

REGULATOR INFORMATION DISTRIBUTION ITEM (RIDS)

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 FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Public 05000528
 STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Public 05000529
 STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Public 05000530
 AUTH. NAME: AUTHOR AFFILIATION
 VAN BRUNT, E. E. Arizona Public Service Co.
 RECIP. NAME: RECIPIENT AFFILIATION
 KNIGHTON, G. Licensing Branch 3

SUBJECT: Submits connected copy of response to Generic Ltr 82-33 re requirements for emergency response capabilities. Schedule & description of phased implementation & integration of emergency response activities encl.

DISTRIBUTION CODE: A003S COPIES RECEIVED: LTR 1 ENCL 40 SIZE: 29
 TITLE: OR/Licensing Submittal: Suppl 1 to NUREG-0737 (Generic Ltr 82-33)

NOTES: Standardized plant. 05000528
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 ADD: W. Paulson

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NRR/DL/ORB5	5 5	NRR/DSI/CPB	1 1
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Arizona Public Service Company

P.O. BOX 21666 • PHOENIX, ARIZONA 85036

April 14, 1983
ANPP-23505 - WFQ/MAJ

CORRECTED COPY

Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
Licensing Branch No. 3
Division of Licensing
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: 83-056-026; G.1.01.10

Reference: 1. Generic Letter 82-33 - Supplement 1 to NUREG-0737,
Requirements for Emergency Response Capabilities, dated
December 17, 1982.

Dear Mr. Knighton:

On December 17, 1983, Arizona Public Service Company received the above Reference, NRC Generic Letter 82-33, Supplement 1 to NUREG-0737, Requirements for Emergency Response Capability. Reference (1) requires Arizona Public Service to submit to the NRC a schedule for meeting the requirements contained in Supplement 1 of NUREG-0737 and a description of the phased implementation and integration of the emergency response activities.

Arizona Public Service Company's response to meeting the requirements of Reference (1) for Palo Verde Nuclear Generating Station (PVNGS) Unit 1 is attached to this letter in the following manner:

- Attachment 1 - Safety Parameter Display System (SPDS)
- Attachment 2 - Detailed Control Room Design Review (DCRDR)
- Attachment 3 - Regulatory Guide 1.97 - Application to Emergency Response Facilities
- Attachment 4- Upgrade Emergency Operating Procedures (EOPs)
- Attachment 5- Emergency Response Facilities
- Attachment 6- Integrated Training Plan

The present PVNGS Units 2 and 3 schedule for implementation of the emergency response activities contained in the requirements of Supplement 1 of NUREG-0737 are scheduled for completion by each units corresponding fuel load date.

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Add:
W. Paulson

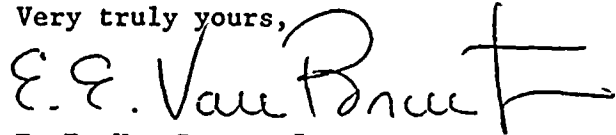
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Mr. G. Knighton
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We believe this information adequately responds to your request per Reference (1).

If you have any further questions, please contact me.

Very truly yours,

A handwritten signature in dark ink, appearing to read "E. E. Van Brunt, Jr.", with a stylized flourish at the end.

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

EEVB/MAJ/sp
Attachment

cc: E. Licitra
A. C. Gehr



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
Edwin E. Van Brunt, Jr.

Sworn to before me this 14th day of April, 1983.

Norma D. Wright
Notary Public

My Commission expires:

May 5, 1984

SAFETY PARAMETER DISPLAY SYSTEM (SPDS)

The SPDS for Palo Verde Nuclear Generating Station is designed to aid control room personnel continuously during normal, abnormal, and emergency conditions in determining the safety status of the plant and in assessing whether abnormal conditions warrant corrective action by the operators. The SPDS for PVNGS Unit 1 is 100% complete in design, 80% complete in installation, and will be fully installed with the sensor inputs and operable by fuel load. The remaining installation work on the SPDS encompasses a portion of the sensor installation and cable terminations. The computer system, with the Unit 1 Cathode Ray Tube (CRT) displays, are in the Final Field Availability Test Stage and are scheduled to be completed by mid June, 1983.

Procedures and operator training addressing actions with and without the SPDS will be complete and implemented 90 days after equipment is installed. The Plant Operations Staff User Training is on-going with a 50% complete status.

The SPDS Safety Analysis and SPDS Implementation Plans are in progress and Arizona Public Service Company (APS) plans to submit them by about July 15, 1983. The Safety Analysis will describe the basis for parameter selection to assess the safety status of each identified function for a wide range of events, along with the specific implementation plan for the SPDS.

APS does not desire the optional Pre-Implementation Review by the NRC. We feel that the SPDS is so close to completion that there isn't sufficient time for a Pre-Implementation Review. Upon completion of the SPDS, APS will request to have the required Post-Implementation Review of the SPDS through our NRC Project Manager.

