



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

June 16, 2000

Mr. J. V. Parrish (Mail Drop 1023)
Chief Executive Officer
Energy Northwest
P.O. Box 968
Richland, Washington 99352-0968

**SUBJECT: NRC'S WNP-2 TRIENNIAL FIRE PROTECTION BASELINE INSPECTION
REPORT NO. 50-397/00-07**

Dear Mr. Parrish:

On May 1 to 5, 2000, the NRC conducted a fire protection triennial baseline inspection of your WNP-2 facility. The enclosed report presents the results of this inspection. The team leader presented these findings to Mr. R. Webring, Acting Vice President, Generation, and members of your staff in an exit meeting on May 5, 2000, at the WNP-2 facility.

In this inspection, the NRC evaluated the effectiveness of activities conducted under your license as they related to implementation of your NRC-approved Fire Protection Program.

Based on the results of this inspection, the NRC has identified issues that were evaluated under the risk significance determination process as having very low safety significance (green). The NRC has also determined that violations are associated with these issues. The violations are being treated as Non-Cited Violations, consistent with Section VI.A of the Enforcement Policy. In regard to one of the violations, it is the NRC's understanding that you do not consider that you are in noncompliance with the 1974 National Fire Protection Association Code 72E as it relates to the placement of automatic fire detectors. However, based on the team's review of your licensing basis documents, we determined that you did not address the specific requirement of the 1974 National Fire Protection Code 72E as discussed in the details in Section 1R05.2.b.1 and, therefore, you did not meet the Code requirement. The Non-Cited Violations are described in the subject inspection report. If you contest the violations or severity level of the Non-Cited Violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the WNP-2 facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room and will be available on the NRC Public Electronic Reading Room (PERR) link at the NRC home page, <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RAI

Dr. Dale A. Powers, Acting Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Docket No.: 50-397
License No.: NPF-21

Enclosure:
NRC Inspection Report No.
50-397/00-07

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-397
License No.: NPF-21
Report No.: 50-397/00-07
Licensee: Energy Northwest
Facility: WNP-2
Location: Richland, Washington
Dates: May 1 to 5, 2000
Team Leader: C. E. Johnson, Senior Reactor Inspector
Engineering and Maintenance Branch
Inspector: R. Mullikin, Senior Reactor Inspector
Engineering and Maintenance Branch
Accompanying Personnel: P. Qualls, Fire Protection Engineer
Plant Systems Branch
Office of Nuclear Reactor Regulation
F. Wyant, Contractor
Sandia National Laboratories
T. Wheeler, Contractor
Sandia National Laboratories
Approved By: Dr. Dale A. Powers, Acting Chief
Engineering and Maintenance Branch
Division of Reactor Safety

ATTACHMENTS:

Attachment 1: Supplemental Information
Attachment 2: NRC's Revised Reactor Oversight Process
Attachment 3: WNP-2 Fire Protection Position Paper, dated May 4, 2000

SUMMARY OF FINDINGS

WNP-2

NRC Inspection Report No. 50-397/00-07

This report covers a 1-week onsite inspection by a team of two Region IV inspectors, one Office of Nuclear Reactor Regulation observer, and two contractors during May 1 to 5, 2000. The report includes the results of the licensee's implementation of the NRC-approved fire protection program. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609.

- **Green.** The team identified several fire areas without detectors installed, as required by the 1974 National Fire Protection Association Code 72E. Section 4-4.6 states, in part, "If beams exceed 18 inches in depth and are more than 8 feet on centers, each bay shall be treated as a separate area requiring at least one detector." The team identified that Fire Areas RC-4, RC-9, RC-14, and RC-19 did not meet the Code requirement. Operating License Condition 2.C.14 requires that the licensee implement and maintain the approved fire protection program. This approved program is committed to the 1974 National Fire Protection Association Code 72E. The failure to maintain the Code requirement for fire detector placement is a violation of Operating License Condition 2.C.14. This violation is being treated as a Non-Cited Violation (50-397/0007-01), consistent with Section VI.A of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 200-0751.

This issue was evaluated to have very low risk significance because redundant safe shutdown functions were separated by a 3-hour fire barrier (Section 1R05.2b.1).

- **Green.** The team identified one small opening in a 1-hour Darmatt fire barrier where a Whittaker cable penetrated. The fire barrier protected the Division 2 safe shutdown cables. The opening was in the shape of an isosceles triangle with the base measuring about 0.5 inches and the height measuring about 0.375 inches. This fire area (RC-3) was of high risk consequence because if a postulated cable fire occurred in this area, both divisions of post-fire safe shutdown capability would be lost.

