UNITED STATES
NUCLEAR REGULATORY COMMISSION
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September 20, 2000

MEMORANDUM FOR: William M. Dean, Chief
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Division of Inspection Program Management
Office of Nuclear Reactor Regulation

FROM: Ken E. Brockman, Director, Division of Reactor Projects
/RA/ by Elmo E. Collins

SUBJECT: AGENCY RESPONSE TO DEGRADED CONDITIONS AT POWER REACTORS

Enclosed is a copy of the white paper discussing the region's review of our response to the degraded splice treatments found at Cooper Nuclear Station. This review was conducted by a team of three certified inspectors from May 30 through August 5, 2000. The details of the review are documented in the paper, including recommendations for changes to baseline inspection procedures and a recommended change to Management Directive 8.3, "Incident Investigation." Should you have any questions concerning this paper, please feel free to discuss them with David Loveless at 817/860-8161 or myself at 817/860-8248.

Enclosure:
Cooper White Paper w/attachments

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Cooper White Paper

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Review Topic:	Agency Response to Degraded Conditions at Reactors
Review Location:	Region IV office
Dates:	May 30 through August 5, 2000
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Executive Summary

During this evaluation, a team of inspectors assessed the need for and/or the best method for responding to risk-significant degraded conditions, identified at commercial power plants, that do not meet the Management Directive 8.3 definition of an event. The team evaluated the ability of the NRC to respond to risk-significant degraded conditions within the confines of the current reactor oversight process and compared this to the method used by Region IV to respond to the degraded conditions at Cooper; namely a special inspection. The team then reviewed two additional degraded conditions: the failure of residual heat removal pump bearings at Arkansas Nuclear One and design problems with salt water system valves at San Onofre Nuclear Generating Station, to compare the Region IV response against the team's recommendations.

The team concluded that most degraded conditions identified at reactor facilities would best be evaluated and assessed under the current reactor oversight process, through the risk informed baseline inspection program. However, a small fraction of risk-significant degraded conditions warranted real-time review and evaluation that are not possible within the scope of baseline inspection procedures. These conditions would exhibit the following characteristics:

- The condition places the plant in a configuration that results in a conditional core damage probability greater than 1E-5, and

- The condition is not corrected or adequately compensated for, such that the plant continues to be in a risk-significant configuration.

The team recommends that Management Directive 8.3 be modified, as provided in Attachment 1 to this paper, to permit Regional Administrators to charter a special inspection for risk-significant conditions that have not been corrected nor compensated for by the licensee, such that the added risk continues or is suspected to be continuing. Additionally, the team recommended increasing the scope of several baseline inspection procedures to permit a broader ability to conduct real-time inspection of degraded conditions.

NRC Response to Identified Risk Significant Conditions

Purpose:

The purpose of this paper is to evaluate the need for and/or the best method for responding to identified risk-significant conditions at commercial power plants that do not meet the Management Directive 8.3 definition of an event. This subject will be explored via a case study of the agency's response to the identified degraded environmentally qualified splice treatments at the Cooper Nuclear Station.

Background:

In late Fall 1999, Nebraska Public Power District submitted several license amendment requests associated with the use of GE-14 fuel scheduled for Cycle 19. In evaluating NRC questions related to these requests, licensee engineers determined that the analyzed peak drywell temperature had always been greater than the design basis peak temperature. The peak accident temperature was determined to be 340◦ F, versus the previously analyzed value of 295◦ F. Engineers performed an assessment and determined that all environmentally qualified equipment in the drywell was operable. Specific operability evaluations related to the increased accident temperatures were developed and scheduled for presentation to plant management.

The resident inspectors reviewed this issue and determined that, once these operability evaluations were published, they should be reviewed. While evaluating the ongoing plant status for restart, the resident inspectors questioned the qualifications of equipment in the drywell and steam tunnel including splices with Okonite tape treatments and the use of Buchanan terminal blocks. As a result of these concerns, the NRC requested a conference call with the licensee to discuss the issues. During the call, the licensee verbally committed to perform a spot check of electrical boxes inside the drywell that were known to contain Okonite tape.

On April 14-15, 2000, a resident inspector accompanied an electrical technician into the drywell as part of Inspection Procedure 71111, Attachment 20, “Refueling and Outage Activities.” The resident inspector observed that, on all splices inspected, the outer tape ends were loose. Additionally, on several splices the inner tape was visible. The craft indicated that the inspected splices were “acceptable” as found and no further action was required.

On April 16, 2000, NRC participants held a second conference call to discuss the plant’s readiness for restart. Licensee management informed the NRC that a plant restart was scheduled for that evening. NRC management expressed concern that the licensee was planning a restart when the implications, significance, and the scope of the degraded splice treatments were not clearly understood. As a result, the plant manager stated that he would hold plant startup until plant personnel better understood the issues.

