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ACCESSION NBR:8106020252 DOC.DATE: 81/05/26 NOTARIZED: YES DOCKET #
FACIL:STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
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STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530
AUTH.NAME AUTHOR AFFILIATION
VAN BRUNT,E.E. Arizona Public Service Co.
RECIP.NAME RECIPIENT AFFILIATION
Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards final responses of util & Bechtel Power Corp to open items of fire protection sys independent design review. Reactor coolant pumps lubrication oil sys will be discussed in fire protection evaluation rept amend.

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ARIZONA PUBLIC SERVICE COMPANY
P. O. BOX 21666 · PHOENIX, ARIZONA 85036

May 26, 1981
ANPP-18055-JMA/TFQ

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN-50-528/529/530
File: 81-056-026; 81-001-419.06; G.1.10

Dear Sir:

The final responses of Arizona Public Service Company (Attachment A) and Bechtel Power Corporation (Attachment B) to the open items of the Fire Protection System Independent Design Review for PVNGS are attached for your use. These responses have been reviewed by the Fire Protection System Review Board and were determined by the Board to sufficiently address the outstanding concerns, except for the following issues:

(1) Reactor Coolant Pumps' Lubrication Oil System

(2) Train and Channel (Cable) Separation Study

(3) Control Room Fire Criteria

Item (1) will be discussed in an upcoming PVNGS Fire Protection Evaluation Report amendment, which is scheduled to be submitted to you on June 15, 1981. Items (2) and (3) will be discussed in an upcoming PVNGS FSAR amendment, which is scheduled to be submitted to you by August 31, 1981.

Volume II of the Fire Protection System Independent Design Review, which is the revised set of figures and exhibits presented to the Fire Protection System Review Board, will be sent to you when the criteria for the Control Room Fire has been finalized.

In keeping with our prior discussions respecting the institution of this type of review, we consider it is appropriate to establish whether or not the Fire Protection System description and analysis is satisfactory to the NRC staff, or more specifically, whether the NRC staff has sufficient information and understanding to write the appropriate section of the Palo Verde Safety Evaluation Report.

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1/1

If your staff has any questions which were not dealt with satisfactorily by the Review Board or by our future submittals, we believe such questions should be raised promptly so that such subjects can be closed out completely.

Very truly yours,

E. E. Van Brunt, Jr.
APS Vice President
Nuclear Projects
ANPP Project Director

EEVBJr/TFQ:skc

Attachments

cc: J. Kerrigan (w/attachments)
G. Harrison (w/attachments)
O. Chopra (w/attachments)

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, E. E. Van Brunt, Jr., represent that I am Vice President, Nuclear Projects of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority so to do, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Edwin E. Van Brunt

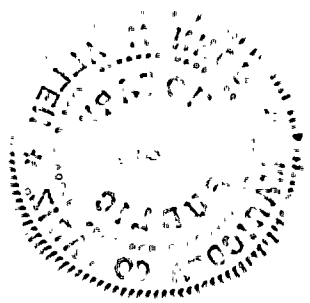
E. E. Van Brunt, Jr.

Sworn to before me this 26 day of MAY, 1981.

John M. Allen
Notary Public

My Commission Expires:

JAN 23, 1983



ATTACHMENT A

ITEM #1

Reevaluate the location and number of Class A extinguishers available at the plant.

Response

This response preempts the Bechtel response concerning Class A extinguishers in the Control Room.

Class A extinguishers (pressurized water) will be provided in the Control Room. Plant personnel who may be located in the Control Room will be instructed on the proper use of the various extinguishers which will be available in the Control Room. The Class A extinguishers will also be clearly labelled to assist the personnel in using the proper extinguisher in case of fire.

ITEM #4

Will PVNGS have a five-man fire brigade?

Response

A site fire team of at least five (5) members shall be maintained on-site at all times (composition may be less than minimum for a period of time not to exceed two (2) hours in order to accommodate unexpected absence provided immediate action is taken to fill the required positions). The fire team shall not include members of the minimum shift crew necessary for safe shutdown of the unit and any personnel required for other essential functions during a fire emergency.

Explanation

The fire team will consist of at least five (5) members, however, its composition may vary depending on the location of the fire. For example, a fire in the Unit #1 protected area would be responded to by a fire team of a different membership than a fire in the Water Reclamation Plant area, although some members may be the same.

ITEM #5

Change the PVNGS Technical Specification to meet the standard fire protection technical specification.

Response

PVNGS has reviewed the standard technical specifications for fire protection on pages 3/4 7-31 through 3/4 7-44 of CE Standard Technical Specifications (NUREG-0212, Revision 2), and will address including these specifications, as worded in NUREG-0212, Revision 2, as a part of Phase I of the PVNGS STS implementation review.

ITEM #6

Will PVNGS comply with the requirements stated in the NRC document "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance", dated June 14, 1977, concerning administrative controls (Attachment B)?

Response

PVNGS will comply with the NRC document "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance", dated June 14, 1977.

ITEM #18

Has the chemical composition of the Class B and C fire extinguishers been evaluated for possible effects that the extinguisher spray may have on stainless steel piping?