Operating License Condition 2.C.14 requires that the licensee implement and maintain the approved fire protection program. The approved program requires that a 1-hour fire-rated barrier be maintained between redundant safe shutdown trains in this fire area. The failure to maintain a 1-hour fire-rated barrier is a violation of License Condition 2.C.14 and is being treated as a Non-Cited Violation (50-397/0007-02), consistent with Section VI.A of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 200-0736.

This issue was evaluated and was determined to be of very low risk significance because barrier degradation, detection, and automatic and manual suppression for Fire Area RC-3 were in the normal operating state (Section 1R05.2b.2).

REPORT DETAILS

Summary of Plant Status: The plant was at or near full power throughout the inspection period.

1. **REACTOR SAFETY**

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection

The purpose of this inspection was to review the WNP-2 fire protection program for selected risk-significant fire areas, with emphasis on verification that the post-fire safe shutdown capability and the fire protection features provided for ensuring that at least one post-fire safe shutdown success path is maintained free of fire damage. The inspection was performed in accordance with the new NRC regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team leader and a Region IV senior reactor analyst used the WNP-2 Individual Plant Examination External Events (IPEEE) to choose several risk-significant areas for detailed inspection and review. The fire areas chosen for review during this inspection were:

- Fire Area RC-3 (Cable Chase)
- Fire Area RC4 (Division 1 Electrical Equipment Room)
- Fire Area RC-19 (Radwaste/Control Building Corridor)
- Fire Area TG-1 (Turbine Generator Building General Equipment Corridor)
- Fire Area R-1 (Reactor Building General Equipment)

For each of these fire areas, the inspection was focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of license commitments, and changes to the fire protection program.

.1 Systems Required to Achieve And Maintain Post-Fire Safe Shutdown

a. Inspection Scope

The team reviewed the plant systems required to achieve and maintain a post-fire safe shutdown to determine if the shutdown methodology had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire area selected for review. Specifically, the review was performed to determine the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions. This team review included the fire protection safe shutdown analysis.

The team also reviewed the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, safety evaluation reports, exemptions, and deviations) to understand the licensing basis.

b. Issues and Findings

No findings were identified.

.2 Fire Protection of Safe Shutdown Capability

a. Inspection Scope

The team performed a plant walkdown of the areas selected for review. The team verified that the automatic fire detectors and automatic fire suppression system associated with the areas selected, were adequately installed. The team also reviewed the licensee's evaluations and submittals, and verified through observations that selected automatic fire detectors and automatic suppression systems were installed in accordance with the code of record and would adequately control and suppress fires associated with the hazards of each selected fire area. The team also reviewed code deviations associated with the fire areas selected for review.

b. Issues and Findings

The team found that automatic fire detection and suppression systems were installed in accordance with the code of record and would adequately control and suppress fires associated with the hazards of each selected area, with some exceptions discussed below.

The team also inspected the Darmatt 1-hour fire-rated barrier in fire areas selected. Specifically, Fire Area RC-3 (Cable Chase) to verify barrier integrity and adequate separation of redundant safe shutdown trains.

b.1 Automatic Detection

During a plant tour, the team identified that in certain fire areas (i.e., RC-4, RC-9, RC-14, and RC-19), automatic fire detectors were not installed in accordance with the 1974 National Fire Protection Association Code 72E. Section 4-4.6 of the Code states, in part, "In beam construction over 8 inches in depth, movement of heated air and smoke may be slowed by the pocket or bay formed by the beams. In this case, spacing shall be reduced. If beams exceed 18 inches in depth and are more than 8 feet on centers, each bay shall be treated as a separate area requiring at least one detector." The team identified that the beam depths were 36 inches and more than 8 feet on centers, and detectors were not installed in each bay or pocket as specified by the Code.

The licensee's staff disagreed with the finding and informed the team that the NRC had approved their overall fire protection program in an acceptance letter to Final Safety Analysis Report, Amendment 37. The licensee stated, in a written response, ". . . that the acceptance of Final Safety Analysis Report, Amendment 37, by the NRC was

received by the Supply System on November 11, 1987, and none of the items related to Code discrepancies." The licensee's staff also informed the team that a contractor had performed a walkdown of their fire areas to ensure that detection and suppression in safety-related areas were in full compliance with the Code of record. The results were documented in a contractor's walkdown report and Manual WMC-064, "Fire Protection Program Re-Evaluation."

The team reviewed the contractor's walkdown report and Manual WMC-064, and determined that the report did not address the specific concern relative to detection in beam pockets greater than 18 inches in depth. This contractor's walkdown report was included in the Final Safety Analysis Report as Attachment F, which listed the approved deviations from code as Manual WMC-064.