On April 19, 2000, the Director, Division of Reactor Projects, in consultation with the Regional Administrator, chartered a special inspection to review the circumstances surrounding the identification and evaluation of degraded environmental qualification treatments and the corrective actions being taken by the licensee.

The Need for Focused Inspection:

The team concluded that, regardless of programmatic methods, an immediate, focused inspection was required for the circumstances at Cooper. As of April 18, 2000, the list of equipment potentially affected by degraded splice treatments included the high pressure coolant injection and the reactor core isolation cooling systems. A preliminary risk evaluation, conducted by the senior reactor analyst, concluded that the loss of these systems during a medium-break loss of coolant accident could result in a YELLOW finding. Additionally, resident inspectors had expressed concerns, and provided supporting examples, that the licensee was not conducting an adequate evaluation, and may conclude that plant restart was appropriate without fully addressing the operability of risk-significant systems. The potential for a plant restart prior to evaluating and repairing the splice treatments in the drywell and steam tunnel represented an ongoing and risk-significant safety issue. Therefore, Region IV management decided that a focused inspection effort was necessary.

Evaluation of Methods for Conducting Inspections of Degraded Conditions:

Given that a focused inspection was necessary, the team reviewed two potential methods for conducting such an inspection: (1) inspection fully within the scope of the baseline inspection program, and (2) a special inspection. Additionally, the team evaluated the usefulness of the baseline inspection program in identifying and responding to risk-significant degraded conditions.

Use of the Baseline Inspection Program:

The team reviewed applicable reactor oversight program documents to evaluate the process necessary to identify and review a risk-significant degraded condition at the plant. The team concluded that most degraded conditions identified at reactor facilities would best be evaluated and assessed under the current reactor oversight process with some minor modification to the scope of several procedures. However, the reactor oversight process was determined to be too slow to respond to a small fraction of degraded conditions. This was the case for conditions that had not been corrected by the licensee.

- Baseline Inspection Procedures:

  The team reviewed all of the baseline inspection procedures. Each procedure was evaluated to determine if the scope permitted inspection of an ongoing safety issue, including the degraded splice treatments identified at Cooper, and to determine which procedures could be easily modified to better permit real-time review of degraded plant conditions.

The team concluded that the baseline inspection program was generally broad in scope and permitted review of a wide range of degraded conditions. Recommendations were provided for revising the scope of several procedures to broaden the scope. However, several areas inspected during the Cooper special inspection were outside the baseline scope, even after implementing the recommended procedure revisions. The team also found that the number of annual occurrences for several baseline procedures at Cooper would have been dominated by this one narrow issue. The specific review comments are included as an attachment to this paper. The following summarizes the findings:

> The team determined that with some revision, the scope of the baseline inspection procedures was sufficient to review most risk-significant degraded conditions. Given that a licensee is responding to correct the condition, the program provides for a review of licensee's safety evaluations, modifications, maintenance, surveillance, and compensatory actions. The scope of the procedures provides sufficient information for the NRC to determine that affected risk-significant equipment has been restored to an operable condition or compensated for. Some of the procedures require adjustments to the scope to permit inspection in areas when the licensee has not formally addressed the issues (i.e., an operability evaluation not performed).
>
> However, at Cooper, NRC management had indications that the licensee's corrective action program was not providing an appropriate and timely response to the conditions observed. Therefore, the types of documents and actions inspected by the baseline program did not exist. The inspection activities conducted during the Cooper special inspection that would be outside the baseline scope, even after implementing the recommended procedure revisions were as follows:
>
> - Inspection of the material condition of as-found splices;
> - Evaluation of craft training on the proper installation of splice treatments once significant training issues were identified; and
> - Inspections of ongoing corrective action development prior to restart.
>
> Additionally, the annual number of occurrences for several baseline inspection procedures at Cooper would have been dominated by this one narrow issue. The team concluded that this was beyond the sampling philosophy of the baseline program.

- <u>Significance Determination Process</u>:

The baseline inspection process essentially ends at the identification and characterization of a finding. At that point, Manual Chapter 0609, Issue Date 04/21/00, "Significance Determination Process," is followed to determine the safety significance of

the finding. This process provides a risk significance characterization of licensee performance issues. When the performance issue results in a degraded plant condition, this process is an excellent tool for evaluating and assessing the issue. However, as described below, this process can take up to 120 days to establish a final significance. This time delay is the most critical weakness in using the baseline inspection program when a real-time response to a degraded condition is needed.

The significant determination process is currently being used to determine the significance of the performance issues identified during the special inspection at Cooper. Once inspection is completed, the process should result in a similar significance whether the inspection was conducted under the baseline or a special inspection was performed.

