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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
TEDESCO,R.L. Assistant Director for Licensing.

SUBJECT: Forwards marked-up responses to NRC 810909 questions re radiation protection open items. Two oversize drawings encl. Aperture cards will be available in PDR.

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	LIC BR #3 LA		1	0	KERRIGAN,J.	04	1	1
INTERNAL:	ACCID EVAL BR	26	1	1	AUX SYS BR	27	1	1
	CHEM ENG BR	11	1	1	CONT SYS BR	09	1	1
	CORE PERF BR	10	1	1	EFF TR SYS BR	12	1	1
	EQUIP QUAL BR	13	3	3	GEOSCIENCES	28	2	2
	HUM FACT ENG	40	1	1	HYD/GEO BR	30	2	2
	I&C SYS BR	15	1	1	I&E	06	3	3
	IE/EPDB	35	1	1	IE/EPLB	36	3	3
	LIC GUID BR	33	1	1	LIC QUAL BR	32	1	1
	MATL ENG BR	17	1	1	MECH ENG BR	18	1	1
	MPA		1	0	OELD		1	0
	OP LIC BR	34	1	1	POWER SYS BR	19	1	1
	PROC/TST REV	20	1	1	QA BR	21	1	1
	RAD ASSESS BR	22	1	1	REAC SYS BR	23	1	1
	REG FILE	01	1	1	SIT ANAL BR	24	1	1
	STRUCT ENG BR	25	1	1				
EXTERNAL:	ACRS	41	16	16	FEMA-REP DIV	39	1	1
	LPDR	03	1	1	NRC PDR	02	1	1
	NSIC	05	1	1	NTIS		1	1

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ARIZONA PUBLIC SERVICE COMPANY

STA. _____ P.O. BOX 21666 - PHOENIX, ARIZONA 85036

September 21, 1981
ANPP-18960-JMA/KWG

Mr. R. L. Tedesco
Assistant Director for Licensing
Division of Licensing
Office 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, G.1.10

Reference: Letter From R. L. Tedesco to E. E. Van Brunt, Jr., Dated September 9, 1981; Subject: Comments on Responses to Radiation Protection Open Items.

Dear Mr. Tedesco:

Please find attached a copy of our responses to the questions on radiation protection in the referenced letter.

If you have any questions, please contact me or my staff.

Very truly yours,

E. E. Van Brunt

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

EEVBJr/KWG/bj

Attachment

cc: J. Kerrigan (w/a)
P. Hourihan (w/a)
A. C. Gehr (w/a)

Bool
5
1/1

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin 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, Jr.

Sworn to before me this 25th day of September, 1981.

Connie Lou Armstrong
Notary Public

My Commission expires:

June 24, 1983

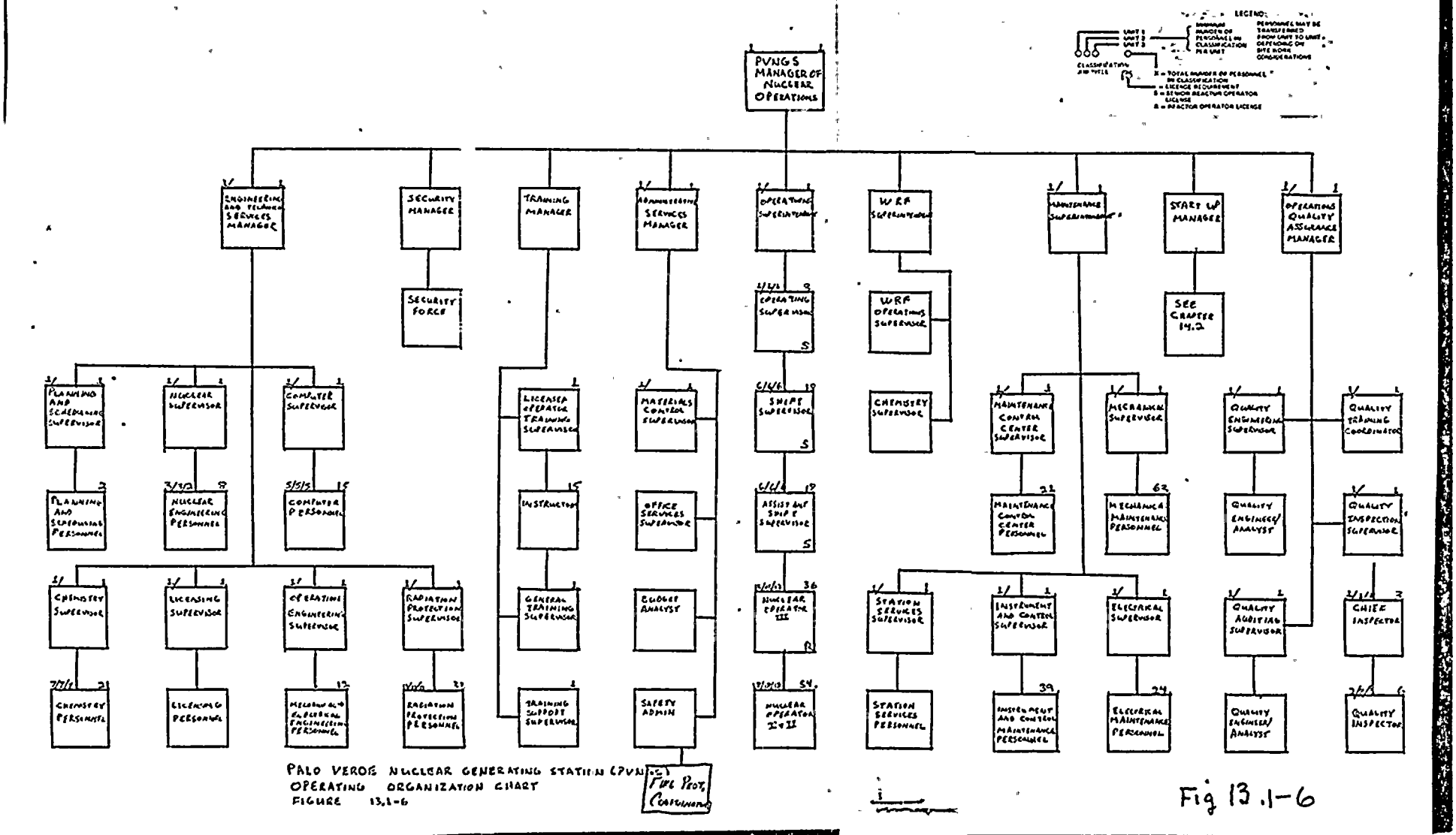
NRC QUESTION 471.6

Figures 13.1-6 and 7 should be revised to show that radiation protection section is a separate organization.

PVNGS RESPONSE

See revised PVNGS FSAR figures 13.1-6 and 13.1-7, Attachment A.

Attachment A



PALO VERDE NUCLEAR GENERATING STATION (PVNGS)
OPERATING ORGANIZATION CHART
FIGURE 13.1-6

Fig 13.1-6

Attachment A

POSITION	PRESENT NUMBER OF EMPLOYEES*	YEAR AND QUARTER: 1979 1	1979 2	1979 3	1979 4	1980 1	1980 2	1980 3	1980 4	1981 1	1981 2	1981 3	1981 4	1982 1	1982 2	1982 3	1982 4	1983 1	1983 2	1983 3	1983 4	1984 1	1984 2	1984 3	1984 4	1985 1	1985 2	1985 3	1985 4	MINIMUM NUMBER OF EMPLOYEES
PLANT MANAGER OF NUCLEAR OPERATIONS	1																													1
ASSISTANT PLANT MANAGER	+																													+
ENGINEERING AND TECHNICAL SERVICES MANAGER SUPERINTENDENT	1																													1
NUCLEAR SUPERVISOR	1																													1
NUCLEAR ENGINEERING PERSONNEL	+ 4						+								2					1			1							+ 8
RADIOLOGICAL AND CHEMISTRY SUPERVISOR	+																													+
RADIATION PROTECTION SUPERVISOR	1																													1
RADIATION PROTECTION PERSONNEL	+ 12											2		+			12	6	1			6				+				+ 33
CHEMISTRY SUPERVISOR	1																													1
CHEMISTRY PERSONNEL	7									2	6	+				+							6	+	1					+ 21
OPERATIONS ENGINEERING SUPERVISOR	1																													1
OPERATIONS ENGINEERING PERSONNEL	+ 10												1				1								+					+ 12
COMPUTER SUPERVISOR	1																													1
COMPUTER PERSONNEL	+ 8										2	3	1		1		+								+					+ 15
OPERATIONS SUPERINTENDENT	1						1																							1
OPERATING SUPERVISOR	+ 2								+					1		+														3
SHIFT SUPERVISOR SHIFT SUPERVISOR	+ 9								+				3		6	+														+ 18
SHIFT FOREMAN ASSISTANT SHIFT SUPERVISOR	+ 12								+							+	6													+ 18
NUCLEAR CONTROL OPERATOR III	+ 8								+			16				+	12													+ 36
NUCLEAR AUXILIARY OPERATOR I+II	30									10				10	12					12		10								54
MAINTENANCE SUPERINTENDENT	1																													1
MECHANICAL SUPERVISOR	1									+																				1
MECHANICAL MAINTENANCE PERSONNEL	17											10		7	1	10	4	8	1		1		5	12	5	1				63
ELECTRICAL SUPERVISOR	1																													1
ELECTRICAL MAINTENANCE PERSONNEL	14								+					3		+	2			2				+			1			+ 24
INSTRUMENTATION AND CONTROL SUPERVISOR	1																													1
INSTRUMENTATION AND CONTROL PERSONNEL	+ 23								+		+			10	5	1				9										+ 39
STATION SERVICES SUPERVISOR	1																													1
SCHEDULING AND LICENSING SUPERVISOR	1																													1
SCHEDULERS AND TECHNICAL ENGINEERS	2						1																							3
OPERATIONS QUALITY SUPERVISOR MANAGER	1																													1
QUALITY PERSONNEL	+ 8										+	1			2	3							3				1			+ 15
SUPPORT SERVICES MANAGER	+																													+
TRAINING DIRECTOR MANAGER	1																													1
INSTRUCTORS TRAINING SUPERVISOR	39						+			+		5							1											15
SIMULATOR PERSONNEL	+																													+
SECURITY DIRECTOR MANAGER	1																													1