DETAILED CONTROL ROOM DESIGN REVIEW

Arizona Public Service Company (APS) committed to performing a complete Control Room Design Review (CRDR) in response to NUREG-0660 and 0737, Task I.D.1 in June, 1980. To provide Human Factors expertise to the review team, APS through our engineer, Bechtel Power Corporation engaged Torrey Pines Technology (TPT), who brought on board experts from McDonnell-Douglas to aid in the performance of the Human Factors Study.

An internal Program Plan was prepared in August, 1980. All the available guidance published (NUREG/CR-1580) at the time was used to perform the study. The study was performed at the Palo Verde Nuclear Generating Station (PVNGS) control room simulator which is a replica of the plant's control rooms and was completed August, 1981 with the exception of the items listed in Supplement 1 to PVNGS SER NUREG-0857.

A Summary Report was transmitted to the NRC on August 14, 1981. This Summary Report gave the basis under which the program was performed and the basis under which all identified Human Engineering Discrepancies (HED's) were resolved. The Summary Report described the multi disciplinary review team and the type of analysis and surveys that were performed during the study. The NRC reported the results of their review of the program in NUREG-0857 as follows: "However, based on the quality of those aspects of the control room reviewed, the thoroughness of the applicant's PDA [CRDR], and the corrections proposed by the applicant, and further improvements to be required by supplements to this SER, the staff believes that suitable corrections of human engineering discrepancies can be implemented so as to provide an acceptable control room design."

The NRC Human Factors Engineering Branch (HFEB) performed a CRDR/Audit from September 15 through September 17, 1981 at the control room simulator. The Staff also briefly reviewed the control room in Unit 1 and verified the similiarity between the simulator and the control room. The HFEB review team identified a number of HED's in addition to those identified in the APS study. These additional HED's were transmitted to APS on October 28, 1981. The reviews have been documented in an SER, NUREG-0857, that was issued in November, 1981.

After completion of the remaining portion of the study as listed in NUREG-0857 Supplement 1, a supplement to the PVNGS CRDR Summary Report will be issued by July 1, 1983. With the issue of that supplement, APS will have completed its CRDR and satisfied the requirements of NUREG-0737, Task I.D.1.

Systems and items which required further review by the NRC were discussed in the PVNGS NUREG-0857 SER Supplement 1, Section 22.2, Item I.D.1. All items listed in this section of the SER will be completed 120 days prior to fuel load, with the following exceptions:

PVNGS NUREG-0857 SER Supplement 1 Task I.D.1 Items 4, 8, 9 and 13 will be delayed.

4. Environment

- Temperature and humidity
- Ventilation
- Emergency lighting
- Auditory
- Personal storage
- Ambience and comfort

8. The actual discernability and reliability of audio signals above ambient noise could not be measured.

9. The capability of complete internal and external communications during emergencies (i.e., paging at the remote shutdown panel and/or direct communication with back panels, shift supervisor's office, etc.) could not be evaluated.

13. The following instrumentation system which HFEB typically reviews were not available.

(a) In-core Thermocouple instrumentation displays, and

(b) Sub-Cooling monitor instrumentation displays.

These items will be reviewed in a period of 6 weeks following carpet installation. Proposed solutions and implementation schedules for any identified HED's for deferred items will be transmitted to the staff prior to exceeding 5% power. Proposed solutions of HED's and implementation schedules for all the other items will be provided prior to fuel load.

REGULATORY GUIDE 1.97

The following Arizona Public Service Company response to Regulatory Guide 1.97 requirements (Table 1) provides a comparison between the PVNGS Unit 1 design and the requirements contained in Supplement 1 of NUREG-0737 concerning Reg. Guide 1.97.

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 1

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
<u>TYPE "A" VARIABLES</u>									These "Plant Specific" variables have been incorporated into Type B, C, D, and E variables listed below. Complies with the Regulatory Guide.
<u>TYPE "B" VARIABLES</u>									
Neutron Flux 10 ⁻⁶ % to 100% F.P. (Category 1)	Q1E	Yes	2x10 ⁻⁸ to 200%	1E with Batt Backup	4 channels on MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Control Rod Position; Full In or Not Full In (Category 3)	Q1E	Yes	0-100% 0-150 In	1E with Batt. Backup	MCB & PMS	No	No	08/83	Complies with R.G. 1.97 (Rev. 2)
RCS Soluable Boron Concentration; 0-6000 PPM (Category 3)	R2E	No	0-5000/ 0-2500 PPM	Inst. Bus with Batt. Backup	MCB & PMS	Yes	Yes	08/83	
	S2E	No	0-6000 PPM	Station Power	No	Yes	Yes	02/84	Complies with R.G. 1.97 (Rev. 2)
RCS Cold Leg Water Temp; 50° to 750°F (Category 1)	Q1E	No	50° to 750°	1E with Batt. Backup	Yes	Yes	Yes	02/84	Complies with R.G. 1.97 (Rev. 2)
RCS Cold Leg Water Temp; 50° to 400°F (Category 3)									Complies - (See previous listing)
RCS Hot Leg Water Temp; 50° to 750°F (Category 1)	Q1E	Yes	50° to 750°F	1E with Backup	Yes	Yes	Yes	02/84	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 2