Response

The following is provided in addition to the Bechtel response:

Damage to equipment may result from the fire and perhaps to some degree from the extinguishing agent or method. This may be in the form of water damage, rust or corrosion, thermal variations (heating and cooling), residue or damage from products of combustion (smoke, acids, etc.) and corrosion or attack from dry chemical extinguishers. The investigation following any fire would include an evaluation of damage to equipment from the fire and extinguishing agents used.

ITEM #20

What criteria will the reactor operator use in determining when to shut down the reactor during a fire in the plant area?

Response

PVNGS operators will be governed by the action statements of Appendix A Technical Specifications which required plant shutdown in case of inoperability of systems or components important to safety. PVNGS design includes redundancy and train separation of systems required to bring the reactor to cold shutdown. Technical Specifications similar to Standard CE Technical Specifications provide adequate criteria for placing the plant in a safe condition in the event systems or components important to safety become inoperable, regardless of the cause for inoperability.

The time response for initiation of possible reactor shutdown due to fire damage is governed by applicable technical specification action statements and does not differ from action taken in response to other damage mechnisms. PVNGS operators will respond to indications of fire, including fire alarms by verifying the existence of the fire, initiating fire suppression measures, and by taking such actions as are required to operate the plant in a safe manner with the limits imposed by Appendix A Technical Specifications.

Explanation

The thrust of the specific items requested by the Fire Protection Review Board is that a criteria for plant shutdown, separate from and in addition to Appendix A Technical Specifications is required. PVNGS Operations strongly feels this is not the case and that limiting conditions for operations (LCO) prescribed by Appendix A Technical Specifications are sufficient, independent of the cause of safety system nonavailable. The establishment of a separate set of criteria for fire would not contribute to safety, would unduly complicate Technical Specifications increasing the chance for error, and because of the almost infinite variety of effects possible from a fire would be unworkable.

ITEM #26

The administrative control commitments, as stated in Section 4 of the presentation (Attachment C), are to be reviewed by PVNGS Operations for concurrence or justification for exception to the regulatory requirements.

Response

The administrative control commitments stated in Section 4 of the presentation are identical to Section III of the Fire Protection Evaluation Report (FPER) (Amendment 1) and, as such, have been agreed to by PVNGS Operations.

ITEM #27

If there is a fire alarm in the guardhouse, will the guard be under any obligation to advise anybody (i.e., Control Room)?

Response

Fire alarms are displayed at the Central Alarm Station (CAS) in the guardhouse. Administrative procedures will specify the response of the CAS Operator to alarms, including fire alarms. The PVNGS fire protection program will insure appropriate back-up to Central Supervisory Stations (CSS) located in Unit Control Rooms, to ensure that action is taken in the event of failure or inaccessibility of a CSS.

ITEM #31

Exhibit 4C-2 investigates the possibility of defining the guardhouse as the Central Supervising Station. If this is possible, then there is no exception to NFPA 72D-1975.

Response

PVNGS FSAR Section 9.5.1 references the report, "Fire Protection Evaluation for the Arizona Public Service Palo Verde Nuclear Generating Station Units 1, 2 and 3", May 31, 1977, as amended August, 1978 (FPE), which addresses the requirements of NRC Branch Technical Position (BTP) APCSB 9.5-1. Section 9.5.1.3.0 infers a commitment to Appendix A to BTP APCSB 9.5-1 in regard to the fire detection systems.

Position E on page 9.5.1-88 of Appendix A to BTP APCSB 9.5-1 requires that fire detection systems meet the requirements of NFPA-72D, "Standard for the Installation, Maintenance and Use of Proprietary Protection Signaling Systems" and that deviations from the requirements of NFPA-72D be identified and justified.

NFPA-72D-1975 requires:

> "1121. The Central Supervising Station shall be located in a fire-resistive, detached building or in a suitably cut-off room and, in any event, shall not be near or exposed to the hazardous parts of the premises protected."
>
> "1223. Operation and supervision shall be the primary function of the operators and no other interest or activities shall take precedence over the protective service."

PVNGS FSAR Sections 9.5.1.1.1 0 and 9.5.1.2.1 describe the safety basis for and describe the fire detection system and requires alarms to be provided in the control room, which we interpret to indicate that the Control Room is intended to be "Central Supervising Station" for purposes of NFPA-72D.

For PVNGS, the current position of FSAR Section 9.5.1 is maintained, the Unit Control Rooms are the "Central Supervising Stations", and the Control Room is suitably protected from hazardous areas of the plant and, therefore, meets the requirement of NFPA-72D-1975, Paragraph 1121.

With this arrangement, an exception to NFPA-72D-1975, Paragraph 1223, exists. The following explanation is provided:

The Central Supervisory Station will be monitored by Control Room operators who are assigned other duties in addition to monitoring this system. Control Room operators are assigned primary responsibilities for the safety of the plant which includes fire protection. It is our position that such assignment meets the intent of this paragraph to insure prompt and appropriate response to fire alarms.

