

ENCLOSURE TO AEP:NRC:07730

STATUS REPORT

IMPLEMENTATION PLAN OF REGULATORY GUIDE 1.97, REVISION 3,
FOR THE DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

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I. Background

In August 1984, AEPSC contracted the engineering consulting firm of DiBenedetto, Farwell & Hendricks to perform the detailed design study required to determine the Donald C. Cook Nuclear Plant (DCCNP) Units 1 & 2 compliance with Regulatory Guide 1.97, Revision 3. A preliminary Status Report (AEP:NRC:0773J dated February 28, 1985), based on preliminary findings by our consultant, was submitted to the NRC staff. A final report was to have been issued by our consultant by June, 1985, but because of various delays, the consultant's report is not available at this time. Work has progressed well enough so that we believe a final submittal, as committed to in AEP:NRC:0773J, can be made. Any inconsistencies between the consultant's final report and this submittal will be resolved and, if necessary, this submittal will be revised accordingly.

II. Status Report

The table included with this enclosure contains information regarding instrument range, environmental qualification, seismic qualification, quality assurance, redundancy, power supply, location of display and required actions, and a schedule for each type A,B,C,D, and E variable listed in Regulatory Guide 1.97, Revision 3. The definitions of these variables are provided in Section III. This table is consistent in organization with Table 3 (PWR Variables) of Regulatory Guide 1.97, Rev. 3 dated May, 1983. In some instances, the Type B-E variables are duplicated by the Type A variable listing. In these instances, reference back to the Type A variable is made because the requirements for Type A variables are the most stringent. The schedule and status for each instrument indicates when the requirements of Regulatory Guide 1.97, as described in this enclosure, will be met. Certain requirements of Regulatory Guide 1.97 were judged to be unreasonable to backfit in an operating plant. Justification is provided for these requirements to which we take exception and are given in the footnotes located at the end of this enclosure. The following general notes provide clarifications for each category of information requested by section 6.2 of Supplement 1 to NUREG 0737 with the exception of instrument range, which is self explanatory:

1. Sensor Location

The "sensor(s) location(s)" information requested in Section 6.2(e) of Supplement 1 to NUREG 0737 is assumed to mean the application and not physical plant location. This information is provided in the column labeled "variable."

2. Environmental Qualification

Instruments reported as environmentally qualified (marked "Y" in the column labeled "EQ") are planned to meet the provisions of 10 CFR 50.49. As allowed by 10 CFR 50.49(k), original DCCNP instrumentation located in a potentially harsh environment has been qualified, as a minimum, in accordance with the "DOR Guidelines". Equipment ordered after February 22, 1983, is to have environmental qualification in accordance with Category I of NUREG 0588 (For Comment) (i.e. IEEE Std 323-1974) unless there are sound reasons to the contrary. Further, equipment located in a mild environment is not environmentally qualified. We believe the above position to be consistent with the current licensing status of the DCCNP.

3. Seismic Qualification

Instruments reported as seismically qualified (i.e., marked "Y" in the column labeled "SQ") are planned to meet the provisions of DCCNP Updated FSAR p. 7.2-12 dated July 1982 (i.e., protection grade equipment is designed such that, for a design basis earthquake, the equipment will not lose its capability to perform its design objective, to shut the plant the plant down and/or maintain the unit in a safe shutdown condition.) Typical equipment of this type originally installed at DCCNP was seismically tested by Westinghouse Electric Corporation as documented in WCAP-7397-L, "Topical Report Seismic Testing of Electrical and Control Equipment" dated January, 1970. No industry standards regarding seismic qualification existed at that time. Equipment ordered for Regulatory Guide 1.97 upgrading is planned for seismic qualification in accordance with IEEE Std. 344-1975 unless there are sound reasons to the contrary. Again, we believe this position to be consistent with the current licensing status of the DCCNP.

4. Quality Assurance

Instruments reported as meeting quality assurance requirements (i.e., marked "Y" in the column labeled "QA") are planned to meet the provisions of the DCCNP QA program as described in DCCNP Updated FSAR Section 1.7 dated July, 1985. We believe this program, as described, satisfies the requirements of 10 CFR 50, Appendix B. The implementation of specific Regulatory Guides and ANSI standards regarding quality assurance are consistent with the commitments of DCCNP FSAR Section 1.7 Appendix A dated July, 1985.