Chapter 0609 aids NRC inspectors in determining the safety significance of inspection findings, using risk insights where appropriate. Inspection observations are first assessed in accordance with Supplement 2 to determine if a significance determination process entry requirement has been met. Performance issues identified at Cooper clearly met the entry requirements because the degraded splice treatments were in mitigating systems and system components that effect the containment barrier.

Once entry conditions are met, Chapter 0609 directs the user to the applicable cornerstone significance determination process. The significance determination of reactor inspection findings for at-power situations was selected because the degraded conditions identified at Cooper were only significant when the plant was pressurized and the potential for a high energy line break existed. It should be noted that the degraded conditions had existed for an extended period of time during power operations at Cooper.

The Phase 1 characterization and initial screening of the performance issues at Cooper indicated a potentially significant issue. Similarly, the Phase 2 initial risk significance approximation and basis indicated a potentially significant issue. Conservative assumptions indicated findings in the WHITE and YELLOW range. The Phase 3 risk significance finalization and justification are still being conducted. It has been 4 months since the original observations, yet the process, being vigorously pursued has not yet resulted in a color for the performance issue findings identified.

- <u>Reactor Assessment Process</u>:

  Manual Chapter 0305, “Operating Assessment Program,” issue date 4/24/00, provides guidance for collecting information from inspection findings to assist management in making timely and predictable decisions regarding appropriate agency actions used to oversee, inspect, and assess licensee performance. Chapter 0305 states, “If an inspection finding is identified during the quarter that is risk significant (i.e., greater than green) the regional office may address this issue without waiting until the end of the

quarter, if appropriate . . . Additionally, the agency will not wait until the annual Agency Action Review meeting to address plants with significant performance problems."

However, the chapter defines an inspection finding stating, in part, that findings are assigned a color based on their risk significance as an outcome of the significance determination process. Complicated findings, similar to those addressed at Cooper, would not be addressed by the reactor assessment process until the significance determination process was complete. The findings at Cooper Nuclear Station have not yet been assigned a color via the significance determination process. Therefore, regardless of the inspection method, findings would not be assessed in the Chapter 0305 process in a real-time manner.

- Supplemental Inspection:

  If we assume that the result of inspection findings is a degraded cornerstone, the applicable procedure for supplemental inspection is Inspection Procedure 95002, "Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area." This procedure is only implemented in accordance with the Agency Action Matrix, and is therefore, not conducted on a real-time basis.

  This procedure was designed to provide assurance that root causes and contributing causes are fully understood and to independently assess the extent of condition for risk significant issues. The inspection would also ensure that licensee corrective actions to risk significant performance issues are sufficient to address the root causes and contributing causes, and to prevent recurrence. It should be noted that Region IV's response to the conditions at Cooper Nuclear Station included the inspection of the areas described in Inspection Procedure 95002.

- Timing of Inspections:

  The team determined that the risk-informed baseline inspection program was generally adequate to assess risk-significant degraded conditions identified at reactor facilities provided the risk related to the event is reduced by correcting the condition or by compensatory action. However, the identified discrepancies at the Cooper Nuclear Station had not been corrected nor compensated for by the licensee. As such, real-time inspection was necessary to ensure that the licensee corrected the risk significant degraded condition. This was important in light of the licensee's stated intention to restart the plant. Baseline inspection procedures that require a review of licensee actions after the corrective action process had completed, were insufficient to conduct the necessary real-time reviews.

Use of Special Inspection:

In making the determination to conduct a special inspection at the Cooper Nuclear Station, Region IV used Management Directive 8.3, Draft 03/00, “NRC Incident Investigation Program.” Although an “event” had not occurred, Region IV management assessed the known information related to the identified condition at Cooper Nuclear Station. On April 16, 2000, NRC technical specialists from headquarters, regional staff, and the resident staff participated in a conference call with plant management and environmental engineering staff. NRC personnel noted that the plant staff, and engineering personnel, had not properly evaluated the significance of the Okonite tape deficiencies nor did they recognize the purpose of the degraded outer tape layer. Additionally, Cooper management continued to indicate that the plant was ready for restart and that reactor restart was eminent. While a formal conditional core damage probability had not been performed, senior reactor analysts indicated that if the two systems known to be affected were inoperable, related performance issues would be YELLOW based on a Phase 2 significance determination process evaluation.