The team identified several possible reasons why the licensee's documentation did not address the specific aspects of the Code. The first possible reason was: (1) the licensee's staff indicated that the 1974 National Fire Protection Association Code 72E was not used in the design of the fire detection system at WNP-2, and (2) the contractor used as-built drawings that did not incorporate this design in their walkdown inspection. The team determined that the contractor's report addressed National Fire Protection Association Code deviations based upon the as-built drawings. The team concluded that the deviation regarding this issue in Attachment F did not address the specific Code requirement. The walkdown report only appeared to address the relocation of the detectors because of obstructions (i.e., cable trays; heating, ventilation and air conditioning equipment; and beams). From discussions with the licensee's staff, the team concluded that this issue of concern appeared to apply to other WNP-2 fire areas.

The licensee's fire protection personnel provided a written response (Attachment 3), dated May 4, 2000, to the team that documented the sequence of events that led to the NRC approval of their fire protection program.

The team reviewed all correspondence listed by the licensee in their response, dated May 4, 2000, and concluded that the NRC did not approve the code deviation as submitted by the licensee.

The team then evaluated the finding, which was determined to have very low risk significance because redundant safe shutdown functions were separated by a 3-hour fire-rated barrier.

Operating License Condition 2.C.14 for the facility requires that the licensee implement and maintain the approved fire protection program, as described in Section 9.5.1 and Appendix F of the FSAR. The licensee committed in Amendment No. 37 to meet the guidelines of Appendix A to Branch Technical Position Auxiliary Power Conversion System Branch 9.5-1, which was contained in Final Safety Analysis Report, Appendix F.

Branch Technical Position Chemical Engineering Branch 9.5.1, paragraph C.6.a, states, in part, that fire detector systems should, as a minimum, comply with the requirements of Class A Systems as defined in National Fire Protection Association Code 72D, "Standard for Installation, Maintenance, and Use of Proprietary Protective Signaling Systems," and selected and installed in accordance with National Fire Protection

Association Code 72E. The 1974 National Fire Protection Association Code 72E, Section 4-4.6, states, in part, "In beam construction over 8 inches in depth, movement of heated air and smoke may be slowed by the pocket or bay formed by the beams. In this case, spacing shall be reduced. If beams exceed 18 inches in depth and are more than 8 feet on centers, each bay shall be treated as a separate area requiring at least one detector."

Contrary to the above, and as stated previously, the team identified certain fire areas that did not meet the code of record for detection. The failure to maintain the minimum code of record for fire detectors was a violation of Operating License Condition 2.C.14. This violation of the Operating License Condition 2.C.14 is being treated as a Non-Cited Violation (50-397/0007-01), consistent with Section VI.A of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 200-0751.

The team used the current Manual Chapter 0610* guidance in Appendix D (Guidance for Classifying Violations as Minor Violations) and Appendix E (Thresholds for Documentation) and determined that this issue was green.

b.2 Fire Barrier

The team found that the barriers in the areas selected for review were installed according to design specifications and the manufacturer's instructions. The team found that the installed configurations were completed based on previously conducted fire testing in accordance with the guidance provided in ASTM E-119, "Standard Test Methods for Fire Tests of Building Construction and Materials." The team did not identify any deficiencies in the automatic water suppression or the fire detection system in Fire Area RC-3.

During the plant tour, the team identified one small opening where a Whittaker cable penetrated a Darmatt fire barrier. The opening was the shape of an isosceles triangle with the base measuring about 0.5 inches and the height measuring about 0.375 inches.

In response to the observation, the licensee initiated a fire tour compensatory action and initiated Problem Evaluation Request 200-0736. The licensee conducted an evaluation of the significance of the small opening in the barrier. An inspection with a boroscope showed that the nearest cable, which could be damaged by a fire was about 18 inches away from the opening. The licensee's fire protection staff determined that the small opening would not significantly reduce the integrity of the Darmatt fire barrier.

This fire area (RC-3) was of high risk consequence because if a postulated cable fire occurred in this area, both divisions (Division 1 and 2) of post-fire safe shutdown capability would be lost. The team then evaluated the finding using the NRC's Significance Determination Process. The inputs to the determination process were for fire ignition frequency (obtained from the licensee's individual plant examination of external events); normal or low degradation for the barrier (based on additional information from the licensee); and normal for both manual and automatic fire suppression in the area, with a small common mode failure component. The process yielded a finding of very low safety significance, as given below.