UNIT 1 FUEL LOAD | UNIT 2 | UNIT 3

Palo Verde Nuclear Generating Station
FSAR

MANNING SCHEDULE

Figure 13.1-7

NRC QUESTION 471.2

Section 13.1.3.1 does not specify the minimum requirements for the supervising radiation physicist (who is the RPM backup). Section 13.1.2.2.2.2 specified the minimum requirements.

PVNGS RESPONSE

See revised PVNGS FSAR page 13.1-24 presenting the requested information, Attachment B.

c. The Operating Supervisor shall have a minimum of 6 years experience, of which a minimum of 2 years shall be nuclear power experience.

13.1.3.2 Qualifications of Plant Personnel

Resumes of the initial appointees to key plant managerial and supervisory positions through the Shift Supervisor level are included in appendix 13B.

d. The Supervising Radiation Physicst shall have a minimum of five years of experience, of which two years shall be at a Professional Level.

NRC QUESTION 471.3a

NUREG 0737, Sec. II.B.2 does not state that: "personnel radiation exposures in vital areas, during post-accident activities will meet the criteria of NUREG 0737 and GDC-19 design basis".

PVNGS RESPONSE

See revised PVNGS LLIR, page II.B.2, providing the requested information, Attachment C.

PVNGS Evaluation

As part of the PVNGS design process before the incident at TMI-2, the shielding of areas that require personnel access for accident mitigation (such as the control room) was reviewed to determine that access would not be unduly limited. For maintenance actions, this review principally considered shielding separation between redundant ESF components to ensure that repairs to a failed component would not be unduly restricted by radiation from an operating component. In addition, as noted in FSAR Section 3.11, safety related equipment is qualified for the maximum expected radiation dose.

An analysis of the PVNGS shielding design was performed to determine if TMI level source strengths would inhibit maintenance access or violate 10 CFR 50, Appendix A, General Design Criterion 19 (GDC 19). The analysis reviewed ~~will also review~~ equipment qualification dose limits in accordance with Commission Order and Memorandum CLI-80-21 and NUREG 0588.

INSERT A

A. Source Terms

Initial core releases used in the analyses are equivalent to those recommended in Regulatory Guides 1.4 and 1.7 and Standard Review Plan 15.6.5 and considered two LOCA events. The first was a LOCA with recirculation accomplished via the containment sump. The second was a LOCA with an intact primary with recirculation accomplished via the shutdown

Attachment A

INSERT A to II.B.2-2

The review demonstrated that personnel radiation exposures in vital areas during post-accident activities will meet the criteria of NUREG 0737 and GDC-19 design basis.

NRC QUESTION 471.3 (b)

NUREG-0737, Item II.F.1.3 - The location of the containment high-range monitors should be specified.

PVNGS RESPONSE

Locations of these monitors are provided on Attachments D and E. The containment area high range monitors are numbered RE148 and RE149.

Attachment D

RE-17 / RE148

PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2 & 3
DRAWING CHANGE NOTICE (DCN)
JOB NO. 10407