It was not obvious that baseline inspection could cover a real-time inspection response to Cooper. Licensee field personnel had determined that no deficiency existed and concluded that an operability evaluation of the condition was not necessary. Corrective action documents related to the degradation of the outer wrap Okonite tape were not designated as requiring resolution prior to restart. Discussions with senior plant management indicated that they had not assessed the scope of the condition or the potential impact to safety system operability. In addition, preliminary NRC safety assessments indicated that, if the licensee restarted the reactor, they would be placing the plant in a significantly higher risk condition. Based on the potential risk significance, to better understand the cause(s) of the degraded environmental qualification treatments, and to assess corrective actions taken to prevent recurrence of the situation, the NRC commenced the special inspection on April 19, 2000.

The inspection charter, signed by the Director, Division of Reactor Projects, clearly indicated that portions of the inspection were beyond the scope of the baseline inspection program. Region IV management involved in the decision stated that this inspection was necessary to accomplish the NRC mission. In addition, the chartering of a special inspection ensured that licensee management fully comprehended the importance and significance that the NRC placed on the identified degraded conditions.

Problem Identification and Resolution at Cooper:

Throughout the Region IV decision-making effort, management was concerned with initial lack of a questioning attitude by the plant staff and the missed opportunities to identify and correct some of these issues in the past two years. Specifically:

- On the initial containment entry, maintenance personnel asked the resident inspector what they should do after identifying the loose tape on the environmentally qualified splices;

- Craft personnel stated that the observed condition of the splice treatments was not abnormal, and did not consider it to be of concern;

- Only after further discussion with the resident inspectors did the craft identify the need to document the degraded taped splice treatments in their corrective action program; and

- During the conference call on April 16, 2000, Region IV management had to strongly voice objections to the plant staff's conclusion that the splices treated with Okonite tape were acceptable as found. Plant management's discussion indicated that the scope and significance of the issue needed further evaluation and assessment.

- Additionally, plant management did not convey an understanding of the design requirements or the necessity of installing the splice treatments in a configuration that complied with those requirements.

The team concurred with the Region IV management conclusion that these observations indicated weakness of the licensee's corrective action program in that it did not identify, evaluate, and correct the conditions in a timely manner. The corrective action program weakness, related to the degraded splice treatments at Cooper, exhibited the following indicative characteristics:

- Licensee management had not corrected nor compensated for the condition, and, as such,

- the licensee planned to restart the plant, placing the plant in a significantly higher risk configuration.

Risk-Significant Degraded Conditions at Other Licensed Facilities:

The team reviewed two additional high-risk conditions that had been identified within the previous 6 months. One of the conditions had been immediately inspected by a special inspection team while the second was not. The team members assessed the circumstances and conditions surrounding the events to gain insights into the need to conduct special inspections for degraded conditions.

- ANO Degraded Residual Heat Removal Pumps:

  The team evaluated the Region's response to the identification of degraded residual heat removal pumps at ANO.

  On February 5, 2000, licensed operators were shutting down Unit 1 to repair a reactor coolant pump anti-rotation device. The decay heat removal pumps were required to cool down the plant. When the operators attempted to place one of the pumps in

service, the high bearing temperature annunciator alarmed in the control room. The operators secured the pump and started the B train pump. After a short period, operators received an alarm indicating high bearing temperature on Pump B. As a result of having both trains of decay heat removal inoperable, the unit entered Technical Specification 3.0.3. However, without decay heat removal pumps, operators were required to maintain the reactor coolant system above the boiling point using the steam generators and the main condenser for heat removal.

The senior reactor analysts evaluated this condition and concluded, based on available information, and determined that the conditional core damage probability was at least in the mid E-5 range and could be as high as 1E-3.

Regional management decided that more information was needed and that the ongoing risk associated with the plant status was high enough that a special inspection was necessary. A special inspection was chartered on February 8, 2000, by the Director, Division of Reactor Projects. The charter required the team to develop the sequence of events, identify failed barriers that should have prevented degradation of the pumps, and identify issues related to the facility restart.

- <u>SONGS Under Designed Salt-Water Valves:</u>

  Team members also reviewed the agency's evaluation of air accumulator leakage at SONGS that resulted in the inoperability of salt water cooling system valves.

  On April 26, 2000, licensee engineers determined that multiple salt water cooling system valves were inoperable in both units, and had been since November 1998, as the result of leakage from emergency air accumulators. Lowering pressures in the accumulators could have resulted in the valve not remaining in its safety position following a loss of instrument air. All of the saltwater cooling pump discharge valves, and the component cooling water return isolation valves from shutdown cooling heat exchangers, in both units, were incrementally found to be inoperable.

  Initial assessments performed by the senior reactor analysts indicated that related performance issues could be RED in accordance with a Phase 2 significance determination process evaluation. However, upon identification of the deficiencies, licensee personnel took compensatory action to ensure continued operability of the valves. Maintenance workers installed blocks, temporarily modifying the valves to ensure that they would remain open during accident conditions.