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
RCS Pressure; 4000 psig (For CE Plants) (Category 1)	Q1E	Yes	0-4000 psig	1E with Batt.	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Core Exit Temp. 200°F to 2300°F (Category 3)	Q1E	Yes	32° to 2300°F	1E with Backup	Yes	Yes	Yes	11/83	Complies with R.G. 1.97 (Rev. 2)
		fixed incore)							
Coolant Level in Reactor; bottom of core to top of Vessel (Category 1)	Q1E	Yes	0 to 100%	1E with Batt. Backup	Yes	Yes	Yes	11/83	Complies with R.G. 1.97 (Rev.2)
Degrees of Subcooling; 200°F subcooling to 35°F superheat (Category 2)	Q1E	No	+700 to -2100°F	1E with Batt. Backup	Yes	Yes	Yes	11/83	Complies with R.G. 1.97 (Rev.2)
RCS Pressure 4000 psig for CE Plants (Category 1)									Complies (See previous listing) (See Page 1)
Containment Sump Water Level; Narrow Range (Sump) (Category 2)	R20	No	0-6 ft.	Non-1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Wide Range (Bottom of Containment to 600,000 gal. Level Equivalent) (Category 1)	Q1E	Yes	0.5 to 11.5 ft	1E with Batt. Backup	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 3

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Containment Pressure 0 to Design Pressure (Category 1)	Q1E	Yes	-4 to 20 psig	1E with Batt. Backup	MCB & PMS	No	No	08/83	Complies with R.G. 1.97 (Rev. 2)
	Q1E	Yes	-4 to 85 psig	1E with Backup	MCB & PMS	No	No	08/83	Complies with R.G. 1.97 (Rev. 2)
	Q1E	Yes	-5 to 180 psig	1E with Backup	1 Indicated 1 Recorded	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev.2)
Containment Isolation Valve Position Closed/Not Closed (Category 1)	Q1E	Yes	Open/ Closed	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev.2)
Containment Pressure 10 psig to Design Pressure (Category 1)									Complies - (See previous listing)
<u>TYPE "C" VARIABLES</u>									
Core Exit Temperature 200° to 2300°F (Category 1)									Complies - (See previous listing) (See Page 2)
Radioactive Concentration or Radiation Level in Circulating Primary Coolant 1/2 Tech. Spec. Limit to 100 Times Tech. Spec. Limit R/hr. (Category 1)	Q1E	Yes	1 R/hr to 10 ⁵ R/hr	1E with Batt. Backup	Yes in 2 places	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 4

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Analysis of Primary Coolant (Gamma Spectrum) 10 Mci/gm to 10 Ci/gm Isotopic Analysis in Coolant Volume (Category 3)	R3D	No	1 Identifi- cation Power of Isotope 10Mci/gm to 10 Ci/gm	Station	Yes	Yes	Yes	02/84	Complies with R.G. 1.97 (Rev. 2)
RCS Pressure; 4000 psig (For CE Plants) (Category 1)									Complies - (See previous listing) (See Page 2)
Containment Pressure 10 psig To Design Press (Category 1)									Complies - (See previous listing) (See Page 3)
Containment Sump Water Level (Category 2)- Narrow Range Sump (Category 1)- Wide Range Bottom of Containment to 600,000 Gal. Level Equivalent									Complies - (See previous listing) (See Page 2)
Containment Area Radiation Monitors 1 R/hr to 10 ⁴ R/hr (Category 3)	Q1E	Yes	10 ⁻¹ to 10 ⁴ R/hr	1E with Batt. Backup	Yes, in 2 places	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Effluent Radioactivity- Noble Gas Effluent from Condenser Air Removal System Exhaust 10 ⁻⁶ MCI/cc to 10 ⁻² MCI/cc (Category 3)	Q2E	Yes	10 ⁻⁶ to 3 MCI/cc 3x10 ⁻² to 10 ⁵ MCI/cc	Instrument Bus Power	Yes	Yes	Yes	08/83	Hi/Lo Range on each of condenser air removal, plant vent, and Fuel Bldg. Vent. Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 5