UNIT	ASSIGNEE *		
A	C	S	O
①	C	(S)	O
②	(C)	S	O
③	(C)	S	O

CIRCLE APPLICABLE UNIT(S) AND ASSIGNEE
*C - CONSTRUCTION, S - STARTUP, O - OWNER

DRAWING NO.	SHEET NO.	REV.	DCN NO.
13-J-ZCF-013		1	3

JOB NO. 10407 PAGE 1 OF 2

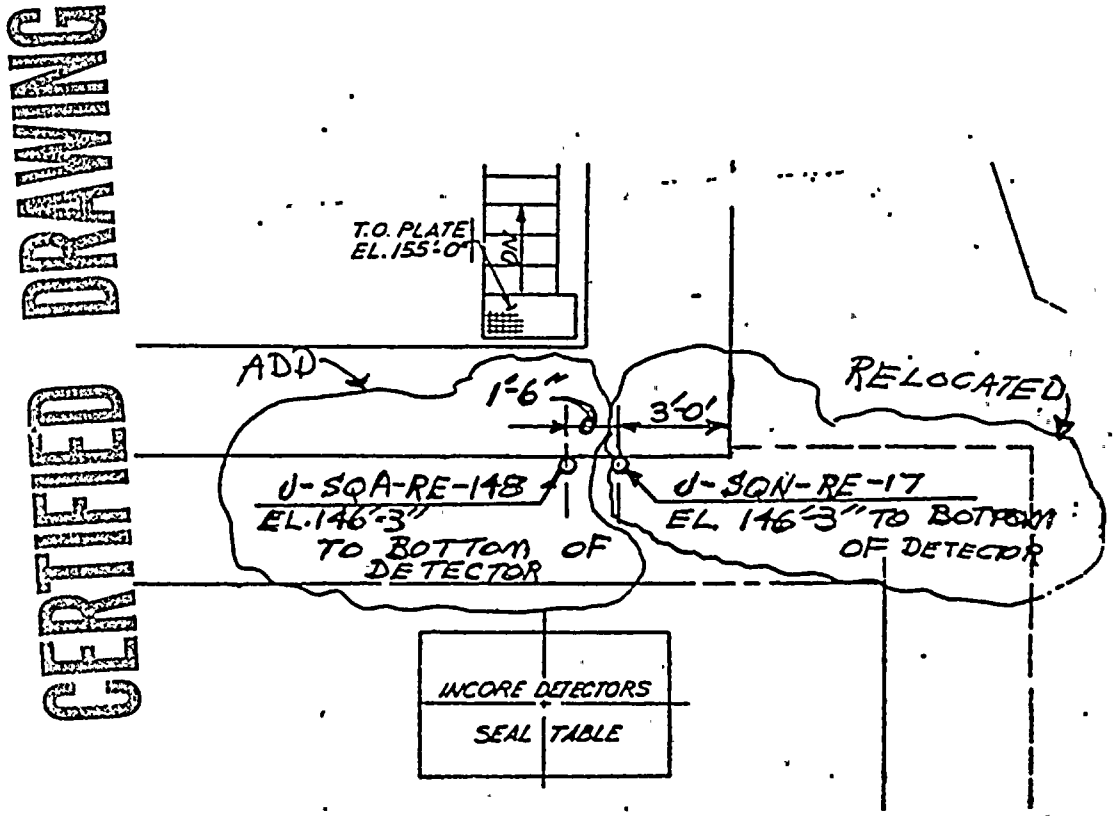
DATE: 8/11/81 BY: J.L. HUNT-CONTR.

CHANGE REQUESTED BY: ☐ CLIENT ☒ ENGINEERING ☐ FIELD ☐ SUPPLIER/CONTRACTOR

REASON FOR CHANGE: ADDITIONAL RADIATION DETECTOR REQUIRED BY NU REG 1.97 & RELOCATED DETECTOR TO CORRECT VIEWING FIELD.

DESCRIPTION OF CHANGE

ADD RE-148 & RELOCATE RE-17 AS SHOWN.



8-18-81

MATERIAL PROCUREMENT RESPONSIBILITY	AFFECTED PURCHASE ORDERS	PM OR MR PREPARED FOR DCN CHANGE YES	NO
☒ BECHTEL OFFICE ☐ SUPPLIER/CONTRACTOR ☐ BECHTEL FIELD ☐ NONE REQUIRED	NM-997	✓	

a/r K. Stevropoulos	8-11-81	gra J Frazier	8/14/81
GROUP SUPERVISOR	DATE	NUCLEAR GROUP SUPERVISOR (IF REQUIRED)	DATE
S. Alley	8/11/81	N/A	
PROJECT ENGINEER	DATE	PQAE (Q-LISTED P&ID'S AND SINGLE LINE DWGS)	DATE

REMARKS TMI TASK #10

ADDITIONAL DISTRIBUTION: ☐ PROJECT PROCUREMENT MANAGER ☐ COST TREND ENGINEER

Attachment E

PALO VERDE
NUCLEAR GENERATING STATION
UNITS 1, 2 & 3
DRAWING CHANGE NOTICE
(DCN)