  Region IV management reviewed the condition to assess the need for additional inspection. Additional inspection was deemed warranted based on the high potential risk significance of the deficiencies. However, because the licensee had taken compensatory actions to ensure continued operability of the valves, there was no immediate safety issue. Therefore, baseline inspection was considered to be the appropriate method to evaluate and assess the licensee's past performance.

The team assessed the conditions, as understood by regional management, and determined that the special inspections were chartered at Cooper and ANO because the presenting condition was not corrected nor compensated for and the high estimated risk continued. At SONGS, the condition was compensated for almost immediately. Therefore, the time necessary for the licensee to respond to the degraded condition and for the reactor oversight program to assess that response after completion was acceptable.

Conclusions:

The team concluded that most degraded conditions identified at reactor facilities could be adequately evaluated and assessed under the current reactor oversight process, through the risk-informed baseline inspection program with some recommended changes in procedure scope. The baseline program was developed, from its conception, to identify, select, and review the most risk-significant facets of licensee operation, and is clearly the best method for identifying and evaluating risk significant conditions at commercial reactors. Additionally, the reactor oversight process is a preplanned, consistent program for inspecting and evaluating nuclear power plants. Nuclear utilities, our largest stakeholders, have expressed a level of comfort with the predictability of the program. For these reasons, it is in the agency's best interests to conduct as many necessary reviews as possible within the confines of the baseline inspection program.

However, a small fraction of risk-significant degraded conditions warranted real-time review and evaluation that were not possible within the scope of baseline inspection procedures. These conditions would exhibit the following characteristics:

- The condition places the plant in a configuration that results in a conditional core damage probability greater than 1E-5, and

- The condition is not corrected or adequately compensated for, such that the plant continues to be in a risk-significant configuration.

The team also concluded that attempts to conduct the reviews necessary at Cooper under the baseline inspection program would have resulted in utilizing a large number of occurrences for several procedures and significantly skewing the selection sample.

Recommendations:

1. To ensure inspection of the small fraction of risk-significant degraded conditions that warranted real-time review and evaluation, the team recommended that the program office modify Management Directive 8.3 to permit regional administrators to charter special inspections for identified conditions. These conditions must meet the following three criteria: (1) The condition causes an estimated conditional core damage probability greater than 1E-5; (2) the condition has not been corrected nor compensated

for by the licensee; and (3) the added risk continues or is suspected to be continuing. The recommended revision to Management Directive 8.3 is provided as Attachment 1 to this paper.

2. The team found that some of the procedure scopes were more narrow than necessary and could be easily expanded to improve the agency's ability to review degraded conditions. Specific recommendations for scope revision were documented in Section 3, "Procedures for Reviewing Degraded Reactor Equipment Conditions," in Attachment 2 to this paper.

Attachment 1
Recommended Changes to
Management Directive 8.3

The following changes were prepared to implement the recommendations of the team. The sections of Management Directive 8.3 are indicated, and the recommended changes are clearly indicated in red. The addition of Part IV to the management directive is recommended to provide clear guidance on how a special inspection is to be initiated and conducted.

Revision to Main Body:

(8.3-01)

> It is the policy of the U.S. Nuclear Regulatory Commission to ensure that significant operational events involving reactor and materials facilities licensed by the NRC are investigated in a timely, objective, systematic, and technically sound manner; that the factual information pertaining to each event is documented; and that the cause or causes of each event are ascertained. The events may involve responses by either an incident investigation team (IIT) or a less formal augmented inspection team (AIT) for certain safety-significant operational events. These are the two types of responses included in the incident investigation program. Also, when an event occurs, or a risk-significant degraded condition is identified, a Special Inspection (SI) team may be formed depending upon the level of response required.

Revisions to Part 1:

Special Inspection (SI) (3)

> This inspection is similar to an AIT inspection, except that the group generally is smaller than a team (less than four inspectors) and generally is not augmented by personnel from headquarters or other regions. In addition to the review of a significant operational event, a special inspection may be conducted to review identified risk-significant degraded conditions. The SI will be chartered by the appropriate regional administrator and the inspectors will report to the applicable regional branch chief.

Coverage (A) (continued)

Risk-Significant Degraded Condition (6)

> A risk-significant degraded condition is defined as an abnormal condition identified at a commercial nuclear reactor that exhibits the following three characteristics:

1. The condition causes an estimated conditional core damage probability greater than 1E-6;

2. the condition has not been corrected or compensated for by the licensee, and;

3. the added risk continues or is suspected to be continuing.

