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February 14, 1990

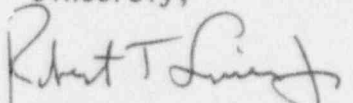
Mr. Harold Polk, Project Officer  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Contract NRC-03-87-029, Task Order 03, Review and Evaluation  
of OR Fire Protection Programs, Subtask 22

Dear Mr. Polk:

Enclosed is our final report entitled, "Technical Evaluation Report for  
the WNP-2 Fire Protection Plant Re-evaluation," Report No. SAIC-90/1029 TAC  
No. 65569. Submittal of this report completes the requirements of the Task  
Order statement of work for subtask 22.

Sincerely,

  
Robert T. Liner, Jr.  
Project Manager

Enclosures, as stated

Copy to: D. Notley  
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SAIC-90/1029

TECHNICAL EVALUATION REPORT  
FOR THE WNP-2 FIRE PROTECTION PLANT RE-EVALUATION

TAC NO. 65569

February 14, 1990



Prepared for

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Contract NRC-03-87-029  
Task Order No. 03

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## TECHNICAL EVALUATION REPORT

### WNP-2 FIRE PROTECTION PLANT RE-EVALUATION

#### 1.0 INTRODUCTION

By letter dated April 13, 1987, Washington Public Power Supply System, the licensee for WNP-2, submitted the final Fire Protection Re-Evaluation report for WNP-2. This report was prepared to address concerns raised by the NRC in their 1985 Systematic Assessment of Licensee Performance (SALP) Report and in NRC Regional Inspections performed in 1986. The Re-Evaluation incorporates four separate evaluations which were designed to address all aspects of the plant fire protection program. A comparison of the fire protection program against NRC guidance as described in BTP CMEB 9.5-1 and in commitments made by the licensee through Amendment 37 to the FSAR was prepared by Ebasco. An Assessment of the Fire Protection Program Responsibilities and Administration was conducted by the Director of Support Services and the Plant Manager. Fire protection procedures and procedural conformance was reviewed by the WNP-2 Fire Marshal. Finally, evaluation of the adequacy of the design and construction for the fire protection program during plant construction was conducted by the licensee's Manager of Generation Engineering. Although not included in this submittal, an audit was performed in 1987 by the licensee's Quality Assurance Department as required by the plant's technical specifications. References to this report and associated findings were included in the submittal.

This Technical Evaluation Report reviews the information as provided in the April 13, 1987 submittal including the aforementioned sub-reports. The adequacy of stated corrective actions intended to address identified deficiencies is also addressed.

#### 2.0 EVALUATION

In 1986, the licensee contracted with Ebasco Services, Inc. to perform a baseline comparison of the WNP-2 fire Protection Program and NRC staff guidelines. Ebasco used criteria as defined in BTP CMEB 9.5-1. Although

the plant's licensing basis is BTP APCS 9.5-1, use of CMEB 9.5-1 for review purposes is consistent with the format of the NRC Safety Evaluation. Ebasco's review excluded the safe shutdown analysis, fire brigade, administrative controls, construction adequacy and areas not containing safety related components. These items were excluded from Ebasco's scope since on-going licensee efforts to review these areas were already under way. Although the licensee was not given specific direction by the NRC on the nature of a required program evaluation, it should be noted that the areas reviewed by the licensee cannot be considered an independent review. However, an "internal" review of program issues is considered to generate beneficial information and make plant management aware of the program status and condition. An independent review of the overall fire protection program is required on a triennial basis by the plant's technical specifications. In addition, the QA audit referenced in the submittal, included the use of an independent fire protection consultant. Therefore, the method used by the licensee to perform a re-evaluation of the overall plant fire protection program is considered to be acceptable.