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
RCS Pressure (4000 psig for CE Plants) (Category 1)									Complies - (See previous listing) (See Page 2)
Containment Hydrogen Concentration 0-10% Capable of Operating from 10 psig Up To Max. Design 60 psig Pressure (Category 1)	Q1E	Yes	0-10% H ² con- centration	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Containment Pressure 10 psig to 3 Times Design Pressure (180 psig) (Category 1)									Complies - (See previous listing) (See Page 3)
Containment Effluent Radioactivity - Noble Gases from Identified Release Points. 10 ⁻⁶ MCi/cc to 10 ⁻² MCi/cc (Category 2)	Q2E	Hi/Lo	10 ⁻⁶ to 10 ⁻³ MCi/CM ³ 3x10 ⁻² to 10 ⁵ MCi/cc	Instrument Yes Bus Power		Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Radiation Exposure Rate (Inside Bldg. or areas, eg, Aux. Bldg., Reactor Shield Bldg. Annulus Fuel Handling Bldg. which are in direct contact with primary containment where penetra- tions & hatches are located) 10 ⁻¹ to 10 ⁴ R/hr (Category 2)	Q2E	Yes	10 ⁻¹ to 10 ⁴ R/hr	Instrument Yes Bus.		Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

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Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Effluent Radioactivity Noble Gases from Bldgs 10 ⁻⁶ MCi/cc to 10 ⁻³ MCi/cc (Category 2)	Q2E	Yes	10 ⁻⁶ MCi/cc to 10 ⁻³ ; MCi/cc 3x10 ⁻² to 10 ⁵ MCi/cc	Instrument Yes Bus Power	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
<u>TYPE "D" VARIABLES</u>									
RHR System Flow 0-110% Design Flow (Category 2)	Q1E	Yes	0-133% Design Flow	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
RHR Heat Exchanger Outlet Temperature 32°-350°F (Category 2)	Q1E	Yes	40°- 400°F	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2) With the exception of our actual ranges are 40° - 400°F.
Safety Injection Tank (Accumulator) Level (Category 2)	Q1E	Yes	0-100%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Safety Injection Tank Pressure; 0-750 psig (Category 2)	Q1E	Yes Tank	15-765 psia	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Safety Injection Tank (Accumulator) Isol. Valve Position Open or Closed (Category 2)	Q1E	Yes	0-100%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Boric Acid Charging Flow 0-110% Design (Category 2)	Q1E	Yes	0-113%	1E with backup	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 7

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Flow in HPSI System 0 to 110% (Category 2)	Q1E	Yes	0-110%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Flow in LPSI System 0-110% (Category 2)	Q1E	Yes	Exceeds 0-110%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Refueling Water Storage Tank Level Top to Bottom (Category 2)	Q1E	Yes	0-33 ft	1E	Yes	Yes	Yes	07/83	Complies with R.G. 1.97 (Rev. 2)
	Q1E	Yes	Top to Bottom (0-52 ft)	1E	Yes (MCB & PMS)	Yes	Yes	08/83	
RCP Status Motor Current (Category 3)	High Indus- trial Std.	Yes	0-600 Amps	Non-1E	MCB	No	No	Complete	Complies with R.G. 1.97 (Rev. 2)
Primary System Safety Relief Valve Positions (Including PORVs & Code Valves) or Flow through or Pressure in Relief Valve Lines Closed/Not Closed (Category 2)	Q2E	Yes	Closed/ Open (0-100%)	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Pressurizer Level Bottom to Top (Category 1)	Q1E	Yes	0-100%	1E	MCB & PMS	Yes	Yes	Complete	Complies with R.G. 1.97 (Rev. 2)
Pressurizer Heater Status Electric Current (Category 2)	Q2E	No	On/Off	1E	Yes	No	No	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1

APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 8

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Quench Tank Level (Reactor Drain Tank) Top to Bottom (Category 3)	Q2E	No	0-100%	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Quench Tank Temperature 50 to 750°F (Category 3)	R9E	No	0° to 750°F	Non-1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Quench Tank Pressure 0 to Design Pressure (Category 3)	Q1E	No	0-150 psig	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Steam Generator Level From Tube Sheet to Separators (Category 1)	Q1E	Yes	0-100%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Steam Generator Pressure From atmospheric pressure to 20% above the lowest safety valve setting (Category 2)	Q1E	Yes	0-1524 psia	1E	MCB & PMS	Yes	Yes	Complete	Complies with R.G. 1.97 (Rev. 2)
Safety/Relief Valve Positions or Main Steam Flow; Closed/Not Closed (Category 2)	Q2E	No	Open/ Closed 0-100%	1E	Yes	Yes	Yes	Complete	Complies with R.G. 1.97 (Rev. 2)
Main Feedwater Flow 0-110% Design Flow (Category 3)	R9E	Yes	0-110%	Non-1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Auxiliary Feedwater Flow 0-110% Design Flow (Category 2)	Q1E	Yes	Exceeds 0-110%	1E	Yes, in 2 Places	Yes	Yes	Complete	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 9