The following was considered in evaluating the risk for Fire Area RC-3:

- A fire ignition frequency (IF) of 7.1×10^{-4} per year was determined from the licensee's individual plant evaluation external events document.
- Degradation of the 1-hour fire-rated ceiling was determined to be normal operating state, based on additional information from the licensee (FB = -1.0).
- Although a fire brigade drill was not witnessed by the team, no adverse observations were noted by the NRC within the last 2 years; therefore, manual suppression (MS) was considered to be in its normal operating state (MS = -1.0).
- Automatic suppression was determined to be within its normal operating state (AS = -1.25).
- A common cause term (CC) of +0.25 was used, which takes into account the relationship between automatic fire suppression and manual fire fighting hose systems (CC = +0.25).
- A fire mitigation frequency (FMF) was calculated to be -6.1 using the formula, $FMF = \log IF + FB + AS + MS + CC$.
- Based on the length of time the condition existed (greater than 30 days), the likelihood for the initiating event occurrence during the degraded period was rated G.
- Remaining mitigation capability - None.
- The team leader concluded that the findings for Fire Area RC-3 (Cable Chase) were determined to be of very low safety significance.

Operating License Condition 2.C.14 for the facility requires that the licensee implement and maintain the approved fire protection program. The approved program requires that a 1-hour fire-rated barrier be maintained between redundant safe shutdown trains in this fire area. The failure to maintain a fire-rated barrier was a violation Operating License Condition 2.C.14. This violation of Operating License Condition 2.C.14 is being treated as a Non-Cited Violation (50-397/0007-02), consistent with Section VI.A of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Problem Evaluation Request 200-0736.

.3 Post-Fire Safe Shutdown Circuit Analysis

a. Inspection Scope

The team reviewed the licensee's multiple high-impedance short-to-ground analysis. The "Design Basis Fire High Impedance Fault Analysis" in document NES-7, "Design

and Safety Analysis," Revision 5, was the focus of this review. The purpose of the review was to determine the potential impact of fire-induced overloads on safe shutdown equipment power supplies through consideration of the cumulative effect of multiple ground fault currents, each below the trip threshold of its protective device (fuse or breaker), and the resulting effect on the availability of the required power buses.

The team reviewed the fuse/breaker coordination analysis for the 4.16 kV and 480 Vac switchgear boards required for post-fire safe shutdown and the vital dc buses. Upon request, plant personnel provided coordination and trip setting analysis documents and a number of time-current characteristic curves for the purpose of this review.

The team reviewed the fuse/breaker protection for non-safe shutdown electrical circuits on a sample basis. The intent of this review was to determine if nonessential circuits routed in common enclosures with safe shutdown circuits could damage the safe shutdown circuits as a result of the effects from a fire.

The team reviewed the licensee's spurious signal analysis. The intent of this review was to determine if spurious actuations could occur due to effects from a fire and compromise the functionality of the required safe shutdown systems. In addition, reviews were made of the licensee's "Hi/Lo Analysis," in document NES-7, discussing the possibilities for multiple spurious actuations potentially resulting in an unrecoverable loss-of-coolant accident, and the licensee's analysis of NRC Information Notice 92-18, discussing the susceptibility of certain motor-operated valves to potentially valve-damaging short circuits caused by fire.

b. Issues and Findings

b.1 Common Power Supply/Bus

(a) Multiple High Impedance Faults

No findings were identified.

(b) Fuse/Breaker Coordination

No findings were identified.

b.2 Common Enclosures

No findings were identified.

b.3 Spurious Signals

The team found that document NES-7, makes the following statement in the Post Fire Safe Shutdown Analysis Assumptions and Criteria (Section 5.8), "Any and all, one at a time, means that during a fire, all potential spurious actuations shall be considered to occur, but one at a time only, and not in conjunction with or concurrently with any other postulated spurious actuation(s)." Thus, although the licensee's fire protection staff appeared to indicate that they will evaluate every possible spurious actuation and its

effects on safe shutdown, the evaluation was based on a single occurrence (individually) and a mitigation strategy for each was developed separately. (NOTE: The licensee does not apply the single occurrence assumption to high/low pressure interface analyses nor to the high impedance fault analysis.)

The NRC staff position, as discussed in the enclosure to Enforcement Guidance Memorandum 98-002, "Disposition of Violations of Appendix R, Sections III.G and III.L Regarding Circuit Failures," Revision 2, regarding the industry expression "any and all, one at a time" was that every possible spurious actuation must be considered and that spurious actuations of multiple components, whose cables are exposed to the same fire, should be assumed to occur concurrently in time (not necessarily simultaneously). These multiple spurious actuations must be considered as part of a safe shutdown analysis. Additionally, the cumulative effects of such multiple spurious operations on safe shutdown capability must be evaluated.

The licensee's fire protection staff position on this matter was contrary to NRC guidance (e.g., the responses to Questions 5.3.1, "Circuit Failure Modes"; 5.3.2, "Hot Short Duration"; and 5.3.10, "Design Basis Plant Transients"; in Generic Letter 86-10). Furthermore, mitigation strategies provided for a number of single (isolated-event) spurious actuations may not be effective in maintaining safe shutdown capability were multiple (concurrent-event) spurious actuations to occur as the result of a fire.