Revision to Part 1 Appendix 1:

The lack of complete information about an event or degraded condition at the time of the NRC response decision focuses attention on the uncertainty of influential assumptions and their effect on the risk significance. Inspection Procedure 71153, "Event Followup", discusses inspector inputs to risk analysts that are needed to understand the risk significance. For example, if the effectiveness of EDG recovery is uncertain and near-term loss of the EDG dominates risk estimation for the event, then a judgement must be made as to the likelihood that deficiencies will be found in the licensee's procedures, training, and equipment for EDG recovery. NRC should assess the potential influence on risk of the following:

The table below lists event response inspections as a function of CCDP. The overlap of inspection types relative to CCDP levels provides the opportunity to select one of two inspection options based on factors such as uncertainty of the risk estimate coupled with the deterministic insights. Risk insights should also influence the number and expertise of inspectors in the response inspection. Additionally, a special inspection may be chartered for degraded conditions, which don't meet the definition of an operational event, with CCDP values greater than the upper bound (1E-4) listed in the table.

Addition of Part IV:

Part IV

Special Inspection

The investigatory initiative involving a response by the inspectors conducting a special inspection is described.

Objectives of a Special Inspection (A)

Conduct a timely, thorough, and systematic inspection related to significant operational events or significant degraded conditions at commercial nuclear reactors. (1)

Assess the health and safety significance of the event and communicate to regional management the facts and safety concerns related to the event or condition so that appropriate followup actions can be taken. (2)

Collect, analyze, and document factual information and evidence sufficient to determine the cause(s) and circumstances pertaining to the event or condition. (3)

Scope of a Special Inspection (B)

The SI response should emphasize fact finding and determination of probable cause(s), as well as the circumstances relevant to issues directly related to the event or degraded condition. (1)

The SI response should be sufficiently broad and detailed to ensure that the event and related issues are well defined, the relevant facts and circumstances are identified and substantiated by the information and evidence associated with the event or degraded condition. The inspection should consider the adequacy of the licensee's actions during the event or in response to the degraded condition. (2)

The regional administrator shall define and revise the scope of the special inspection, as appropriate, in a written charter. (3)

Schedule (C)

The SI must be activated as soon as practicable after the potential health and safety significance of the event or condition is determined.

The SI must prepare and transmit its report to the appropriate regional administrator within 30 days from activation, unless relief is granted. A copy of the report will be placed in the Public Document Room (PDR) immediately after it is provided to the affected licensee. (2)

Team Composition and Qualifications (D)

The SI will be composed of resident inspectors and/or technical experts from the responsible regional office. (1)

Duties (E)

The SI is authorized to pursue and is responsible for pursuing all pertinent aspects of an operational event or degraded condition. The following duties of NRC offices are in addition to those defined elsewhere in this directive and handbook.

Regional Administrators (a)

Determine, in coordination with NRR, which operational events or degraded conditions warrant an SI response. (i)

Evaluate if and when the SI should be upgraded to an augmented inspection team (AIT) and, in consultation with the Director of NRR and Incident Response Operations, recommend to the EDO that an AIT response is warranted. (ii)

Regional Division Director (b)

Staff, coordinate, and approve the performance of SIs. (i)

Prepare, in coordination with the regional administrator, a written charter for the SI. The charter shall include the basis for the formation of the SI. (ii)

Ensure that the SI response is initiated, defined, and conducted in a manner that achieves the objectives. (iii)

Regional Branch Chief (c)

Direct and supervise the SI in accordance with the written charter. (i)

Issue a periodic Daily Staff Note and Preliminary Notification, if warranted, to the EDO when an SI response is implemented. Provide updates, as appropriate. (ii)

Identify followup actions needed based on the SI findings and forward to the appropriate headquarters office for action. (iii)

SI Lead Inspector (d)

Provides direct oversight of the SI inspectors and ensures that the objectives and schedules are met for the inspection as defined in this handbook and the written charter. (i)

Serves as principal spokesperson for the SI activities in interacting with the licensee and regional management. (ii)

Receives direction and supervision from the appropriate project branch chief. (iii)

Conduct of Special Inspection (F)

Personnel selected for an SI shall possess a high degree of technical capability, and should be selected to ensure that the inspection is conducted in a timely, professional, thorough, and coordinated manner. (1)

The procedures that guide and control the establishment and investigatory activities of an SI are included in Inspection Procedure 93812, “Special Inspection Procedure.” (2)

Followup (G)

Identification, review, and approval of licensee corrective actions, licensee actions before resumption of facility operations, and NRC enforcement actions must be accomplished through the normal organizational structure and procedures. (1)

The appropriate regional division director will initiate followup actions needed on the basis of SI findings. Generally, followup actions will be handled through normal office procedures. For example, the regional office might initiate a task interface agreement with NRR to examine a particular issue and track the issue on the region's open-item list. Specific guidance on resolution and closeout of followup actions will be provided in the NRC Inspection Manual and Inspection Procedures. (2)