'81 MAY 19 A[redacted]0

NS DOC CENTER

ATTACHMENT [redacted]

Bechtel Power Corporation

Engineers – Constructors

12400 East Imperial Highway
Norwalk, California 90650
MAIL ADDRESS
P.O. BOX 60860 - TERMINAL ANNEX, LOS ANGELES, CALIFORNIA 90060
TELEPHONE: (213) 864-6011

B/ANPP-E-73722
MOC 149298
May 18, 1981

Responsible Eng.	Action By
TFQ	(Date) 5/19/81
☐ Review & Comment	☐ Info
☐ Follow	☐ Process

Arizona Nuclear Power Project
P. O. Box 21666 - Mail Station 3003
Phoenix, Arizona 85036

Attention: Mr. Edwin E. Van Brunt, Jr.
APS Vice President, ANPP Project Director

Subject: Arizona Nuclear Power Project
Bechtel Job 10407
Resolutions of Open Items from
Fire Protection Review Board
File: N.28.02

Reference: (A) Transcript of System Review Board, February 25, 1981
(B) Letter B/ANPP-E-72139, April 14, 1981
(C) Letter ANPP-17897-JMA/TFQ, May 5, 1981

Dear Mr. Van Brunt:

In response to Reference (C), enclosed are revised resolutions of the open items addressed at the System Review Board meeting for Fire Protection held on February 25, 1981.

Very truly yours,

BECHTEL POWER CORPORATION

W. H. Wilson
Project Manager
Los Angeles Power Division

TK:pb

Enclosure: Revised Resolutions of Open Items Addressed at System Review Board Meeting (12 pages, 4 copies)

cc: F. W. Hartley
D. B. Fasnacht
J. M. Allen
A. C. Rogers
N. Helman
D. Neal
W. F. Quinn
J. Volk
N. L. Hoefert
M. Raines
J. Deitchman (Johnson & Higgins)
C. Shippey (SCE)
M. Barnoski (CE)

All w/enclosure

RESOLUTIONS OF OPEN ITEMS ADDRESSED
AT SYSTEM REVIEW BOARD MEETING

ACTION # 1

Reevaluate the location and number of Class A fire extinguishers available in the plant. (p. 215)

RESPONSE

Eleven Class A extinguishers are provided on the 140 foot level of the auxiliary building. This level has areas where Class A flammables are known to exist in significant quantities. The only other area postulated to continually contain Class A combustibles is the main control room. However, this area also contains electrical or Class C combustibles. Class A portable extinguishers cannot be used on Class C fires without electrical shock hazard to personnel. Therefore, the use of portable CO_2 extinguishers (Class C) is more appropriate for Class C fires in the main control room, and can also be used on Class A fires.

ACTION # 2

Reexamine the sprinkler and standpipe connection design for compliance to the single active failure criterion as stated in Branch Technical Position ASB 9.5-1, Item C.5.c(1). (p. 215)

RESPONSE

PVNGS meets the single failure criteria requirements of BTP ASB 9.5-1, Item C.5.c.(1) for the control, diesel and upper levels of the auxiliary building. In addition, the fire protection system piping is seismically qualified in all buildings by equivalent static analysis with the maximum OBE acceleration from the applicable response spectra. The quality "Q" portion, which is the containment penetration, was qualified by dynamic seismic analysis using response spectra techniques.

The sprinkler systems and hose reels for the auxiliary building ESF pump rooms are not supplied from individual connections to the fire water header. The ESF pump rooms are divided by safety equipment train designations using appropriate fire barriers with Train A in the west half of the building and Train B in the east half. A header supplies fire suppression water to each area of the building. This header supplies water to both the sprinklers and the hose reels such that any single passive failure in the header will disrupt flow to the suppression system in that half of the building. However, a fire in one half of the building will not affect the other train. With a separate fire water header supplying the sprinklers and hose reels along with the three hour barriers protecting each train, adequate separation is achieved between safety trains. The containment building has only one header supplying water to all its hose reels (there are no sprinklers in the containment building). One area in the turbine building, the H_2 seal oil unit, also has sprinklers and hose reels being supplied by the same header. The turbine, radwaste and fuel buildings (as well as the other buildings of the plant) are supplied backup water suppression capabilities by means of outside hydrants on the yard main.

ACTION # 3

Determine how PVNGS will meet the requirement to have water for standpipe systems available after a safe shutdown earthquake. (p. 216)

RESPONSE

This question has been withdrawn by the NRC observer because this requirement is not applicable to PVNGS. Refer to NRC letter (Attachment 1) from R. Tedesco to E. E. Van Brunt, Jr., dated April 9, 1981.

ACTION # 4

Will PVNGS have a five man fire brigade? (p. 216)

RESPONSE

Response to be provided by APS.

ACTION # 5

Change the PVNGS Technical Specifications to meet the standard fire protection technical specifications. (p. 216)

RESPONSE

Response to be provided by APS.

ACTION # 6

Will PVNGS comply with the requirements stated in the NRC document of June 1977 concerning administrative controls? (p. 216)

RESPONSE

Response to be provided by APS.