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Condensate Storage Tank Level; Plant Specific (Category 1)	Q1E	Yes	0-100%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Containment Spray Flow 0-110% Design Flow (Category 2)	Q1E	Yes	0-128%	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Heat Removal by the Containment Fan Heat Removal System Plant Specific (Category 2)	No	No	No	No	No	No	No	No	Complies with R.G. 1.97 (Rev. 2) Indication is per containment atmospheric temp. See Footnote (3).
Containment Atmospheric Temperature; 40-400°F (Category 2)	Q2E	Yes	40-400°F	Non-1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Containment Sump Water Temperature; 50-250°F (Category 2)	Q2E	No	50-250°F	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Makeup Flow-In (Charging) 0-110% Design (Category 2)	Q1E.	Yes	Exceeds 0-110% Design	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Letdown Flow-Out 0-110% Design (Category 2)	R1E	Yes	Exceeds 0-110% Design	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Volume Control Tank (VCT) Level; Top to Bottom (Category 2)	R1E	Yes	0-100%	1E	MCB & PMS	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Component Cooling Water to ESF System; 32-200°F (Category 2)	Q2E	Yes	0-200°F	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Component Cooling Water Flow to ESF System; 0-110% Design (Category 2)	Q2E	Yes	Exceeds 0-110% Design	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
High Level Radioactive Liquid Tank Level Top to Bottom (Category 3)	R20	Yes	0-100%	Non-1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Radioactive Gas Holdup Tank Pressure 0 to 150% Design Pressure (Category 3)	R20	Yes	0-400 psig	Non-1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2) with the exception of the 0-150% design pressure range requirement (See Footnote (6))
Emergency Ventilation Damper Position Open/Closed (Category 2)	Q1C	Yes	Open/ Closed Status	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
Status of Standby Power & Other Energy Sources Important to Safety (Hydraulic Pneumatic) volt- ages, currents, pressures (Category 2)	Q1E	Yes	Various	1E	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
<u>TYPE "E" VARIABLES</u>									
Containment Area Radiation -High Range 1R/hr to 10 ⁷ R/hr (Category 1)	Q1E	Yes	1- 10 ⁷ R/hr	1E with Batt. Backup	Yes 2 Places	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

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Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Radiation Exposure Rate (inside bldgs or areas where access is required to service equipment important to safety). 10^{-1} R/hr to 10^4 R/hr. (Category 2)									Complies - (See previous listing) (See Page 5)
<u>Noble Gases and Vent Flow Rate</u>									
°Containment or Purge effluent 10^{-6} MCi/cc to 10^5 MCi/cc 0-110% Vent Design Flow (Category 2)									Complies - (See previous listing) (See Footnote (2)) (See Page 6)
°Reactor Shield Bldg Annulus (If in Design)									(Not in Design)
°Auxiliary Bldg Airborn Radioactivity (Including any bldg containing primary system gases e.g. waste gas decay tank) 10^{-6} MCi/cc to 10^3 MCi/cc 0-110% Vent Design Flow									Complies - (See previous listing) (See Footnote (2)) (See Page 5)
°Condenser Air Removal System Exhaust 10^{-6} MCi/cc to 10^5 MCi/cc 0-110% Vent Design Flow (Category 2)									Complies - (See previous listing) (See Footnote (2)) (See Page 5)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
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Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
°Common Plant Vent Discharging Any of above releases (if containment purge is included) 10^{-6} MCi/cc to 10^4 MCi/cc 0-110% Vent Design Flow (Category 2)									Complies - (See previous listing) (See Footnote (2)) (See Page 5)
°Vent from Steam Generator Safety Relief Valves or Atmospheric Dump Valves. 10^{-1} MCi/cc to 10^3 MCi/cc (Category 2)	S2E	No	10^{-1} MCi/cc to 10^3 MCi/cc	Non-1E	Yes	Yes	Yes	02/84	Complies with R.G. 1.97 (Rev. 2)
°All other identified release points 10^{-6} MCi/cc to 10^2 MCi/cc (Category 2)									(None) (See Footnote (2))
All identified plant release points (except steam generator safety relief valves or atmospheric steam dump valves and condenser air removal system exhaust). Sampling with on-site analysis capability. For particulates and halogens. 10^{-3} MCi/cc to 10^2 MCi/cc 0-110% Vent Design Flow (Category 3)									Complies (See previous listing) (See Footnote (2)) (See Page 5)