The team found that the high/low pressure interface analysis evaluated the possibility of spurious actuation of two high-to-low pressure interface valves (in series), which would, as a consequence, expose low pressure piping and components to reactor pressure levels with subsequent failure (rupture) and potential loss of reactor vessel inventory. The high-to-low pressure interface valves selected for this review (and provided on WNP-2's safe shutdown equipment list) consisted of the following pairs of valves: RHR-V-8 and RHR-V-9, RHR-V-53A and RHR-V-123A, and RHR-V-53B and RHR-V-123B.

The team found that the licensee's evaluation of the high/low pressure interface Valve RHR-V-8 recognized that it may spuriously open due to fires in Fire Areas RC-7, RC-10, and RC-19. However, Valve RHR-V-9 was maintained in the closed position with power removed from the motor via a disconnect switch located in Fire Area RC-7. The disconnect switch was alarmed in the control room. In addition, the valve motor power cables were routed in a grounded steel conduit containing no energized conductors. The grounded steel conduit would shield Valve RHR-V-9 power cables from external hot shorts by causing the protective devices for the shorting cables to trip; thus, de-energizing the potential spurious operation power source.

In the fire areas selected during this inspection, no findings resulting from this assumption were identified.

.4 Alternative Safe Shutdown Capability

a. Inspection Scope

The team reviewed the licensee's systems required to achieve alternative safe shutdown to determine if the alternative shutdown methodology had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions. The team also focused on the adequacy of the systems to perform reactor pressure control, reactor coolant makeup, decay heat removal, process monitoring, and support system functions.

b. Issues and Findings

No findings were identified.

.5 Operational Implementation of Alternative Shutdown Capability

a. Inspection Scope

The team performed a walkdown of the actions defined in Procedure 4.12.1.1, "Control Room Evacuation and Remote Cooldown," Revision 37, which was the procedure for performing alternative shutdown from the remote shutdown panel. The team verified that operators could reasonably be expected to perform the procedures within applicable shutdown time requirements and that equipment labeling was consistent with the procedure. The team's review of the adequacy of communications and emergency lighting associated with this procedure are documented in Sections .6 and .7 of this report.

b. Issues and Findings

No findings were identified.

.6 Communications

a. Inspection Scope

The team reviewed the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties. The licensee credited portable radios for post-fire safe shutdown actions that require prompt control room operator response. The team verified that portable radios were available for emergency use by operators and fire brigade members. The team also verified the radios were maintained in a charged state, and that routine preventive maintenance was being performed to assure that the radios were being maintained in an operable condition.

b. Issues and Findings

No findings were identified.

.7 Emergency Lighting

a. Inspection Scope

The team reviewed the emergency lighting system required for safe shutdown activities in the selected fire areas to verify it would provide for adequate access to safe shutdown equipment and the ability to perform manual actions required to achieve and maintain hot shutdown conditions. The team also reviewed the adequacy of emergency lighting for performing actions required in Procedure 4.12.1.1, "Control Room Evacuation and Remote Cooldown," Revision 37, which included access and egress routes. The team also verified that routine preventive maintenance was being performed to assure that the fixed and portable 8-hour battery powered lighting were being maintained in an operable condition.

b. Issues and Findings

No findings were identified.

.8 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed equipment operations and capability to determine if any repairs were required in order to achieve cold shutdown. The team noted that the licensee did not require the repair of equipment to reach cold shutdown based on the safe shutdown methodology implemented.

b. Issues and Findings

No findings were identified.

4 OTHER ACTIVITIES

40A5 Management Meetings

.1 Exit Meeting Summary

The inspection findings were presented to Mr. R. Webring, Acting Vice President, Generation, and other members of licensee management by the team leader in an exit meeting on May 5, 2000, at the WNP-2 facility. Licensee management stated that they disagreed with the team's conclusions that the lack of automatic fire detectors in beam pockets in the inspected areas did not meet the 1974 National Fire Protection Association Code 72E based on the fact that the NRC granted and approved the deviation in a safety evaluation report dated November 11, 1987.