5. Redundancy

Instruments reported as meeting the single failure criterion or redundancy requirements (i.e., marked "Y" in the column labeled "SF") are planned for a minimum of two (2) redundant, electrically independent channels up to and including any isolation device. The display may be a common multi-pen recorder or a dual indicator. The redundant channels are also physically separated in accordance with DCCNP Updated FSAR p. 7.2-4 dated July, 1982. Physical separation requirements for redundant Post Accident Monitoring Instrumentation channels will be established in a manner consistent with the application of separation criteria for existing plant IE instrumentation & control circuits. The extent of conformance to Regulatory Guide 1.75 for D. C. Cook Plant IE systems was given in the answer to question 40.6 in FSAR Appendix Q, Unit 2, p. 40.6-2. In some instances, redundancy will be provided by measurement of a diverse variable.

6. Power Supply

Instruments reported as meeting Class IE power supply requirements (i.e., marked "IE" in the column labeled "PS") are planned to be powered from IE power supplies such as the 120V AC instrument buses or the 250V DC buses as described in DCCNP Updated FSAR Sections 8.1 and 8.3 dated July, 1982.

7. Display Location

The display will be indicated either inside the control room or at another location as permitted by Regulatory Guide 1.97.

8. Schedule

The implementation schedule provided for each variable is the current best estimate of the completion of the final configuration for the associated instrument including redundancy, final displays, power supplies, documentation of qualification and turnover to plant operations. The schedules are based on anticipated delivery and plant outage schedules. Equipment delivery delays, environmental qualification test difficulties, or other problems, however, may cause delays in these schedules beyond our reasonable control. Since the consultant's engineering study has not yet been completed, and some items listed may require revision or deletion, the final configuration will not be determined until the EOP's and DCRDR program have been implemented and integrated with the Regulatory Guide 1.97 schedule. Considering these factors, our overall target date for completion of work undertaken in response to Regulatory Guide 1.97 is by the end of the Unit 2 refueling outage presently scheduled for 1989.

It is noted that although many variables presently listed are measured with fully functional instrumentation, they are not considered operational in the sense that they meet Reg. Guide 1.97 requirements. As noted previously in this document, we have not yet updated all instruments and associated equipment to meet Reg. Guide 1.97 requirements. In addition, it should be noted that instruments previously reported to the staff as meeting the requirements of NUREG 0737 or IE Bulletin 79-01B do not, in all cases, meet all of the requirements of Regulatory Guide 1.97.

Because of the additional information obtained after our preliminary submittal in February, 1985, and discussions with the NRC staff and their consultant (EG&G), there are many differences between our preliminary submittal and this final submittal. All item numbers in the tables in Section III have been retained, regardless of whether they are used in order to provide easy cross referencing between the preliminary and final reports. Major changes involve reassigning variables from Type A to other classifications due to further evaluation of plant EOP's and completion of information not available at the time of our original submittal. Other miscellaneous corrections and revisions have been made due to the more complete information that is now available.

III. TABLES

These tables represent the status of the Donald C. Cook Nuclear Plant when we will have completed all of the requirements associated with Regulatory Guide 1.97, Rev. 3. It does not, nor is it intended to, reflect the status of the plant as of the date of this letter.

The schedules provided in this enclosure for meeting Regulatory Guide 1.97 requirements are not intended to change any previous commitment regarding NUREG 0737 or 10 CFR 50.49, whose requirements may be different.

Type A Variables: "those variables to be monitored that provide the primary information required to permit the control room operator to take specific manually controlled actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for design basis accident events. Primary information is information that is essential for the direct accomplishment of the specified safety functions; it does not include those variables that are associated with contingency actions that may also be identified in written procedures." Note: These variables are plant-specific and based on review of the D. C. Cook Nuclear Plant Emergency Operating Procedures (EOP's) plus anticipated future changes to the EOP's. The schedule and status for each instrument indicated is for when all of the requirements of Regulatory Guide 1.97, Rev 3 will be met.