The Ebasco report included in the submittal concluded that no situation existed at the plant that would jeopardize the safe shutdown capability. In addition, the report concludes that WNP-2 is generally in compliance with the fire protection commitments as stated in Amendment 37 to the FSAR and with its NRC licensing commitments. The report also concludes that the plant meets the intent of applicable regulatory guidance and NFPA codes. The Ebasco report did include a number of suggested program enhancements, the majority of which consisted of clarifying program documents, including the FSAR and the Fire Hazards Analysis. The licensee states in the submittal that it recognizes that incorporation of the suggestions would be "the prudent course". Verification of these program enhancements should be included in future plant internal reviews and could be the subject of future routine NRC Regional reviews. The Ebasco report did identify several issues for which the program adequacy could not be established. These included failure to locate a flooding analysis for a fire line break, failure to locate pressure drop calculations to ensure adequate fire water and the inability to determine the adequacy of the quality assurance program without a full audit. The recommendation for the first two items was to find or re-create the appropriate analysis. These, therefore, would also be subject to future internal and NRC reviews. The report did identify procedures

intended to address the various aspects of the QA program. Since other audits and reviews are intended to ensure their adequacy, lack of a complete audit of QA adequacy is not considered a significant shortcoming of this re-evaluation effort.

The licensee's re-evaluation of program responsibilities and administrative controls led to the establishment of a WNP-2 Fire Marshal. This position which reports to the WNP-2 Operations Manager is tasked with the responsibility of ensuring the proper and effective implementation of administrative controls associated with the fire protection program. This position was given the authority to stop work if necessary when there is a failure to comply with plant fire protection procedures. Another result of this review was to strengthen the role of the Principal Fire Protection Engineer. This position is tasked with ensuring continuing compliance with fire protection design commitments and the safe shutdown analysis. The position also performs an oversight function to ensure the effectiveness of plant fire protection administrative control programs. Both the addition of a plant fire marshal and expanding the role of the fire protection engineer are considered improvements of the WNP-2 fire protection program and should help to alleviate many of the deficiencies previously identified by the NRC.

A review of the adequacy of the plant's administrative procedures was conducted. These procedures included programmatic type controls and training. The licensee concluded that all of the procedures in place were adequate with the exception of minor required changes. The licensee committed to making all the recommended changes. In addition, the review identified that while the procedures appeared adequate, enforcement of the procedures needed improvement. The modifications to the fire protection responsibilities, in addition to the increased management awareness of the fire protection program, should help to improve the enforcement of the program. Internal fire protection reviews should pay particular attention to this area in the future. In addition, compliance with plant administrative controls will continue to be included in routine NRC Regional inspections.

The licensee's submittal contained reference to a QA audit dated October 6, 1986. Although this audit report is not included in the submittal, the licensee states that none of the findings in the audit report

were significant relative to affecting the safe shutdown capability of the plant. It would be expected that all findings in the report would be tracked to their final disposition in accordance with plant Quality Assurance procedures.

Review of fire detection and suppression system installations and other fire protection design features of the plant was performed by the licensee. The licensee provided a summary of the major fire protection issues resulting from this review and a discussion of each issue.

The adequacy of thermolag fire barrier installation was reviewed. This issue was originally raised during a March 1986 NRC audit. Three separate issues were reviewed by the licensee during the re-evaluation. The first issue relates to the depth of thermolag necessary to meet the required fire rating. Based on this review, additional depth of thermolag material was needed in several areas and has been added by the licensee. The second issue pertains to the protection of conduit in a manner not substantiated with a fire test. The licensee states in the submittal that a fire test will be conducted and if necessary corrective action taken. Until the need for corrective action is established, and if necessary, implemented, the licensee has committed to treat the barrier as degraded and establish a fire watch in accordance with their technical specifications. The final issue pertains to the lack of a full 20 feet of thermolag in areas requiring this separation. Based on the licensee's review, thermolag was added to several installations for which there was less than a full 20 feet. Based on the information in the submittal, the licensee's action to correct thermolag deficiencies is acceptable.