TABLE 1
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Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Radiation exposure meters (continuous indication at fixed locations). Range, location, & qualification criteria to be developed to satisfy NUREG-0654, Sect. II.4.5b and 6b requirements for emergency radiological monitors.	Q2E	10 Locations	10 ⁻¹ to 10 ⁴ R/hr	Instrument No	No	No	No	08/83	Complies with R.G. 1.97 (Rev. 2) Has alarm siren and light locally.
Airborn Radiohalogens & Particulates (Portable Sampling with on-site analysis capability) 10 ⁻⁹ MCi/cc to 10 ⁻³ MCi/cc (Category 3)	R3D	No	10 ⁻⁹ MCi/cc to 10 ⁻³ MCi/cc	Portable	No	No	No	Completed	Complies with R.G. 1.97 (Rev. 2)
Plant & Environs Radiation 10 ⁻³ R/hr to 10 ⁴ R/hr, Photons 10 ⁻³ RADS/HR to 10 ⁴ RADS/HR, Beta Radiations & Low-Energy Photons (Portable Instrumentation)	High Industrial Grade	No	Exceeds This Range	Portable	No	No	No	Completed	Complies with R.G. 1.97 (Rev. 2)
Plant & Environs Radioactivity (Portable instrumentation) Multi-channel gamma ray spectrometer (Category 3)	High Industrial Grade	No	Multi Channel	Portable	No	No	No	Completed	Complies with R.G. 1.97 (Rev. 2)
Wind Direction (Category 3)	High Industrial Grade	No	Exceeds Requirement	Non IE with Backup	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

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Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
*0-360° (+ or - 5° accuracy with a deflection of 15°). Starting speed of 1 mph damping ratio between 0.4 & 0.6, distance constant less than or equal to 2 meters.									
Wind Speed (Category 3)	High Indus- trial	No	See Foot- note (7)	Non-1E with Backup	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2) Except for Range Requirement (See Footnote (7))
*0-67 mph (+ .5 mph accuracy) for wind speeds less than 25 mph with a threshold of less than 1 mph.									
Estimation of Atmospheric Stability (Category 3)	High Indus- trial Std.	No	Exceeds Require- ments with 1 exception (see Foot- note 4)	Non-1E with Backup	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2) See Footnote (4)
Based on vertical temper- ature difference from primary system -9°F to 18°F & + .3°F accuracy per 164' intervals or analogous range for alternative stability estimates.									

(See Page 16 for notes and explanation of abbreviations)

TABLE 1
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

Page 15

Variable Per Reg. Guide 1.97 (Rev. 2)	DESIGN CLASS(5)	REDUN DANCY	RANGE	POWER SUPPLY	CR	TSC	EOF	UNIT I SCHEDULE	COMMENTS
Primary Coolant and Sump (Grab Sample) (Category 3)	S2D	No	1-4 ml.	Station Power	Yes 2 Places	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
°Gross Activity 10 MCi/mi to 10 Ci/mi			10 ⁻¹ MCi/mi to						
°Gamma Spectrum (isotopic Analysis)			10 Ci/Mi						
°Boron concentration 0 to 6000 PPM			0-6000 PPM						
°Chloride Content 0 to 20 PPM			0-20 PPM						
°Dissolved hydrogen or Total Gas 0 to 2000 cc/kg			0-2000 STP cc/kg						(For Total Gas)
°Dissolved Oxygen 0 to 20 PPM			0-20 PPM						
°pH 1 to 13			1-13 with Temp. Compensation						
Containment Air Grab Sample (Category 3)	S2E	No		Station Power	Yes	Yes	Yes	08/83	Complies with R.G. 1.97 (Rev. 2)
°Hydrogen Content 0 to 10%			0 to 10%						
°Oxygen Content 0 to 30%			1 to 30%						
°Gamma Spectrum (Isotopic Analysis)			Isotopic Analysis						

(See Page 16 for notes and explanation of abbreviations)