Item No.	Purpose	Variable	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
A-1	Maintain Pressurizer Level during S/G Tube rupture	Centrifugal Chg Pump Flow	IFI-51,52, 53,54	0-200 GPM	Y	Y	Y	Y	IE	Control Room Panel SIS	Qualify or replace control room indicators with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
A-2	Manual Trip of RC Pumps based on RCS pressure	RCS Pressure (wide range)	NPS-121,122	0-3000psig	Y	Y	Y	Y	IE	Control Room Panel RHR	Qualify or replace control room recorder with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
A-3				NOT USED									
A-4				NOT USED									
A-5				NOT USED									
A-6				NOT USED									
A-7	Determination of required core exit temperature by S/G Pressure	S/G Pressure	MPP-210,211, 212,220, 221,222, 230,231, 232,240, 241,242	0-1200psig	Y	Y	Y	Y	IE	Control Room Panel SC	Qualify or replace control room indicators with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage

Item No.	Purpose	Variable	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
A-8	Determination of adverse containment	Containment Sump Level	NLA-310 NLI-311,320, 321	589.5 to 614 ft. elevation (bottom of sump to max flood level)	Y	Y	Y	Y	IE	Control Room Panel RHR	Qualify or replace control room indicators with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
A-9	Manual Reduction of ECCS Flow (Secondary heat sink capability)	S/G Level Narrow range	BLP-110,111, 112,120, 121,122, 130,131, 132,140, 141,142	From below 1st stage separator to 2nd stage separator	Y	Y	Y	Y	IE	Control Room Panel SG	Qualify or replace control room indicators and/or recorders with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
A-10	Manual Reduction of ECCS Flow	Pressurizer Level	NLP-151,152, 153	0-100% (96% of Total Volume)	Y	Y	Y	Y	IE	Control Room Panel PZR (NLP-151 also HSD)	Qualify or replace control room indicators and/or recorders with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
A-11			NOT USED										
A-12	Determination of adverse containment	Containment Area Radiation Monitor High Range	VRA-1310, 1410, (Unit 1) 2310, 2410 (Unit 2)	1 R/HR to 1X10 ⁶ R/HR	Y	NA	Y	Y	IE	Control Room Panel RMS	See footnote (c)	NA	NA
A-13	Manually establish or trip containment spray	Containment Pressure (Narrow range)	PPP-300,301, 302,303	-5 to +12 psig	NA	Y	Y	Y	IE	Control Room Panel SPY	Qualify or replace indicators with seismically qualified equipment See footnote (d)	1987 re-fueling outage	1987 re-fueling outage
A-14				NOT USED									

Item No.	Purpose	Variable	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
A-15	Manual Reduction of ECCS Flow (Secondary heat sink capability)	Auxiliary Feedwater Flow	FFI-210,220, 230,240	0-250 KPPH	Y	Y	Y	Y	IE	Control Room Panel SC	Redundancy provided by diverse variable - S/G narrow range level which is qualified. Qualify or replace indicators, power supplies, and square root converters with seismically qualified equipment. Power from IE source.	1987 re-fueling outage	1987 re-fueling outage
A-16	Manual Transfer to cold leg recirculation in low level in RWST	RWST Level	ILS-950,951	essentially Top to Bottom (100% of Total Volume)	NA	Y	Y	Y	IE	Control Room Panel SPY	Qualify or replace indicators and/or recorders with seismically qualified equipment. Also see footnote (d)	1987 re-fueling outage	1987 re-fueling outage
A-17	Manual Trip or reduction of Pressurizer Spray and ECCS Flow	Degrees Sub-cooling	NA	0-199°F sub-cooling 0-199°F Superheat	Y	NA	Y	NA	IE	Control Room Panel BA	See footnotes (b) & (c) which apply beyond the isolating devices	NA	NA
A-18			NOT USED										
A-19				NOT USED									
A-20				NOT USED									
A-21				NOT USED									
A-22				NOT USED									
A-23				NOT USED									
A-24				NOT USED			Y						
A-25	Manual Reduction of ECCS Flow	Core Exit T/C's	T/C 1-65	200-2300°F	Y		Y	Y	IE	Control Room Panel FI (U-1) Panel RMS (U-2)	All required cables, connectors, indicators, signal processing equipment to be replaced with qualified equipment (Unit 2 only. No action required Unit 1)	NA	See footnote (g)