ACTION # 7

Is the computer room and the microprocessor safety-related and are they tied in with the plant fire alarm system in any way? (p. 216)

RESPONSE

The plant computer room and the plant computer are not safety-related. The computer room is protected by the fire protection system, but no controlling functions or power sources from the computer room are tied in with the plant fire alarm system. The plant computer is not tied in with the plant fire alarm system in any way.

ACTION # 8

Verify that the cerablanket has a one hour fire rating. (p. 217)

RESPONSE

Because Cerablanket has not been tested to verify its one hour fire rating, PVNGS will use Kaowool. Kaowool is a ceramic fiber blanket composed of high

temperature aluminosilicate glass fibers. A 2" thick blanket has been tested and verified to be a one hour fire protection barrier in accordance with ASTM-E-119, as referenced in C. E. Chaille and R. S. Reiman, "Ceramic Fiber Blanket Wrap for Fire Protection of Cable Trays and Conduits," American Power Conference, Volume 42, 1980, pages 508-517. Exhibit 5C-1 and Figure 5C-4 have been revised and a copy provided as Attachment 2 for inclusion in the final transcript.

ACTION # 9

Exhibit 5A-1, Criteria 1 and 2 are not acceptable to the NRC. Consider a large exposure fire in the control room to be a design basis accident in the control room fire study, and that a fire is not limited to only a panel or cabinet. Also assume the operator leaves the control room, therefore, credit for operator action in the control room cannot be taken. (p. 217)

RESPONSE

The project is having further discussions with the NRC on this subject. A response will be provided when these discussions are concluded.

ACTION # 10

Verify that the control room is the only area for which alternative shutdown capability must be provided. (p. 218)

RESPONSE

A train and channel separation study, currently in progress, will determine if there are any other areas requiring added separation or alternative (dedicated) shutdown capability.

This study is scheduled to be submitted to the board for review by July 31, 1981 and is scheduled to be submitted to the NRC in an FSAR Amendment by August 31, 1981.

ACTION # 11

In Exhibit 1, Item A.1, does Hot Shutdown conflict with 10 CFR 50 Appendix R, which may ask for equipment and instrumentation required for Hot Standby? (p. 24)

RESPONSE

10 CFR 50 Appendix R includes requirements to ensure the capability to achieve and maintain either hot shutdown or cold shutdown, as applicable. Hot standby is not addressed in Appendix R. Therefore, Exhibit 1 is in agreement with Appendix R.

ACTION # 12

In Exhibit 2A-2, Item B.6, can the fire hydrants in the yard be used to suppress a fire at the cooling tower fan motors? (p. 42)

RESPONSE

Hose houses and hydrants are located in the yard area outside of the security fencing which surrounds the power blocks. The cooling towers are also outside the security fencing. There are a total of 5 houses, each of which contains a hydrant, along with 4 individual hydrants (for a total of 9 hydrants) located in the cooling tower area. Each hose house has 300 ft. of 2-1/2 inch hose, 100 feet of 1-1/2 inch hose, and tools which are sufficient to provide water suppression to the cooling tower motors should this be necessary.

ACTION # 13

Figure 2A.1-1, is the door in the stairwell a 2-hour door or is it a (Class B) 1-1/2-hour door? (p. 44)

RESPONSE

The door in the stairwell indicated in Figure 2.A.1-1 is a Class B door. The Class B door in this location conforms to the requirements of Uniform Building Code, 1979, Part III, Chapter 5, Section 503.c.3.

ACTION # 14

Figure 2.B.2-2, if there is a pipe break between the fire water tank and the fire pumps, what actions are necessary to maintain operability of the fire suppression system? Are the valves in the fire pump house area normally open or locked-open? If they are not locked-open, how will isolation of the jockey pump be prevented? (p. 63)

RESPONSE

All suction and discharge valves in the fire pump house have electric supervisory switches and are locked open. Any position changes, including jockey pump isolation, are alarmed at the Unit 1 control room.

In the event of a line break between the fire tanks and the fire pumps, operator action from the Water Reclamation Facility is required. The fire tanks are 40 ft. deep. The fire reserve is the bottom 24 ft. of depth, with there being approximately 13,000 gal/ft. Initially, both tanks will begin to drain. This will result in one deep well pump, rated at 1400 gal/min, starting at elevation 33 ft (116,775 gal. above the reserve). In the unlikely event that the well pump fails to start, or the leak is greater than 1400 gal/min, the second well pump, also rated at 1400 gal/min, will start at elevation 30 ft. (77,850 gal. above the reserve). The combined flow through the common pipeline is approximately 2200 gal/min. The abnormal levels and operation of both well pumps are alarmed. Operator action is required to investigate and to isolate the leak from the intact parts of the system.

ACTION # 15

Exhibit 2B-2, clarify the discrepancy between the stated maximum flow of 2000 gal/min, and the required flow of 2500 gal/min for the automatic sprinklers in the turbine building. (p. 64)

RESPONSE

Exhibit 2B-2 has been revised to reflect the correct maximum flow of 2500 gal/min. and a copy provided for inclusion in the final transcript.

ACTION # 16

Exhibit 2B-19, should there be a Class A extinguisher in the Control Room due to the paper load that will be in the Control Room? (p. 74) (To be addressed in Open Item #1.)