TABLE 1

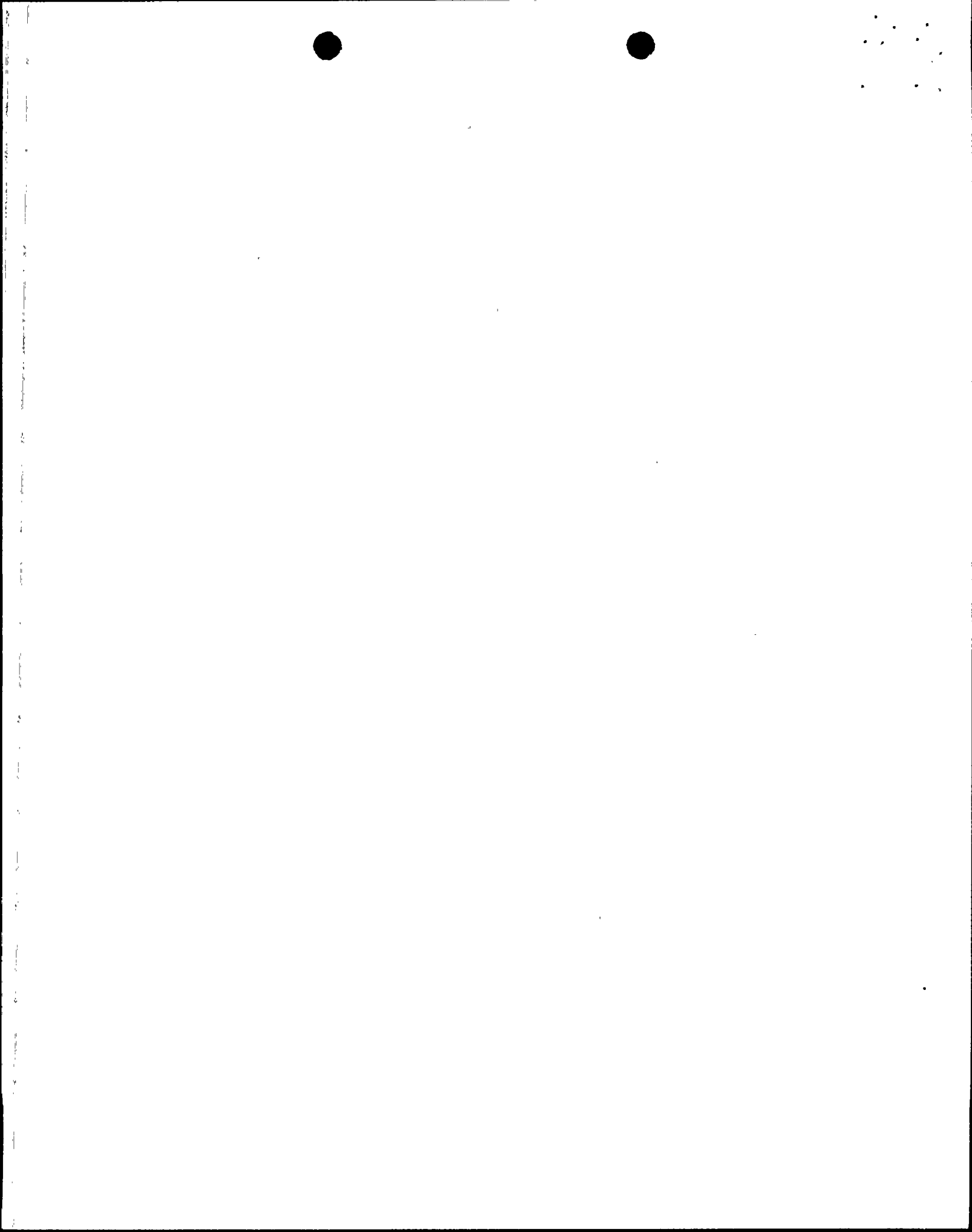
APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

NOTES1. LIST OF ABBREVIATIONS

ASSUR	-	Assurance
BATT	-	Battery
CEA	-	Control Element Assembly
CR	-	Control Room
ENVIR	-	Environmental
EOF	-	Emergency Operations Facility
FP	-	Full Power
IN	-	Inches
M	-	Micro (u)
MCB	-	Main Control Board
PMS	-	Plant Monitoring System (Plant Computer)
PPS	-	Plant Protection System
QUAL	-	Qualification
RCP	-	Reactor Coolant Pump
RHR	-	Residual Heat Removal
SEIS	-	Seismic
S/G	-	Steam Generator
TSC	-	Technical Support Center

2. FOOTNOTES

- (1) Reg. Guide 1.97, Rev. 2, Category 2 sensors shall be qualified in accordance with Regulatory Guide 1.89 (NUREG-0588). Seismic Qualification in accordance with Regulatory Guide 1.100 shall be provided when the instrumentation is part of a safety related system. (Reference Independent Design Review of the PVNGS Instrumentation and Controls Systems, June 17-18, 1981, pages 2C3-1 through 2C3-28). The components qualified seismic 2 are given in the reference. This complies with the Regulatory Guide.
- (2) Vent flow calculations are performed using the design flow of heating, ventilation, and air conditioning fans versus measured flow.
- (3) Heat removal by containment fan heat removal system indication is accomplished using the containment atmospheric temperature monitors listed within R.G. 1.97.
- (4) Delta temperature (vertical temperature difference) range for estimation of atmospheric stability of -6 to +18°F has proven to be adequate and reliable; evidenced by historical data at the location.



NOTES: (continued)

(5) DESIGN DEFINITIONS

QUALITY CLASS DEFINITIONS

1. Quality Class Q

Any structure, system, or component which, as a result of being defective, could cause or increase the severity of a nuclear incident that would impose undue risk to the health and safety of the public shall be designated Quality Class Q. All engineered safeguard systems fall within this classification.

For items in this classification, the requirement of 10CFR50, Appendix B, as interpreted by ANSI N45.2-1971 shall be met to ensure the highest quality standard.

2. Quality Class R

Any structure, system, or component which, as a result of being defective, could cause a safety hazard to station personnel, an unscheduled reduction in unit output, or a unit trip, shall be designated Quality Class R.

The quality requirements of Quality Class R items may be similar to those for Quality Class Q except that 10CFR50, Appendix B is not applicable. The purpose of the quality program for "R" listed items is to assure reliable operation.

3. Quality Class S

Any structure, system, or component not included in Quality Class Q or R shall be designated as Quality Class S. In general, the quality requirements for equipment in Quality Class S will be the industry standard. Any specific requirements will be included in the equipment specification.