CONTINUATION PAGE

DCN NUMBER			
DRAWING NO.	SHEET NO.	REV.	DCN NO.
13-J-ZCF-014		0	2

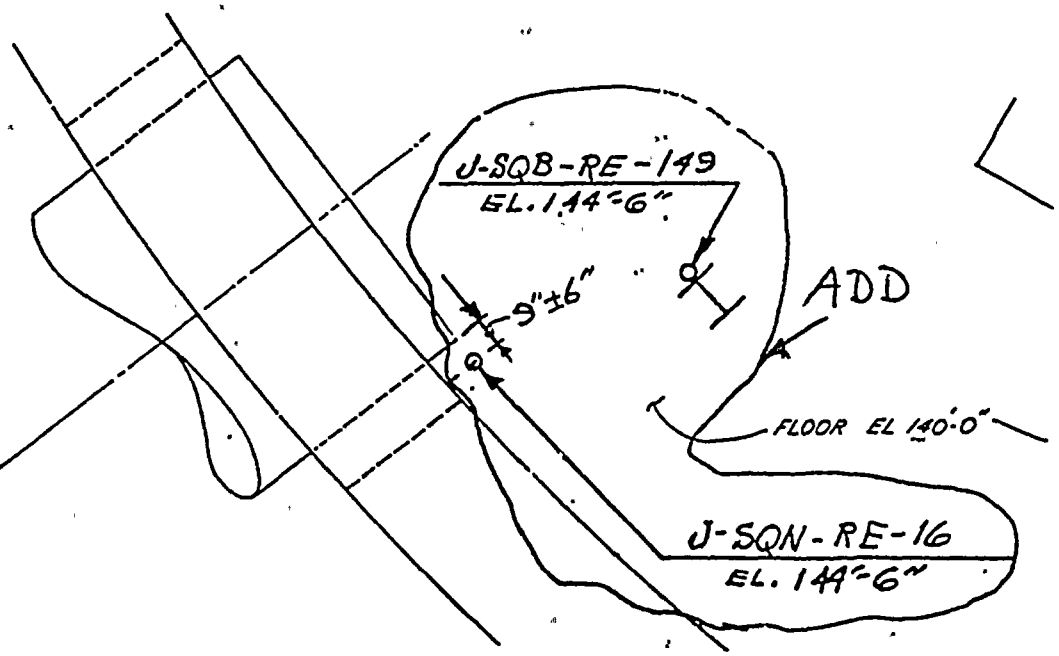
JOB NO. 10407 PAGE 2 OF 2

DATE: 8/11/81 BY: J.L. HUNT-CONTROLS

DESCRIPTION OF CHANGE

ADD RE-16 (EXISTING) & RE-149 AS SHOWN

AS BUILT DRAWING



NRC QUESTIONS 471.3 (c)

NUREG-0737, Item III.D.3.3 - Does not state that a minimum of three portable airborne iodine samplers will be available on the site.

PVNGS RESPONSE

See revised PVNGS LLIR, page III.D.3.3.-1, with the requested information, Attachment F.

III.D.3.3 IMPROVED INPLANT IODINE INSTRUMENTATION UNDER ACCIDENT CONDITIONS

Position

(1) Each licensee shall provide equipment and associated training and procedures for accurately determining the airborne iodine concentration in areas within the facility where plant personnel may be present during an accident.

(2) Each applicant for a fuel-loading license to be issued prior to January 1, 1981 shall provide the equipment, training, and procedures necessary to accurately determine the presence of airborne radioiodine in areas within the plant where plant personnel may be present during an accident.

PVNGS Evaluation

Prior to fuel load, procedures will be developed for determining airborne iodine concentration. Silver Zeolite or Charcoal cartridges will be used in conjunction with a portable pump or a fixed vacuum system. The cartridges will be removed to the counting laboratory for gamma spectrum analysis. Procedures will also define ALARA concepts for removal, transport, and analysis.

Insert A

PVNGS response to this item is included in the evaluation of section II.F.1 requirements. 1

Attachment F

INSERT A TO PAGE III.D.3.3-1

A minimum of three portable air samplers will be available onsite.

NRC QUESTION 471.16

(a) The minimum requirements for station personnel described in Section 13.1.2 are keyed to ANSI N18.1-71 as follows: Insert A, Page 13.1-22, wording for (Note d), for supervising radiation physicist is not included.

(b) Amended Section 13.1.2.3 does not show the number of radiation protection technicians assigned to each unit. The original number (6) of radiation protection technicians should be increased and Section 13.1.2.3 and Figure 13.1.6 should be revised accordingly.

PVNGS RESPONSE

See PVNGS FSAR pages 13.1-20, 21, 22 and 23, Attachment G.

The Training Director is responsible to the Support Services Manager for the preparation, coordination, and conduct of the station training program. He directs the activities of the Simulator Supervisor and the nuclear plant instructors.