RESPONSE

The response to this item is included in the response to Action #1.

ACTION # 17

Figure 2.B.2-8, verify that the addition of the side rail to the Unit 1 cable trays were considered in designing the sprinkler system and what effect did this addition have on the sprinkler system design? (p. 82)

RESPONSE

The sprinkler system for cable trays provides for a flow rate of 0.15 gal/min per square foot of tray surface. The addition of side rails to increase the tray depth, but not the surface, has no effect on the sprinkler system design. The design flow rate is still considered adequate for effective fire suppression. The addition of side rails does not block the water spray from the nozzles.

ACTION # 18

Has the chemical composition of the Class B and C fire extinguishers been evaluated for possible effects that the extinguisher spray may have on stainless steel piping? (p. 85)

RESPONSE

Dry chemical portable extinguishers are provided from the Ansul Company. The Arizona distributor who provides these extinguishers at PVNGS has been contacted. The extinguishing agent is mono-ammonium phosphate. This chemical forms a crust on hot surfaces. It has a corrosive potential, if the crust is not removed with solvents and water. Any powder can be vacuumed up. The Ansul Company in Wisconsin has stated that the chloride content is less than 10 parts per million, and fluoride is not detectable. The extinguishing agent is acceptable for use at PVNGS.

ACTION # 19

Exhibit 2C-12, how will the fire detectors above the spent fuel pool be maintained? (p. 96)

RESPONSE

There are no fire detectors above the spent fuel pool. However, there are five fire detectors in the area, located in the south half of the building. These detectors will require no special maintenance procedures or precautions.

ACTION # 20

What criteria will the reactor operator use in determining when to shut down the reactor during a fire in the plant area? (p. 98)

RESPONSE

Response to be provided by APS.

ACTION # 21

Exhibit 2D-2, do any of the transformers at PVNGS have PCB in the oil? (p. 109)

RESPONSE

All indoor transformers are dry type. Oil filled outdoor transformers do not have PCB in the oil.

ACTION # 22

Figure 2.D-2, provide sectional notation to show the views illustrated in the slides. (p. 108)

RESPONSE

Figure 2.D-2 has been modified to show the views illustrated by slides 7 through 10 and a copy provided for inclusion in the final transcript.

ACTION # 23

Provide the fire protection system design criteria for the main Technical Support Center, the mini-TSCs, Emergency Operations Facility, and the Main Guardhouse, to the review board for concurrence. (p. 110)

RESPONSE

The pages of the Fire Protection System Design Criteria that apply to the Technical Support Center, mini-TSCs, Emergency Operations Facility and the main guardhouse were provided as Attachment 1 to Reference B. Revised page III.FP-27 is provided as Attachment 3. In general, these buildings will have wet pipe sprinkler systems per NFPA 15, hose racks, portable extinguishers, Halon systems where applicable, and appropriate fire barriers.

ACTION # 24

Verify that some of the structural members in the turbine building are coated. (p. 116)

RESPONSE

Structural members in the turbine building have not been provided with fire protection coatings since there are no safety-related equipment located in the turbine building. Columns and ceiling girders in the adjacent battery building are coated. The turbine building is sprinklered at the 100 ft. and 140 ft. levels which will provide protection in the form of cooling for the structural steel.

ACTION # 25

Correct Exhibit 3A-3, Item E.1 to be consistant with Figure 2.B.2-5. (p. 127)

RESPONSE

Exhibits 3A-3 and 2B-9 have been modified to be consistent with Figure 2.B.2-5 and copies provided for inclusion in the final transcript.

ACTION # 26

The administrative control commitments as stated in Section 4 are to be reviewed by PVNGS Operations for concurrence or justification for exception to the regulatory requirements. (p. 154)

RESPONSE

Response to be provided by APS.

ACTION # 27

If there is a fire alarm in the guard house, will the guard be under any obligation to advise anybody? (p. 164)

RESPONSE

Response to be provided by APS.

ACTION # 28

Exhibit 4A-64, should be modified to address air tightness of penetration seals. Exhibit 4A-65 should be modified to address the allowance of wetting down of cables without electrical faulting. Exhibit 4A-67 should be modified to address portable water extinguishers in the plant computer room. Exhibit 4A-70 should be modified to address automatic fire detection in the diesel generator area. (p. 166)

RESPONSE

Exhibits 4A-64, 65, 67, 70, and 71 have been modified and copies provided for inclusion in the final transcript.

ACTION # 29

Verify that the air pressure supplied to the pre-action sprinkler pipes will not exceed the design pressure of the pipe.

RESPONSE

The design pressure of the instrument air system is 125 psig. Relief valves are provided on the compressors and air tanks to limit the maximum operating air pressure to 125 psig. The fire main pressure is 125 psig. Per NFPA 13, Chapter 1, paragraph 11.3.1 code requirements, the sprinkler piping is hydro-tested at main pressure plus 50 psig or 200 psig, whichever is greater. Thus, the air pressure cannot exceed the pipe pressure rating.

ACTION # 30

Exhibit 4C-1, clarify the footnote concerning ANI jurisdiction. (p. 188)

RESPONSE

Exhibit 4C-1 has been modified to clarify the footnote and a copy provided for inclusion in the final transcript.

