001. The licensee entered "significant" weaknesses into the corrective action program almost immediately (<10 days from date of drill), but this consisted of only 20 out of 96 identified weaknesses. For the less significant weaknesses, up to 10 months passed before they were entered into the corrective action system.

The licensee was conducting drill critiques and documenting deficiencies, weaknesses, and improvement items in drill reports; however, many of the weaknesses were not entered into the corrective action program for long periods of time. The emergency preparedness organization was not using the site corrective action program effectively. As discussed previously, this was an area of significant concern identified by the licensee's self-assessment conducted in August 2001. The entry backlog greatly diminished the ability of the emergency preparedness organization and management to trend and determine the effectiveness of corrective actions taken. Based on interviews with various site personnel and recent changes within the emergency preparedness organization, it appeared that the corrective action program was now being utilized by the emergency preparedness organization. The inspectors were unable to make a determination as to the long-term effectiveness of the proper use of the correction action program by the emergency preparedness organization. As a result, additional followup inspection was needed.

Conclusions

The inspectors concluded that additional inspection effort was required to adequately assess the extent of condition reviews of the various causes identified in the licensee's evaluations. This conclusion was based on the following four indications:

- Problems noted with one EOF team's determination of degraded core status indicated that a more thorough evaluation of dose assessment team performance was needed to assess the adequacy of the corrective actions for the underlying performance weakness.

- The licensee's backlog of unentered drill performance issues into the corrective action program indicated that the emergency planning department was not utilizing the corrective action program to its full capability. Additional inspection effort was needed to evaluate if the corrective action program is being effectively implemented for emergency preparedness issues.
- Because the licensee did not perform a historical search of condition reports and notifications as part of its extent of condition analysis for SCR 2001-0624, a more extensive independent review, including historical sampling, was required to adequately assess the extent of condition of the root cause.
- The licensee's August 2001, emergency preparedness self-assessment focused primarily on issues arising from a June 25, 2001 emergency event and did not evaluate the issues associated with the White inspection findings as deeply as did the root cause evaluations. Additional inspection effort was needed to evaluate the adequacy of that self-assessment for value added in the licensee's understanding of the identified emergency preparedness issues.

As a result of these concerns, the White performance issue associated with the failure of corrective actions to prevent recurrence of the performance issue will remain open pending the completion of additional NRC inspection and review to assess the extent of condition of the identified causes and the adequacy of corrective actions.

03 Management Meetings

Exit Meeting Summary

The inspectors provided a debrief of inspection findings to Mr. D. Wilson, Site Vice President, and other members of site management at the conclusion of the on-site inspection effort on November 16, 2001. The inspectors conducted a final exit interview via telephone on December 11, 2001, with Mr. M. Coyle, Assistant Vice President, Nuclear, and other members of site management.

The inspectors asked the licensee whether any of the material they had been presented during the inspection was proprietary. None was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Bednar, Coordinator, Emergency Preparedness Training
M. Boyce, Senior Manager, Regulatory Affairs
G. Casto, Manager, Emergency Planning
P. Caudill, General Manager, Engineering and Technical Services
T. Chard, Manager, Chemistry and Radiation Protection
D. Clark, Operations Engineer
M. Coyle, Assistant Vice President, Nuclear
F. Diya, Manager, Plant Engineering
R. Gardner, Senior Manager, Quality Assurance
P. Hays, Acting Manager, Emergency Preparedness
B. Houston, Manager, Quality Assurance Operations
J. Hutton, Plant Manager
A. Jacobs, Acting Manager, Performance Analysis
K. Kirkland, Manager, Nuclear Information Services
D. Kunsemiller, Manager, Risk and Regulatory Affairs
D. Linnen, Senior Manager, Training
W. Macecevic, Manager, Operations
D. Meyers, Senior Manager, Site Support
J. Ranalli, Senior Manager, Engineering
L. Schilling, Manager, Administrative Services
J. Sumpter, Project Manager, Licensing
J. Westbrook, Supervisor, Maintenance/Radiation Protection and Chemistry Training
D. Wilson, Vice President, Nuclear

NRC

M. Hay, Resident Inspector
G. Good, Chief, Plant Support Branch

DOCUMENTS REVIEWED

Emergency Plan and Implementing Procedures:

Procedure No.	Title	Revision No(s).
N/A	Cooper Nuclear Station Emergency Plan	36
EPIP 5.7.1	Emergency Classification	28
EPIP 5.7.6	Notification	31C2
EPIP 5.7.17	Dose Assessment	25
EPIP 5.7.18	Off-Site and Site Boundary Monitoring	18

Other Licensee Procedures:

Procedure No.	Title	Revision No(s).
0.5	Conduct of the Problem Identification and Resolution Process	27
0.5 PIR	Initiation of Problem Identification Reports (PIRs)	2
0.5 CLASS	Classification of Problem Identification Reports (PIRs)	3, 6
0.5 RCR	Preparation of Resolve Condition Reports	2, 3
0.5 SCR	Preparation of Significant Condition Reports	2, 4
NTP 5.4	On-the-Job Training and Task Performance Evaluation	2
CAP Deskguide 3	Trend Coding	18
CAP Deskguide 11	CNS Risk Significance Determination Screening Process	1
0-PI-01, Attachment 4	PI Definition and Basis Form	0

Miscellaneous Documents:

Nebraska Public Power District Letter NLS2001081, dated September 13, 2001, "Reply to Notice of Violation NRC Letter No. EA-01-154"

Resolve Condition Report 2001-0331 Root Cause Evaluation, "Failure to Determine Degraded Core Condition During EP Drill," dated April 17, 2001

Resolve Condition Report 2000-0909 Root Cause Evaluation, "Dose Assessment Process Failure to Identify a Degraded Core Condition," dated November 2, 2000

Resolve Condition Report 2000-0912 Root Cause Evaluation, "Inadequate Emergency Preparedness Critique," dated November 27, 2000

Significant Condition Report 2001-0624 Root Cause Evaluation, "Failure to Implement Effective Corrective Actions in the Area of Emergency Preparedness," dated June 28, 2001

Significant Condition Report 2001-0577, "Untimely Notification, Staff Augmentation, and Facility Activation," dated August 21, 2001

Cooper Nuclear Station Quality Assurance Audit Reports 00-02 and 01-01, "Emergency Preparedness"

Drill Reports for April 11, April 25, May 2, May 16, June 5, July 11, July 18, and September 11, 2001, emergency preparedness drills

Emergency Preparedness Department Guide #2 (EPDG #2), Attachment H-1, "Cooper Nuclear Station Drill and Exercise Manual," Revision 7

Lesson File No. Gen 005-10-01, "CNS Fire Brigade," Revision 3

Lesson File No. GEN005-10-02, "Personal Protective Equipment," Revision 1

Lesson File No. GEN005-10-03, "Fires and Extinguishing Agents," Revision 0

Lesson File No. GEN005-10-04, "Installed Plant Fire Protection Systems," Revision 1

Lesson File No. GEN005-10-05, "Forcible Entry/Portable Fire Fighting Equipment," Revision 1

Management Observation of Training Activity (Observation Details) for the dates of February 13, February 20, April 17, June 14, August 16, September 11, September 27, and October 29, 2001.

On-the-Job Training Lesson No. SKL931-10-3C, "Calibrate Scram Discharge Volume Instrumentation," Revision 1

On-the-Job Training Lesson No. SKL918-20-2C, "Calibrate Intermediate Range Monitor," Revision 1

On-the-Job Training Lesson No. SKL807001C, "Maintain Centrifugal Pumps," Revision 3

On-the-Job Training Lesson No. SKL816240C, "Maintain Control Rod Drive," Revision 3

On-the-Job Training Lesson No. SK805045C, "Establish/Remove Freeze Seals," Revision 3

On-the-Job Training Lesson No. SKL701065C, "Electrical Inspection of MOV's," Revision 2

On-the-Job Training Lesson No. SKL704008C, "Install Low Voltage Splices (<600V)," Revision 3

On-the-Job Training Lesson No. SKL704009C, "Perform EQ Splices (Raychem)," Revision 1

Lesson No. CNSEP0-01-13, "Dose Assessment/PARs"

Training Module EP01, "EP Fundamentals: Emergency Planning"

Training Module EP02, "EP Fundamentals: Emergency Response"

Training Module EP03, "Emergency Classification"

Training Module EP04, "Protective Action Recommendations"

Training Module EP05, "Dose Assessment"

Training Module EP01, "Core Damage Assessment"

EOF Performance Evaluation dated April 11, 2001

Emergency Preparedness External Assessment (August 12-14, 2001)

Notifications

10117515 10123005

Problem Identification Reports (PIRs)

4-11163	4-11230	4-11169	4-13926	4-13921	4-13925
4-14595	4-13423	4-10567	4-10818	4-10828	4-11168
4-11371	4-11521	4-11609	4-11883	4-12113	4-12713
4-12800	4-132584	4-11259	4-12238	4-13834	

Resolve Condition Reports

2000-0900 2001-0071

Work Orders

4207062 4203617 4203644

Acronyms Used

EOF emergency operations facility
HERB human error review board
RCM radiological control manager
RCR resolve condition report
SCR significant condition report