13.1.2.3 Operating Shift Crews

An operating crew for each unit will normally consist of a Shift Supervisor and Assistant Shift Supervisor (both of whom will possess Senior Reactor Operator licenses), two Nuclear Operator III's (who will possess a Reactor Operator license) and four Nuclear Operator I's and/or II's. ~~(who will possess Senior Reactor Operator licenses), a Shift Foreman, and a Control Operator (both of whom will possess Reactor Operator licenses), and two Auxiliary~~ Operators. The minimum shift crew composition for various modes of operation is shown in table 13.1-2.

During refueling operations, when the reactor core configuration is being altered, a Senior Reactor Operator or a Senior Reactor Operator Limited to Fuel Handling will directly supervise the fuel handling activities and will have no other concurrent duties.

At least one member of each shift operating crew will be trained in the station radiation protection procedures and will be capable of performing routine or special radiation surveys using portable radiation detectors, use of protective barriers and signs, use of protective clothing and breathing apparatus, performance of contamination surveys, check on radiation monitors, and limits of exposure rates and accumulated dose.

The Shift Supervisor is responsible for implementing the radiation protection program in the absence of the Radiation Protection Foreman (refer to section 12.1.1.2).

INSERT 13.1D

Attachment C

INSERT 13.1D

" A qualified Radiation Protection Technician shall be assigned to each shift in each unit with fuel loaded in the reactor.

During refueling operations or when numerous radiation protection activities are in progress, additional radiation protection technicians will be assigned and supervision provided, as needed.

Table 13.1-2

MINIMUM SHIFT CREW COMPOSITION(a)

(FOR EACH UNIT)

	Applicable Modes(b)	
License Category	1, 2, 3 & 4(e)	5 & 6
SOP (SRO)	1 2(c)	1(c),d)
OP (RO)	2	1
Non-Licensed	2	1

a. Shift crew composition may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of this table.

b. Operational modes are as defined in the Technical Specifications.

c. Does not include the licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling, supervising Core Alterations.

INSERT 13.1E

13.1.3 QUALIFICATIONS OF NUCLEAR PLANT PERSONNEL

13.1.3.1 Qualification Requirements

The recommendations of Regulatory Guide 1.8, Personnel Selection and Training, are used as the basis for establishing minimum qualifications for nuclear power plant personnel.

1

Attachment G

INSERT 13.1E.

" (c) At least one of the unit senior reactor operators on site and on shift will be a shift supervisor. At least one senior reactor operator will be in the unit control room during mode 1 through 4 operations for each unit, HOWEVER, THIS REQUIREMENT will not prevent brief absences to allow response to in plant conditions.

(d) Does not include the licensed senior reactor operator or senior reactor operator limited to fuel handling, supervising core alterations. A licensed senior operator is required to directly supervise any core alteration activity.

(e) A shift technical advisor shall be on site and on shift (available within 10 minutes) whenever one or more units are operating in modes 1 through 4. "

The minimum requirements for station personnel described in section 13.1.2 are keyed to ANSI ~~N18.1-1971~~ ANS 3.1-1978 as follows:

Position	ANSI N18.1-1971 Position (Paragraph No.)
Plant Manager	Plant Managers (4.2.1)
Assistant Plant Manager	Plant Managers (4.2.1)
Engineering and Technical Services Superintendent	Technical Manager (4.2.4)
Nuclear Supervisor	Reactor Engineering & Physics (4.4.1)
Radiological and Chemistry Supervisor	Radiation Protection Manager, (Note a)
Support Services Manager	Supervisor not requiring AEC license (4.3.2)
Maintenance Superintendent	Maintenance Manager (4.2.3)
Operations Superintendent	Operations Manager (4.2.2), no license
Scheduling and Licensing Supervisor	Supervisor not requiring AEC license (4.3.2)
Operations Engineering Supervisor	Supervisor not requiring AEC license (4.3.2)
Computer Supervisor	Supervisor not requiring AEC license. (4.3.2)
Station Services Supervisor	Supervisor not requiring AEC license (4.3.2)
Electrical Supervisor	Supervisor not requiring AEC license (4.3.2)
Quality Supervisor	Note b
Training Supervisor	Supervisor not requiring AEC license (4.3.2)