Attachment 2
Review of Baseline Procedures for Evaluating Ongoing Safety Issues

1. **Procedures that are Not Applicable**

The team reviewed the following procedures and determined that the associated inspections did not intrinsically inspect areas that involved real-time reactor safety issues or degraded conditions:

- 71114 "Reactor Safety-Emergency Preparedness"
- 71121 "Occupational Radiation Safety"
- 71122 "Public Radiation Safety"
- 71130 "Physical Protection"
- 71151 "Performance Indicator Verification"
- 71111.06 "Flood Protection Measures"
- 71111.11 "Licensed Operator Requalification"
- 71111.12 "Maintenance Rule Implementation"

2. Procedures with Limited Scope

The team reviewed the following procedures and determined that the scope of the procedure was too limiting to permit real-time baseline inspection of degraded conditions or was conducted after the licensee's program completed the activity:

- 71111.01 "Adverse Weather Protection"

  This inspection procedure scope is very specific. It tells the inspector when and where to look. While it does have some in plant inspection that may identify issues, the scope was too narrow, and benefit of modifying the procedure would be minimal.

- 71111.05 "Fire Protection"

  The team determined that, while fire protection is important, the limited scope of the systems, tertiary impact to reactor safety, and ease of compensatory action make the use of this procedure in reviewing ongoing safety conditions limited.

- 71111.07 "Heat Sink Performance"

  The scope of this procedure is limited to the observation of heat exchanger performance testing. Therefore, this procedure would not be used in the real-time review of a degraded condition, unless the observed

condition is specifically a degraded heat exchanger and performance testing was conducted.

- 71111.08 “Inservice Inspection Activities”

  The scope of this procedure is limited to the review and evaluation of the licensee’s pre planned inservice inspection program. This procedure may be used to evaluate risk-significant conditions within its narrow scope without modification.

- 71111.14 “Personnel Performance During Nonroutine Plant Evolutions”

  Conditions identified within the scope of this procedure would most likely qualify as an event in accordance with Management Directive 8.3, and would be reviewed as such.

- 71111.20 “Refueling and Outage Activities”

  This procedure was used at Cooper during the initial identification of the degraded splice treatments. However, the procedure is limited to observation and evaluation of activities involved in refueling and does not lend itself well to reviewing identified degraded conditions.

- 71111.21 “Safety System Design and Performance Capability”

  This is a biennial procedure making its use in evaluating real-time risk significant conditions extremely limited. Identified risk-significant conditions that were already corrected or compensated for could be used as criteria for system selection.

- 71153 “Event Followup”

  Conditions identified within the scope of this procedure would qualify as an event in accordance with Management Directive 8.3, and would be reviewed as such.

3. **Procedures for Reviewing Degraded Reactor Equipment Conditions**

The team reviewed the following procedures and determined that they would be useful in the routine evaluation of risk-significant degraded conditions. Some of the procedure scopes were more narrow than necessary and recommendations for revision to these procedures are included:

- 71111.02 “Evaluation of Changes, Tests, or Experiments”

  The scope of this procedure is limited to the review of safety evaluations performed in accordance with 50.59. However, the review includes verification of calculations and ensuring that the licensee’s conclusions were correct. Therefore, this procedure would be useful in evaluating degraded conditions whenever the licensee’s response included an unreviewed safety question determination.

  This procedure was utilized effectively during the special inspection at Cooper to evaluate the drywell spray valve modifications performed. Additionally, splice treatment test reports were reviewed. However, the inspections conducted attempted to verify the fidelity of the licensee’s design basis with the installed configurations.

  To provide a complete inspection tool, this procedure could be revised to permit reviewing the licensee’s evaluations of existing configurations of the plant to determine if the as-found plant is consistent with the design basis.

- 71111.04 “Equipment Alignment”

  The scope of this procedure is limited to the walkdown inspection of systems. The periodic inspections are limited to the redundant system of a system taken out of service. While this procedure can be used to identify degraded conditions, the inspection scope stops once the condition is placed in the corrective action program.

  The complete walkdown portion of this procedure could have been used to perform the material condition inspections of original splices. However, the scope only permits two systems a year. The problem at Cooper was generic and across multiple systems.

  Therefore, this was not considered to be a good tool to use and that baseline inspection does not cover this aspect of the inspection. This type of inspection at Cooper was necessary, because the craft was not fully disclosing the condition of the splice treatments during early walkdowns.

- 71111.13 “Maintenance Risk Assessments and Emergent Work”

  An assessment of emergent work could routinely be used to review risk significant degraded conditions that licensee’s determine require emergent work as corrective action.