The team asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Brastad, Consulting Engineer
B. Brownlee, Licensing Engineer
D. Coleman, Manager, Regulatory Affairs
S. Conroy, Fire Protection Engineer
J. Dittmer, Supervisor, Electrical/Instrumentation and Controls
W. Estes, Acting Manager, Maintenance
W. Harper, Fire Protection Engineer
V. Harris, Manager, Maintenance Production
G. Hendrick, Manager, Operations
P. Ingersoll, Acting Engineering Manager
P. Inserra, Licensing Manager
C. King, Manager, Design Engineering
J. Kittler, Shift Manager
D. Kobus, Supervisor, Engineering
D. Krieg, Engineer
J. Peterson, Fire Protection System Engineer
J. Poirier, Acting Plant Manager
L. Pong, Supervisor, Performance Engineering
C. Robinson, Quality Assurance Engineer
H. Rockey, Shift Manager
W. Sawyer, Supervisor, Quality Assurance
R. Torres, Manager, Technical Services
R. Webring, Acting Vice President, Generation
D. Wyatt, Fire Protection Engineer/Fire Marshall

Others

V. Cichocki, Design Engineer, VEC-2 Design Inc.
T. Robinson, Fire Protection Engineer, ENTERGY

NRC

J. Keaton, Resident Inspector

ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

50-397/0007-01	NCV	Failure to maintain the Code requirement for fire detectors (Section 1R05.2b.1).
50-397/0007-02	NCV	Failure to maintain a 1-hour rated-fire barrier (Section 1R05.2b.2).

LIST OF DOCUMENTS REVIEWED

Procedures

<u>Number</u>	<u>Description</u>	<u>Revision</u>
5.1.1	RPV Control	14
2.4.5	Standby Service Water System	40
4.11.4.1	Fire	25
4.12.4.1	Abnormal Condition Procedures	25
4.12.1.1	Control Room Evacuation and Remote Cooldown	37
10.25.155	Emergency Lighting Inspection - Monthly	6
10.25.156	Emergency Lighting Inspection - Annual	7

Problem Evaluation Requests

<u>Number</u>	<u>Description</u>	<u>Date</u>
200-0736	Darmatt Barrier Unsealed Annular Gap	May 5, 2000
200-0737	Equipment Referenced by Procedure Not Found In Designated Location	May 2, 2000
200-0748	Errors Were Identified During the NRC Fire Protection Audit in PFSS Flow Diagrams 7 & 9, Flow Diagrams M524-1, M521-2, and NE-02-85-19 Lighting	May 4, 2000
200-0751	NRC Inspection Considers NFPA 72E Code Deviation Not Adequately Justified	May 5, 2000

Preventive Maintenance

<u>Number</u>	<u>Description</u>
00RJM4	FPSYS102 Emergency Lantern
00RVJ7	EBUW02 Annual Inspection
00RKH9	FPSYS104 Emergency Lantern
10017	Radio System
01008104	EBUW01 Monthly Inspection

Calculations

<u>Number</u>	<u>Description</u>	<u>Revision</u>
E/I 02-92-01	Fuse Coordination Study for DC Power Distribution Systems	0
E/I 02-92-01	Calc. Modification CMR-93-636	0
E/I 02-92-01	Calc. Modification CMR-93-702	0
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E/I 02-92-17	Calc. Modification 0000000279	0
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E/I-02-95-01	Appendix A	0
E/I-02-95-01	Appendix B1: Time-Current Coordination Curves	0
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Calculation Modification Records

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CMR 98-0236	December 7, 1998	0
CMR 98-0248	January 16, 1999	5
CMR 98-0262	October 29, 1998	0
CMR 98-0268	October 29, 1998	0

Fire Protection Engineering Evaluations

<u>Document</u>	<u>Description</u>	<u>Revision</u>
FPF 1.2.3, Item 2	Qualification of Darmatt KM-1 Raceway Fire Barriers	1
FPF 11.1, Item 2	Qualification of Whittaker MI Cable as a 3-hour Race-way Fire Barrier	1

Miscellaneous Documents

<u>Document</u>	<u>Description</u>	<u>Date/Revision</u>
Design and Safety Analyses NES-7	Safe Shutdown Analysis	5
Enforcement Guidance Memorandum 98-002	Disposition of Violations of Appendix R, Sections III.G and III.L Regarding Circuit Failures	2
Field Change Request 85-0528-0-09	Revision of Pump Motor Protection Relays	April 20, 2000
Fire Areas RC-3, TG-12, RC-19, RC-4, and R-1	Computerized Cable Routing Data	N/A
GE-NE-T43-00002-00-02	Generic Guidance for BWR Post Fire Safe Shutdown Analysis, "Appendix E: Multiple High Impedance Faults"	N/A
Installation Manual - Darmatt KM-1	Fire Protection Systems, Issue D	6
ME-02-92-41 (Sec. 2)	Worst-Case Thermal Analysis	4
Proceedings of the American Power Conference	H. Ovunc and P. Zavadvker, "Multiple High Impedance Fault Analysis and Resolution for Nuclear Power Facilities"	Volume 52, 1990 (346-351)
WNP-2 IPEEE, Chapter 4	Internal Fire Analysis NES-7	June, 1995
WPPSS Interoffice Memorandum	Record of Telecon - Proposed Use of Portable Lighting for Fire Protection - May 14, 1992	May 15, 1992
Ebasco Detector Walkdown Report	An Evaluation of the Fire Detection System	August 8, 1988
WMC-064	Fire Protection Program Re-Evaluation	April 1987