INSERT A

Attachment G

INSERT A

Position	ANS 3.1-1978 Position (Paragraph No.)
Manager of Nuclear Operations	Plant Manager (4.2.1)
Engineering and Technical Services Manager	Technical Manager (4.2.4)
Nuclear Supervisor	Reactor Engineering & Physics (4.4.1)
Licensing Supervisor	Supervisor not requiring AEC License (4.3.2)
Operations Engineering Supervisor	Supervisor not requiring AEC License (4.3.2)
Chemistry Supervisor	Radiochemistry (4.4.3)
Radiation Protection Supervisor	Radiation Protection Manager (Note a)
Supervising Radiation Physicist	Radiation Protection (4.4.4) (Note d)
Maintenance Superintendent	Maintenance Manager (4.2.3)
Maintenance Control Center Supervisor	Supervisor not requiring AEC License (4.3.2)
Instrumentation and Control Supervisor PLANT INSTRUMENT AND CONTROL TECHNICIAN	Instrumentation and Control (4.4.2) REPAIRMAN (4.5.3)
Station Services Supervisor	Supervisor not requiring AEC License (4.3.2)
Mechanical Supervisor PLANT MECHANIC	Supervisor not requiring AEC License (4.3.2) REPAIRMAN (4.5.3)
Electrical Supervisor PLANT ELECTRICIAN	Supervisor not requiring AEC License (4.3.2) REPAIRMAN (4.5.3)
Administrative Services Manager	Supervisor not requiring AEC License (4.3.2)
Operations Superintendent	Operations Manager (4.2.2) No License
Operating Supervisor	Supervisor Requiring AEC License (4.3.1) (Note c)
Shift Supervisor	Supervisor Requiring AEC License (4.3.1)
Assistant Shift Supervisor	Supervisor Requiring AEC License Operators-(Licensed)-(4.5.1)
Nuclear Operator III	Operators (Licensed) (4.5.1)
Nuclear Operator I & II	Operator (Not Licensed) (4.5.1)
Operations Quality ASSURANCE Manager	(Note b)
Training Manager	Supervisor not requiring AEC License (4.3.2)
Security Manager	Supervisor not requiring AEC License (4.3.2)

Position	ANSI N18.1-1971 Position (Paragraph No.)
Mechanical Supervisor	Supervisor not requiring AEC license (4.3.2)
Chemistry Supervisor	Radiochemistry (4.4.3)
Radiation Protection Supervisor	Radiation Protection (4.4.4)
Instrumentation and Control Supervisor	Instrumentation and Control (4.4.2)
Operating Supervisor	Supervisor Requiring AEC License (4.3.1) (Note c)
Shift Supervisor	Supervisor Requiring AEC License (4.3.1)
Assistant Shift Supervisor	Operators (Licensed) (4.5.1)
Nuclear Operator (licensed)	Operators (Licensed) (4.5.1)
Nuclear Operator (not licensed)	Operator (Not Licensed) (4.5.1)
Plant Mechanic	Repairman (4.5.3)
Plant Electrician	Repairman (4.5.3)
Plant Instrumentation and Control Technician	Repairman (4.5.3)

NOTES:

a. The Radiological-and-Chemistry Supervisor (Radiation Protection) will meet the recommendations of the regulatory position of Regulatory Guide 1.8 for the Radiation Protection Manager.

b. The Operations Quality Assurance Manager shall have at least 6 years experience in the field of quality assurance. At least 6 months of the 6 years shall be in nuclear quality assurance. A minimum of 2 years of the 6 years shall be related technical or academic training.

NRC QUESTION 471.17

The revised resume of radiation protection supervisor (Mr. McDuffee) should be provided.

PVNGS RESPONSE

Mr. McDuffee's resume is provided, Attachment H.

Attachment H

STATION PERSONNEL RESUME

J. W. McDuffee

Radiation Protection Supervisor

PVNGS

Educational Background	Professional Level Experience
Phoenix College 1960-1961 Nuclear Power Plant Operators Course Fort Belvoir, VA 1966-1967 Radionuclide Analysis by Gamma Spectroscopy, Montgomery, AL 1967 Accelerator Radiation Protection, Rockville, MD 1969 Internal Dosimetry for Fixed Nuclear Facilities, Oak Ridge, Tennessee	U.S.Navy Nuclear Operator SM1, Nuclear Power Plant, Fort Belvoir, VA 1967 Shift Supervisor PM-3A Nuclear Power Plant 1968 Radiation Protection Supervisor Armed Forces Radiological Research Institute 1969-1970 Supervisor Operational Health Physics Counting Laboratory Armed Forces Radiological Research Institute 1971 Radiation Health Section Leader Submarine Tender 1971-1974 Arizona Public Service Company Radiation Protection Supervisor 1978-Present

PLANT NORTH
TRUE NORTH
40° UNIT 1
60° UNIT 2
80° UNIT 3

MATCH LINE 4Rc.1 ZC3A DWG N° 13-J-ZCF-012

CONTAINMENT
REACTOR VESSEL

REFUELING POOL

FUEL TRANSFER CONSOLE

HYDR. PWR PACK

REGENERATIVE HTX HATCH

WINCH

HOLD

J-HCN-ET-487 EL. 152'-0"

V-123 HI EL. 165'-0"

V-124 LO EL. 165'-0"

T.O. PLATF. EL. 155'-0"

T.O. PLATF. EL. 149'-6"

T.O. PLATF. 146'-6"

T.O.G. 158'-6"

J-SGN-PT-23 EL. 173'-0"

V-010 EL. 178'-0" REF. N.960'-9⅜" REF.