The licensee performed a walkdown of the fire detection system to address concerns with respect to compliance with NFPA codes. The licensee was supported by fire protection engineers from Ebasco Services. The "Fire Detection System Walkdown Report" provides a list of areas where smoke detector location is stated to be "in noncompliance with paragraph 4-4.1 of NFPA 72E". The report continues to provide recommendations for each of the areas to bring them into compliance. The licensee states in the submittal that "while the detection system does not meet strict NFPA code compliance interpretation (see the Ebasco Report, Appendix I), we believe the installed detection system meets the intent of the NFPA code and will provide adequate

early warning of a fire. No change to the originally approved system is planned". NRC Generic Letter 86-10 states "When the applicant/licensee states that its design "meets the NFPA codes" or, "meets the intent of the NFPA Codes" and does not identify any deviations from such codes, NRR and the Regions expect that the design conforms to the code and the design is subject to inspection against the NFPA Codes". Although, the licensee has a report which identifies a number of areas which are in "noncompliance" with the applicable NFPA Code, the licensee concludes that the design "meets the intent of the NFPA Code". Therefore, based on guidance provided in Generic Letter 86-10, the licensee is subject to inspection against the NFPA Codes, and where a deviation is not specifically approved by the NRC the licensee could be subject to a violation.

Adequacy of the underground fire main was reviewed including the acceptability of fire main piping under buildings. The evaluation included a review of concerns related to the existence of fire main piping under the Diesel Generator Building. The licensee concluded the presence of piping under buildings does not violate the "intent of NFPA 24". Specific to the Diesel Generator Building, the licensee performed calculations which conclude that building settlement will not damage the mains below, however, the piping may be damaged in a safe shutdown earthquake. The licensee concludes that such a failure would not affect safe shutdown components. Since underground fire main piping is not required by the NRC to be seismic, the potential damage during a seismic event does not make the piping in noncompliance with NRC guidance provided that damage would not affect safe shutdown components. The licensee did conclude, based on the re-evaluation, that one of the fire mains under the Diesel Generator Building should be sleeved. This action is considered to be an attempt to improve the situation and a prudent move. Also NFPA states that "when absolutely necessary to run pipe under buildings, special precautions shall be taken which include...providing valves to isolate sections of pipe under the building". The licensee plans, based on the re-evaluation, to add five additional isolation valves for fire main piping under safety related buildings. Based on information provided in the submittal, including the stated modifications, the existence of piping under buildings is not considered to be in noncompliance with NFPA 24.



The licensee's review of the emergency lighting identified the necessity to provide additional lights in the Main Control Room, Remote Shutdown Room, Alternate Shutdown Room, SM-8 Switchgear Room and the Diesel Generator 2 Control Room. The submittal states that this lighting was determined necessary to ensure that adequate lighting levels were present. The submittal states that design direction was provided for these additions. Based on this, the licensee's action is considered acceptable.

The licensee performed an evaluation to ensure that the proper derating criteria had been applied to cables protected with thermolag. The licensee concluded that no additional derating of the cables was necessary.

Two issues were discussed in the submittal regarding the safe shutdown analysis. The finalization of a high impedance fault study was scheduled for completion shortly after this submittal. The licensee did not anticipate the need for modifications at the time of the submittal. And secondly, an issue related to removal of power from a high-low pressure interface valve was discussed. This issue is being addressed by a separate NRR review.

### 3.0 CONCLUSIONS

The effort performed by the licensee to address fire protection concerns is considered to be significant. The information provided in the April 13, 1987 submittal provides a number of corrective actions which should improve the overall fire protection program. With the exception of detection, the licensee appears to be incorporating the recommended corrective actions resulting from the various reviews. As stated in the previous section with respect to the adequacy of detection, unless previously approved by the NRC, the licensee will be subject to reviews against applicable design criteria as stated in NFPA Codes. Also, the lack of a flooding analysis and pressure drop calculations was identified. Since the recommendation was to locate or recreate these, they will be subject to future NRC review.