ATTACHMENT 2

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

Radiation Safety

- Occupational
- Public

Safeguards

- Physical Protection

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection Findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN Findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE Findings indicate issues that are of low to moderate safety significance. YELLOW Findings are issues that are of substantial safety significance. RED Findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin, but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner, which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

ATTACHMENT 3

WNP-2 FIRE PROTECTION POSITION PAPER. MAY 4, 2000

ISSUE:

JUSTIFY THE DEVIATION THAT WE HAVE LISTED IN FSAR TABLE F.2-1 FOR THE CODE DEVIATION FOR NFPA 72E-1974, SECTION 4-4.6.

LICENSE BASIS:

Current license basis is found in Appendix F, Amendment 53 approved November 1998. The Fire Protection Program is based on BTP APCSB 9.5-1, Appendix A, Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976. Section E.1 is for Fire Detection. WNP-2 conforms to NFPA 72D, "Standard for Installation, Maintenance and Use of Proprietary Protective Signaling Systems. Deviations from the requirements of NFPA 72D are identified and justified in Table F.2-1. NFPA 72E is referenced in NFPA 72D, and therefore is used as our detection system Code of Record. The deviation to Section 4-4.6 (1974 edition) is listed in the table. The discussion centers on the location and spacing of smoke detectors in the vicinity of beams and similar projections (ducts and cable trays). The obstructions and spacing were reviewed by field inspection and compared with data from EPRI Report NP-5025. The evaluations indicate that the smoke detector locations near the beam construction will not impede proper detector function.

Note: The Amendment 53 reference is incorrect. The "Reference F.7.2.u" is a mix-up. The actual reference is supposed to be "from EPRI Report NP-5025 Project 1165-2 "Cable Tray Fire Research Program".

CHRONOLOGICAL CORRESPONDENCE:

Supplement No. 4 to the Safety Evaluation Report (SSER4) was issued on December 1983. In section 9.5.1.6 (1) (page 9-5 and 9-6) there is a general discussion on the fire detection in the Plant. There is no mention in this Report about any discrepancies with the detector placement too close to structural concrete beams or the absence of detectors in some beam pockets.

In a letter to the NRC dated September 16, 1986, the Supply System outlined a plan for a comprehensive reevaluation of the WNP-2 Fire Protection Program, including applicable requirements, licensee commitments and program implementation. A progress report was submitted in January 2, 1987, with an expected completion to be in February of 1987.

The NRC conducted routine inspections of the Plant in July, August and October of 1986 (Inspection Report 50-397/86-25). The issue of detector locations being too close to beams and also detectors omitted from beam pockets was first brought to WNP-2 attention by the NRC in a Request for Additional Information (RAI) on October 20, 1986. On page 7, Item 9 the question is raised concerning large beams and beam pockets. The reference to NFPA 72E is ¶4-3.7.3 is incorrect, but the message is the same. In the letter, two specific items were

requested: a) Discuss how the remote shutdown room meets these requirements and b) Provide drawings of the plant which specify the floor area for each fire area, the location of each smoke detector, the depths and locations of all beams which extend below the ceiling, and the functions of the equipment and cables in the fire area (i.e., safe shutdown related for a fire in the control room or cable spreading room). This Unresolved Item was tracked as item 86-25-13.

The Supply System responded to this RAI on December 1, 1986 (G02-86-1049). In this letter, on page 16 of 17, the Supply System noted that we had provided a plan outlining a Fire Protection Program Re-evaluation. The re-evaluation was presently in progress and part of the re-evaluation includes a review of the fire detection system. The program also includes a review of the NFPA Codes -vs- WNP-2 commitments, and a walkdown to assure compliance. The task started the week of 11/10/86 with completion expected by 12/31/86. With completion of the Supply System review of the consultant's report, the staff will be provided a response to the above question.

EBASCO Services Inc. was hired for the detection walk down and report and was on site in November 1986. The report was submitted to the Supply System in December 1986. Revision 0 of Manual WMC-064 is the WNP-2 response to the EBASCO findings. The manual includes the text of the EBASCO findings for drawing compliance and the physical inspections, the recommendation by EBASCO, and the WNP-2 response.