T.O. PLATF. EL. 136'-0"

E.2598'-0" REF.

MATCH LINE AREA ZC3D DWG N° 13-J-ZCF-015

FLOOR EL 140'-0"

SAFETY INJECTION TANK SIB-XOIE 2B

CLEAN-UP UNIT HCN-FOIB

24"

KEY PLAN LEVEL 3

C3A C3B C3E T3A T3B T3C T3D T3E T3F T3G T3H T3J T3K T3L T3M A3A A3B A3C A3D B3A B3B B3C B3D J3A&B J3C G3A

NOTES:

TERA APERTURE CARD

Attachment E

8109290336-01

CERTIFIED DRAWING

CHG. NO.	REFERENCE	NO.	DATE	REVISIONS	DR	CHK	DGS	ENG	EGS	CNP ENG	PRJ ENG
		0	7/9/81	ISSUED FOR CONSTRUCTION	D.P.	JSD	—	WPH	AJ	—	WPH

BECHTEL LOS ANGELES

ARIZONA NUCLEAR POWER PROJECT
PALO VERDE NUCLEAR GENERATING STATION

CONTAINMENT BUILDING
INSTRUMENT LOCATION PLAN
EL. 140 FT. LEVEL 3 ZC 3C

SCALE 3/16" = 1'-0"	JOB NO.	DRAWING NO.	REV.
ENGR'G. MGR.	10407	13-J-ZCF-014	0

SCALING RULES

SIZE E

PLANT NORTH

TRUE NORTH

40° UNIT 1
60° UNIT 2
80° UNIT 3

2"

J-HCN-TE-40
EL. 188'-0" SEE NOTE 1

CLEAN-UP UNIT
HCN-E01A

SAFETY INJECTION
TANK SIE-X01D

J-SMN-XSH-9

N. 1050'-0"

E. 3050'-0"

MAIN STEAM
LINE OPENINGS

3'-0" REF.

4'-6"

J-SQN-PI-09
EL. 173'-0"

V-117
EL. 172'-0"

T.O. PLATF.
EL. 136'-6"

N. 1041'-3⅜" REF.

T.O.G
EL. 168'-6"

E. 4004'-1" REF.

T.O. PLATF.
EL. 141'-3"

T.O. PLATF. EL. 146'-6"

T.O. WALL EL 155'-0"

STEAM GENERATOR
N°1 - RCN-E01A

T.O. PLATF.
EL. 149'-6"

T.O. PLATF
EL. 155'-0"

DW

DW

REACTOR HEAD
LAYDOWN AREA

J-SQN-RE-17
℄ EL. 145'-6"

℄ RAIL

INCORE DETECTORS
SEAL TABLE

TOC. EL 90-6⅞"
UPPER GUIDE STRUCTURE
LAYDOWN AREA

℄ REACTOR

℄ CONTAINMENT

MATCH LINE AREA ZC3A DWG N° 13-J-ZCF-012

MATCH LINE AREA ZC3D DWG N° 13-J-ZCF-015

KEY PLAN LEVEL 3

C3A | C3E | T3A | T3B | T3C | T3D | T3E | T3F
F3ABB | C3C&D | T3G | T3H | T3J | T3K | T3L | T3M
A3A | A3B
A3C | A3D
R3A | R3B | J3ABB | J3C
R3C | R3D
G3A

NOTES
1. INSTALL TE PER INSTALLATION DETAIL

TERA APERTURE CARD

Attachment D

8109290336-02

CERTIFIED DRAWING

R

NO.	DATE	REVISIONS	DR	CH'K	DGS	ENG	ECS	CMP ENG	PRJ ENG
1	7/6/81	INCORPORATES DCN NO 1, ADDS RE-PA, CORRECTED TITLE	DR	JSD	—	[illegible]	[illegible]	—	[illegible]
0	12/29/80	ISSUED FOR CONSTRUCTION	[illegible]	[illegible]	—	[illegible]	[illegible]	—	[illegible]

BECHTEL
LOS ANGELES

ARIZONA NUCLEAR POWER PROJECT
PALO VERDE NUCLEAR
GENERATING STATION

INSTRUMENT LOCATION PLAN
CONTAINMENT BUILDING
EL. 140 FT. LEVEL ZCSD

SCALE 3/8"=1'-0"	JOB NO.	DRAWING NO.	REV.
ENGR'G. APPR.	10407	13-J-ZCF-013	1

SIZE D

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