SEISMIC CATEGORY DEFINITIONS

1. Seismic Category 1

Structures, systems, and components which are important to safety and are designed to remain functional in the event of a Safe Shutdown Earthquake (SSE), are designated as Seismic Category 1. In addition Seismic Category 1 structures, systems, and components are designed to remain functional and within applicable stress and deformation limits (elastic range of materials) when subjected to the effects of the vibratory motion of the operating basis earthquake (OBE) in combination with normal operating loads.

APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

NOTES: (continued)

2. Seismic Category 2

Seismic Category 2 structures, systems, and components are those Non-Seismic Category 1 structures, systems, and components which are essential to power generation or whose failure could cause a safety hazard to station personnel. Seismic Category 2 structures, systems, and components shall be designed such that they will experience no malfunction when acted upon by the static loads stipulated.

3. Seismic Category 3 Requirements

Structures, systems, and floor- or wall-mounted components not designated Seismic Category 1 or 2 are designated Seismic Category 3 except for components like electrical cable, or material like reinforcing steel or cement.

Floor- or wall-mounted Seismic Category 3 components shall be designed to withstand an equivalent static seismic load of 0.05g times the mass of the equipment in any direction applied to the center of gravity of the component, and not experience any structural failure of that part of the component that is secured to the foundation. Seismic Category 3 tanks and structures shall meet the Uniform Building Code for Seismic Zone 2.

4. Seismic Category 9 Requirements

Seismic Category 9 structures, systems, and components are those Non-Seismic Category 1, 2, or 3 structures, systems, and components including the associated supporting structure that must be designed to retain structural integrity during and after an SSE but do not have to retain operability for protection of public safety. The basic requirement is prevention of structural collapse and damage to equipment and structures required for protection of the public safety.

5. Components With No Seismic Requirements

There are no seismic requirements for Non-Seismic Category 1 or 2 line- mounted components or components such as electrical cable, or material like reinforcing steel, or cement.

CODE CLASSIFICATION DEFINITIONS

<u>Code Classification</u>	<u>Applicable Code and Standard</u>
D	ANSI B31.1, Power Piping
E	Electrical Industry and IEEE (Institute of Electrical and Electronics Engineers Standards)
O	Recognized Industry Standards



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APS RESPONSE TO REGULATORY GUIDE 1.97 REQUIREMENTS

NOTES: (continued)

- (6) Radioactive gas holdup tank pressure (decay tank pressure) range requirement is not met. Actual range is 0-400 PSIG; design pressure is 380 PSIG (150% of design pressure is 570 PSIG).
- (7) Wind speed requirements of Regulatory Guide 1.97 are exceeded except the range of 0-67 mph. The actual range is 0-50 mph; has proven adequate by historical data.

UPGRADE EMERGENCY OPERATING PROCEDURES (EOP)

Arizona Public Service Company has completed the upgrade of the EOPs to be consistent with the Technical Guidelines and the Procedure Writers Guide. The Technical Guidelines for Combustion-Engineering Pressurized Water Reactors were submitted to the NRC by the C-E Owners Group as CEN-152, "Combustion Engineering Emergency Procedure Guideline," dated November 22, 1982. USNRC Generic Letter 83-09 provides preliminary acceptance of CEN-152 and requests that the plant specific implementation begin. Arizona Public Service Company will submit a Procedure Generation Package in accordance with the requirements contained in Supplement 1 of NUREG-0737 to the NRC by June 1, 1983. This Procedure Generation Package will be based on CEN-152, Technical Guidelines. Implementation and personnel training on the upgraded EOPs will also be described in the Procedure Generation Package. Training and implementation of the upgraded EOPs will be completed prior to fuel load assuming NRC approval with no comments of the Procedure Generation Package.

EMERGENCY RESPONSE FACILITIES

Arizona Public Service Company has reviewed the requirements contained in Supplement 1 of NUREG-0737 concerning the Emergency Response Facilities and intends to comply with the requirements of Supplement 1.

The Emergency Response Facilities, the TSC, OSC, and EOF, systems and instrumentation will be completed prior to fuel load. Procedures and personnel training are scheduled to be completed prior to May 11, 1983. Arizona Public Service has confidence that the Emergency Response Facilities at PVNGS will provide adequate capability to respond to emergencies.



INTEGRATED TRAINING PLAN

Arizona Public Service Company's (APS) integrated training plan will be completed by fuel load. APS will provide training as discussed in the requirements of Supplement 1 of NUREG-0737. This training pertains to the Emergency Response Facilities (ERFs), Emergency Operating Procedures (EOPs), Safety Parameter Display System (SPDS), Detailed Control Room Design Review (DCRDR), and the instrument displays based on Regulatory Guide 1.97. This training will enable Palo Verde Nuclear Generation Station operators to comprehend plant conditions and to cope with emergencies effectively.