The beginning of the NFPA 72E Code Review section indicates that NFPA 72E, 1974 edition was not committed to as the code of reference. There is a reference to 72E in NFPA 72D, however, 72E was not used in the design of the fire detection system at WNP-2. The 217 Contractor had a bid issue date prior to 1975, which is when the first edition of 72E became effective. In the NFPA 72E section, ¶4-4.6 is discussed. The explanation is that "Findings in EBASCO Detector Walkdown were evaluated by field walkdowns. The result of the walkdowns are that the automatic fire detector locations around the beam construction is adequate and additional detectors are not required. See reply to EBASCO Detector Walkdown report. (No action)" WNP-2 staff addressed the specific areas and detail findings. Point No. 7 indicates that there are areas without detection investigated for compliance with NFPA 72E. Among these areas is the Remote Safe Shut Down Room, and other beam pockets in the vital island area. There are no actions for relocating or adding detectors in this area. Reasons include:

- 1. The areas have return air smoke detectors*
- 2. The areas have temperature switches to provide early warning of a fire.*
- 3. The areas have little combustibles*

The report conclusions indicate that the Remote Shutdown Room has one ionization detector, one high temperature switch which alarms on FCP3 in the Control room, and a detector in the return air duct. Either of the two detectors or the temperature switch will provide an alarm if there is a fire. The safe shutdown analysis shows that this room can be lost due to a fire and not effect the ability of the plant to safely shut down. The 1974 edition of NFPA 72D did not require or recommend detectors in pockets due to beam construction. Thus an additional detector is not recommended to be installed.

The Fire Protection Program Re-Evaluation for WNP-2 was published in April 1987. This report was formally transmitted to the NRC in April 13, 1987 (G02-87-0129). The areas walked down

included the Reactor Building, the Diesel Generator, The Rad Waste and Control and the Service Water Pumphouses.

In a letter from WNP-2 to the NRC on May 27, 1987, the subject is the NRC Inspection Report 87-02. The plant staff had reviewed the report, and were providing a timely update on the issue. One of the items is on page 2, number 2.L, Unresolved Item (50-397/86-25-13) - Inadequate Fire Detection system. The WNP-2 response is that "An independent inspection by an outside consultant has confirmed that our detection system meets requirements for safety-related areas. A copy of our consultant's report has been provided to you." The consultant's recommendations were included in the Re-Evaluation.

The acceptance of FSAR Amendment 37 by the NRC was received by the Supply System on November 11, 1987. In this acceptance letter, there were 28 remaining open items. None of the items related to Code discrepancies or to the RAI listed above.

In a January 8, 1988 letter to the NRC (G02-88-256), the plant documented the status of the 8 improvement initiatives which were identified in the re-evaluation report. Item 6 was to "Document in a report justifications for deviations from NFPA Codes". This was shown complete on 11/87. The justifications for deviations are included in Manual WHC-064.

In a letter from the NRC to WNP-2 dated July 25, 1988 (GI2-88-024), the NRC acknowledged receipt of the plant fire protection system re-evaluation on April 13, 1987. Since this re-evaluation addressed the code requirements and deviations and provides justification for the each deviation, the NRC closed the unresolved item 86-25-13. However, the evaluation is still under review by the NRC and the acceptability of the detector spacing deviations will be discussed in a supplemental Safety Evaluation Report.

In a letter from the NRC to WNP-2 dated May 22, 1989 the subject was Approved Fire Protection Program at WNP-2. Item 28 of the previously mentioned 28 remaining open items is included on page 16. The Safety Evaluation for this item includes discussion on the NFPA code deviations which were identified in the EBASCO report and summarized in a letter to the NRC dated April 13, 1987 (G02-87-0129). WNP-2 also reported that the results of this review are incorporated in Manual WMC-064. This letter indicates that when WNP-2 has approval of the fire protection program, and upon receipt of comments from NRC on the EBASCO findings, that the licensee plans to incorporate Manual WMC-064 and the NFPA Code deviations into the FSAR. The letter indicates that this item is acceptably resolved.

Amendment No. 67 of the Operating License NPF-21 dated May 25, 1989 references the Safety Evaluation included in the letter from the NRC dated May 22, 1989. This indicates that the Fire Protection Program is unconditionally approved.

WNP-2 incorporated Manual WMC-064 Code Deviation into the FSAR (Appendix F) in Amendment No. 45 in July 1992. SCN 88-030 Revision 2 includes the 10CFR50.59 Review.

CONCLUSION:

There are several areas in the Plant that have beam pockets which due to the size, depth and spacing of the beams should have a smoke detector installed in accordance with NFPA 72E. There are also areas where the smoke detectors have been located too close to the side of the deep beams, and also where obstructions may occur to the smoke detectors due to duct and cable tray installation. Careful evaluation of these areas by qualified Fire Protection Engineers has been done. The results of the inspections and evaluations were compiled in Manual WMC-064 and also transmitted to the NRC in the Fire Protection Program Re-Evaluation for WNP-2 on April 13, 1987.

At this time (and since Amendment 45) WNP-2 has acceptance of the Fire Protection Program by the NRC, with full acceptance of all deviations listed in Appendix F. There are no open items relating to smoke detector installation at this time.