  This procedure was used during the evaluation of the Cooper degraded splice treatments. However, the scope of the procedure limits field

observations unless prior maintenance errors have been observed in the area. The maintenance errors may not have been identified without the first inspection. The procedure scope should be expanded to include the observation of failed components that may involve rework. In this manner, the inspector could assess the possibility that maintenance had caused the failure. Additionally, the inspectors determined that there were significant training problems that needed to be addressed.

The team determined that the emergent work observed at Cooper could not have been observed under the scope of this procedure. If the scope were expanded as discussed above, the procedure would have allowed limited inspection in the area. Additionally, the number of activities that would have been inspected would have dominated the scope for the year. It was the team's opinion that this would have skewed the selection process for the year.

Given the number of field problems identified, the inspection needed to observe, review, and evaluate the training provided to the craft. This was clearly outside the scope of the baseline procedures.

- 71111.15 "Operability Evaluations"

  This procedure could routinely be used to evaluate risk significant degraded conditions. However, the scope of the procedure is limited to formal operability evaluations selected from the licensee's program. The problem and identification portion of the procedure requires the inspector to determine if operability issues are being added to the corrective action program, but does not review these issues further.

  During the initial implementation of the special inspection, the licensee had not conducted a formal operability evaluation. Therefore, this procedure was out of scope.

  The team recommends that the scope of this procedure be expanded to permit inspection of degraded conditions that are not formally addressed by the licensee's operability evaluation program (i.e., a de facto operability call). This would permit inspection of many of the questions related to operability that were reviewed during the special inspection.

- 71111.16 "Operator Workarounds"

  This procedure permits inspection of operator workarounds regardless of identification and why they occurred. Significant conditions that involve operator workarounds could be further review utilizing this procedure.

Additionally, the procedure specifically permits inspectors to review items that have not been evaluated by the licensee.

- 71111.17 "Permanent Plant Modifications"

  This procedure calls for periodic review of risk-significant modifications performed on-line as they occur. This procedure would be useful for those conditions that require licensee modification to repair.

  This procedure was utilized at Cooper in reviewing and evaluating the modification to the drywell spray valves. Additionally, it could have been useful in reviewing the modification to the drywell terminal blocks. However, the procedure should be changed to permit inspection of modifications developed and implemented as corrective actions during a forced outage.

  If revised, this procedure could have been used to review the modifications made at Cooper as a result of the equipment qualification concerns. It should be noted, however, that the number of occurrences of this "as needed" procedure would have dominated the assessment for the year.

- 71111.19 "Post Maintenance Testing"

  Observation and evaluation of post maintenance testing could routinely be used to review risk significant degraded conditions that licensees determine require maintenance with a post maintenance test.

  This procedure was used during the evaluation of the Cooper degraded splice treatments. Meetings and interviews in preparation for the inspection, infield observation of continuity tests, and quality control type inspections were all within the scope of the procedure. However, the procedure calls for six postmaintenance activities per calendar quarter. Between multiple types of splices, rework of installed splices, and continuity tests, this special inspection would have used more than half of the occurrences for the year. Again, this would have skewed the selection, dominated the results, and generally been beyond the sampling philosophy of the baseline program.

- 71111.22 "Surveillance Testing"

  Observation and evaluation of testing could routinely be used to review risk significant degraded conditions that licensees determine require Technical Specification surveillance.

  While this procedure was deemed useful in reviewing other degraded conditions, this procedure was not used during the evaluation of the Cooper

degraded splice treatments. The licensee determined that the replacement of splices did not require a reperformance of surveillance tests.

- 71111.23 "Temporary Plant Modifications"

  This procedure could be used, without revision, to evaluate risk significant conditions that were the result of a temporary modification or required a temporary modification to correct.

  This procedure would be useful in reviewing other degraded conditions. However, it was not used during the evaluation of the Cooper degraded splice treatments. The splices were repaired using the like-for-like maintenance program, and all related modifications were permanent.

- 71152 "Identification and Resolution of Problems"

  The routine review procedure would be effective in the identification of degraded conditions. However, it does not lend itself to reviewing real-time issues beyond entering them into the corrective action program.

  The problem identified at Cooper was brought out by the resident inspectors and entered into the licensee's corrective action program. However, the licensee did not recognize that the issue needed to be resolved prior to restart. The procedure then requires the selection of a sample of corrective action documents that have been through the licensee's process.

  This procedure was not an effective procedure for inspecting the problems identified at Cooper. This procedure could be revised to include a selection of items currently being processed by the licensee's program. However, the team concluded that this would no longer be evaluating the licensee's corrective action process because of NRC involvement in that process. Additionally, such a procedure scope could be exploited by an inspector desiring to conduct inspection outside the baseline inspection program.