ACTION # 31

Exhibit 4C-2, investigate the possibility of defining the guardhouse as the central supervising station. If this is possible, then there is no exception to NFPA 72D-1975. (p. 189)

RESPONSE

Response to be provided by APS.

ACTION # 32

Exhibit 4C-2, should be modified to show the essential lighting panels are non-IE. (p. 186)

RESPONSE

Exhibit 4C-2 has been modified and a copy provided for inclusion in the final transcript.

ACTION # 33

Exhibits 4A-9 and 4A-10, review the response for adequacy to meet the regulatory requirements and for accuracy in describing the present design. (p.211) (To be addressed in Open Item #2.)

RESPONSE

The response to this item is included in the response to Action #2.

'81 APR 21 P1 :07

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

APR 9 1981

Responsible Eng.	Action By (Date)
WFQ	4/22/81
☐ Review & Comment	☐ Info
☐ Follow	☐ Process

Docket Nos.: STN 50-528/530

Mr. E. E. Van Brunt, Jr.
Vice President - Nuclear Projects
Arizona Public Service Company
P. O. Box 21666
Phoenix, Arizona 85036

Dear Mr. Van Brunt:

SUBJECT: SEISMIC QUALIFICATION OF STANDPIPE SYSTEM

We recently received a transcript of the Independent Design Review meeting held on February 25, 1981 to discuss the Palo Verde Fire Protection System. In reviewing this transcript, we noted that some misinformation was inadvertently given to the Board on the Palo Verde standpipe system. During the meeting, an NRC observer stated that the Palo Verde standpipe system is required to be seismically designed. This is not correct. Seismically qualified standpipe systems are required only for facilities which received a construction permit after July 1, 1976 or for facilities which are located in seismically active regions.

If you have any questions on this matter, please contact us.

Sincerely,

Robert L. Tedesco, Assistant Director
for Licensing
Division of Licensing

cc: See next page

Attachment 1

1. FIRE PROTECTION SYSTEM

1.1 PRINCIPAL FUNCTION

The fire protection system shall provide for the rapid containment and/or extinguishing of fires throughout the power plant, ancillary buildings and the water reclamation plant (WRP). It shall be based upon evaluation of potential fire hazards throughout the plant and shall both minimize the probability and consequences of postulated design basis fires affecting the ability to perform safety shutdown functions and minimize radioactive releases to the environment.

1.2 CODES AND STANDARDS

Design guidance for the fire protection system is provided as follows:

A. All System Components

- Nuclear Energy Liability and Property Insurance Association (NELPIA), Basic Fire Protection for Nuclear Power Plants, March 1970
- National Fire Protection Association (NFPA), National Fire Codes, 1975
- Occupational Safety and Health Administration (OSHA), Code of Federal Regulations Federal Register, Volume 37, Number 202, Oct. 18, 1972
- Underwriters Laboratories (UL)
- Factory Mutual (FM)
- IEEE-383
- ASTM E-84
- NFPA No. 241, Building Construction and Demolition Operations
- 10 CFR 50, Appendix R

B. Pumps

- NFPA Standard No. 20, Standard for the Installation of Centrifugal Fire Pumps
- Hydraulic Institute (HI) Standards

C. Piping and Valves

- American National Standards Institute (ANSI), B31.1, Power Piping
- ASME, Nuclear Power Plant Components, Section III, Class 2 and Section XI, for containment penetration and isolation valves
- ANSI A21.4, Cement Mortar Lining for Cast-Iron Pipe and Fittings for Water
- ANSI A21.10, Cast-Iron Fittings, 2 in. through 48 in., for Water and Other Liquids
- ANSI A21.11, Rubber Gasket Joints for Cast-Iron Pressure Pipe and Fittings
- ANSI A21.51, Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
- AWWA

). Water Sprinkler and Hose Standpipe Systems

- NFPA No. 13, Standard for the Installation of Sprinkler Systems
- NFPA No. 14, Standpipe and Hose System
- NFPA No. 15, Standard for Water Spray Fixed Systems
- ANSI B16.1, Cast Iron Pipe Flanges and Flanged Fittings
- American Society for Testing and Materials (ASTM), A-53, Welded and Seamless Steel Pipe
- ASTM A-120, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses
- ASTM A-153, Zinc Coating Hot-Dip on Iron and Steel Hardware

Tanks

- NFPA No. 22, Standard for Water Tanks for Private Fire Protection

Hydrants

- NFPA No. 24, Standard for Outside Protection

Fixed Carbon Dioxide Systems

- NFPA No. 12, Standard on Carbon Dioxide Extinguishing Systems

H. Halon 1301 System

- NFPA No. 12A, Standard on Halogenated Fire Extinguishing Agent Systems, Halon 1301

I. Portable Fire Extinguishers

- NFPA No. 10, Standard for Portable Fire Extinguishers

J. Fire and Smoke Detection Systems

- NFPA No. 70, National Electrical Code
- NFPA No. 72D, Proprietary Protective Signaling Systems
- NFPA No. 72E, Automatic Fire Detectors

K. Administrative Procedures, Controls and Fire Brigade

- NFPA No. 4, Organization for Fire Services
- NFPA No. 4A, Fire Department Organization
- NFPA No. 6, Industrial Fire Loss Prevention
- NFPA No. 7, Fire Emergencies Management
- NFPA No. 8, Management Responsibility for Effects of Fire on Operations
- NFPA No. 27, Private Fire Brigades

L. Fire Barriers

- NFPA 251, Fire Tests of Building Construction and Materials
- NFPA 252, Fire Tests of Door Assemblies
- NFPA 255, Test of Surface Burning Characteristics of Building Materials
- Underwriters Laboratories Fire Resistance Directory

1.3 DESIGN CRITERIA

1.3.1 GENERAL CRITERIA

A. The specific types of fire protection shall be selected for each area or equipment based on the type, class, and intensity of fires

including the fire hazard possibility for that individual area and/or equipment.

B. Fire protection system components shall be designed so that their failure due to seismic loading or inadvertent operation does not cause a loss of function of plant structures, systems, or components important to safety.

C. Fire protection system equipment, where applicable, shall be listed by UL and/or approved by FM and shall conform to standards of the NFPA. All equipment will be designated as quality class S.

D. Fire protection system equipment shall be installed and tested to conform to standards of the NFPA. Installation and test procedures shall be in accordance with quality class R.

E. Drawings, calculations, and final installation are subject to approval of the insurance carrier.

F. Final inspection and tests of completed installations shall be made in the presence of the insurance carrier.

G. Fire seals of compatible rating shall be provided at all penetrations through fire barriers.

H. The containment penetration piping and valves shall be Seismic Category I, Quality Assurance Class Q, Safety Class 2. The penetration assembly shall meet NRC General Design Criteria 4, 54, and 56.

~~1.3.1.1 Fire Protection of Safe Shutdown Capability~~

~~A. Fire protection features shall be provided for structures, systems, and components important to safe shutdown. These features shall be capable of limiting fire damage so that:~~

~~1. One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage; and~~

~~2. Systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) can be repaired within 72 hours.~~

~~B. Except as provided for in paragraph C below, where cables or equipment (including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, or redundant trains of systems necessary to achieve and maintain hot shutdown conditions) are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:~~

~~1. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such~~

~~• Thermal detectors shall be provided.~~

- System actuation audible and visual alarm shall be provided locally and in the control room.
- Outside hydrants shall be provided as a backup suppression system.
- Standpipe and hose system shall be installed to reach all equipment with at least one hose stream as a backup fire suppression system.

1.3.7.12 Main Guardhouse

- Hydraulically designed wet pipe sprinkler system shall be installed in the main guardhouse.
- System actuation audible and visual alarm shall be provided locally and in the control room.
- Standpipe and hose system shall be installed as a backup suppression system.

1.3.7.13 Technical Support Center

- Hydraulically designed wet pipe sprinkler system shall be installed in the Technical Support Center.
- System actuation audible alarm and annunciation shall be provided in the control room.
- Standpipe and hose system shall be installed as a backup suppression system.

1.3.7.14 Emergency Operations Facility and Administration Annex

- Hydraulically designed wet pipe sprinkler system shall be installed in the Emergency Operations Facility and Administration Annex.
- System actuation audible and visual alarm shall be provided locally and in the control room.
- Standpipe and hose system shall be provided for a backup suppression system.

- ~~Hazard area shall be isolated prior to Halon 1301 discharge.~~
- Twenty seconds predischarge delay shall be provided.
- Standpipe and hose system shall be installed to reach all areas with at least one hose stream as a backup suppression system.
- All doors shall be electrically supervised and equipped with automatic electromagnetic fire door holders.

D. Water Reclamation Plant

1. Control Room, Computer Room, and Storage Vault

- Total flooding automatic Halon 1301 system shall be provided.
- Minimum required Halon 1301 concentration should be 5 percent.
- System actuation shall be automatic or manual.
- Cross zone detection system shall be provided.
- System actuation audible and visual alarm shall be provided locally and in the main control room as well as the control room of water reclamation plant.
- Hazard area shall be isolated prior to Halon 1301 discharge.
- Twenty seconds predischarge delay shall be provided.
- Standpipe and hose system shall be installed to reach all areas with at least one hose stream as a backup suppression system.
- All doors shall be electrically supervised and equipped ~~with automatic electromagnetic fire door holders.~~

E. Main Guardhouse

1. Computer Room

- Total flooding automatic Halon 1301 system shall be provided.

- Minimum required Halon 1301 concentration should be 5 percent.
- System actuation shall be automatic or manual.
- System actuation audible and visual alarm shall be provided locally and in the control room.
- Hazard area shall be isolated prior to Halon 1301 release.
- Twenty seconds predischarge delay shall be provided.
- Standpipe and hose system shall be installed to reach all areas with at least one hose stream as a backup suppression system.
- Cross-zoned ionization shall be provided for actuation. Thermal detectors, not cross-zoned, shall also be provided for actuation.
- All doors shall be electrically supervised and equipped with automatic electromagnetic fire door holders.

F. Technical Support Center

1. Computer Room, Record Vault, and Data Display Room

- Total flooding automatic Halon 1301 system shall be provided.
- Minimum required Halon 1301 concentration should be 5 percent.
- System actuation shall be automatic or manual.
- System actuation audible and visual alarm shall be provided locally and in the control room.
- Hazard area shall be isolated prior to Halon 1301 release.
- Twenty seconds predischarge delay shall be provided.
- Standpipe and hose system shall be installed to reach all areas with at least one hose stream as a backup suppression system.
- All doors shall be electrically supervised and equipped with automatic electromagnetic fire door holders.

G. Administration Annex and Emergency Operations Facility

1. Computer Room and Storage Vault

- Total flooding automatic Halon 1301 system shall be provided.
- Minimum required Halon 1301 concentration should be 5 percent.
- System actuation shall be automatic or manual.
- Cross zone detection system shall be provided.
- System actuation audible and visual alarm shall be provided locally and in the control room as well as the control room of the water reclamation plant.
- Hazard area shall be isolated prior to Halon 1301 discharge.
- Twenty seconds predischarge delay shall be provided.
- Standpipe and hose system shall be installed to reach all areas with at least one hose stream as a backup suppression system.
- All doors shall be electrically supervised and equipped with automatic electromagnetic fire door holders.

1.3.10 FIRE DETECTION SYSTEMS (Refer to Design Criteria QK)

1.3.10.1 General

A. Fire detection system should be provided for all areas that contain or present potential fire exposure to safety-related equipment.

B. Fire detection systems shall have four wire circuit from initiating devices to the control panel and be capable of operation in the event of single-open or single-ground, ~~or wire-to-wire short.~~

C. Fire detectors should be selected and installed in accordance with NFPA 72E.

D. Fire detection system should give audible and visual alarm and annunciation in the control room.

E. Fire detection and actuation should be connected to the essential lighting power supply.

Attachment 3

- ~~Cable Trays Area~~

- 100 Ft Level
  - Steam Generator
  - Reactor Coolant Pumps
  - Cable Trays Area
- 120 Ft Level
  - Cable Trays Area
- 140 Ft Level
  - Charcoal Filter Area
  - Cable Trays Area

G. Main Steam Support Structure

- 81 Ft Level
  - Turbine Driven Auxiliary Feedwater Pump - Class B, C extinguishers
  - Motor Driven Auxiliary Feedwater Pump Room - Class B, C extinguishers
- 100 Ft Level
  - Valve Area - Class B, C extinguishers

H. Compartment Between Auxiliary and Control Building

- Class B, C extinguishers

I. Service Building

- Class B, C extinguishers
- ~~Class A, B, C extinguishers~~

J. Administration Building, Main Guardhouse, Administration Annex, Emergency Operations Facility, Technical Support Center

- Class B, C extinguishers
- Class A, B, C extinguishers

- Class A extinguishers

~~K. Water Reclamation Plant~~

L. Turbine Building

- 100 Ft Level - Class B, C extinguishers
- 140 Ft Level - Class B, C extinguishers

1.3.12 VENTILATION

A. Smoke and corrosive gases should be discharged outside to a safe location.

B. Fresh air supply intakes to areas containing safety-related equipment or systems should be located away from the exhaust air outlets.

C. Power supply and controls for mechanical ventilation systems should be run outside the fire area served by the system.

D. Stairwells should be designed to minimize smoke infiltration during a fire.

E. Stairwells, elevators and chutes should be enclosed in masonry towers with minimum fire rating of two-hours and automatic fire doors of equal rating, in the safety related areas.

F. Smoke and heat vents should be provided in the Diesel Generator Building and Turbine Building.

G. Ventilation system for the Containment Building, Auxiliary Building, Fuel Building and Radwaste Building should be continuously monitored for radioactivity.

H. Provide smoke and heat vents on a ratio of 1 square foot of ventilating area to each 100 square feet of floor area for the Turbine Building and 1 to 200 for all other buildings. This may be accomplished by approved automatic smoke and heat vents, continuous plain glass windows at eave line, or power venting with properly protected electrical arrangement. A combination of these methods is acceptable.

I. Ventilation system for the Control Building should be designed for venting through a common smoke exhaust system. Ventilation shall be sized for 250 ft^3/min per 100 square feet.

J. The Turbine Building should be continuously vented by exhaust fans ~~sized in excess of 300 ft^3/min per 200 square feet of floor area.~~

~~System Identity and Designation~~	~~Type of Interface~~
Fuel building (ZF)	Receives fire protection
Diesel Generator Building (ZG)	Receives fire protection
Control building (ZJ)	Receives fire protection
Main steam support structure (ZM)	Receives fire protection
Radwaste building (ZR)	Receives fire protection
Turbine building and pedestal (ZT)	Receives fire protection
Outside area (ZY)	Receives fire protection
WRF operations building (CB)	Receives fire protection
~~WRP fuel system (FG)~~	~~Receives fire protection~~
Plant security system (SK)	Receives alarm signals and provides alarms to operators in both the control room and the guard house by CRT display