Item No.	Purpose	Variable	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
A-26				NOT USED									
A-27				NOT USED									
A-28	Manual trip of RCP's	CCP Breaker Status	Pump IE,IW	OPEN/CLOSE	NA	Y	Y	Y	IE	Control Room Panel BA	Qualify or replace control room indicators with seismically qualified equipment See footnotes (d) & (m)	End of 1988	End of 1988
A-29	Manual trip of RCP's	SI Pump Breaker Status	Pump IN,IS	OPEN/CLOSE	NA	Y	Y	Y	IE	Control Room Panel SIS	Qualify or replace control room indicators with seismically qualified equipment See footnotes (d) & (m)	End of 1988	End of 1988
A-30				NOT USED									
A-31				NOT USED									
A-32				NOT USED									
A-33				NOT USED									
A-34	Manual Trip of RCP's	Safety Injection Pump Flow	IFI-260,266	0-800GPM	NA	Y	Y	Y	IE	Control Room Panel SIS	Qualify or replace control room indicators with seismically qualified equipment. See footnote (d)	1987 re-fueling outage	1987 re-fueling outage
A-35	Identify Ruptured Steam Generator	S/G Blowdown Radiation	DRA-300,353	10-10E06 CPM	NA	Y	Y	Y	IE	Control Room Panel RMS	Qualify or replace all components with seismic-ally qualified equipment and power from IE source. See footnote (d)	1988 re-fueling outage	1989 re-fueling outage
A-36				NOT USED									
A-37				NOT USED									

Type B Variables: "those variables that provide information to indicate whether plant safety functions are being accomplished. Plant safety functions are (1) reactivity control, (2) core cooling, (3) maintaining reactor coolant system integrity, and (4) maintaining containment integrity (including radioactive effluent control)." Note: The schedule and status of each instrument is for when all of the requirements of Regulatory Guide 1.97, Rev-3 will be met.

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
B-1	Reactivity Control	Neutron Flux	1	NE-41A,41B, 42A,42B, 43A,43B, 44A,44B	0-120% full power	NA	Y	Y	Y	IE	Control Room Panel NIS	None Required See footnote (f)	NA	NA
B-2		Control Rod Position	3	CA1-8, CB1-4 CC1-8, CD1-9 SA1-8, 5B1-8	Full in or not full in	NA	NA	NA	NA	NA	Control Room Panel RC	None required	NA	NA
B-3		RCS Soluble Boron Concentrate	3	NSX-101,103	NA	NA	NA	NA	NA	NA	NA	See Item C-2 and footnote (a)	NA	NA
B-4		RCS Cold Leg Temperature	1	NTR-210,220, 230,240	0-700°F	Y	Y	Y	Y	IE	Control Room Panel DTU	Qualify or replace recorders with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
B-5	Core Cooling	RCS Hot Leg Water Temperature	1	NTR-110,120, 130,140	0-700°F	Y	Y	Y	Y	IE	Control Room Panel DTU	Qualify or replace recorders with seismically qualified equipment	1987 re-fueling outage	1987 re-fueling outage
B-6		RCS Cold Leg Water Temperature	1									See item B-4		
B-7		RCS Pressure										See item A-2		
B-8		Core Exit Temperature										See item A-25		

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
B-9		Coolant Inventory	1	NLI-110,111 120,121, 130,131	Top of head vent piping to bottom of vessel (100% of Volume)	Y	Y	Y	Y	IE	Control Room Panel SIS	None required	NA	NA
B-10		Degrees of Subcooling										See item A-17		
B-11	Maintaining RCS Integrity	RCS Pressure										See item A-2		
B-12		Containment Sump Water Level										See item A-8		
B-13		Containment Pressure (Wide Range)	1	PPA-310,312	-5 to 36psig	NA	Y	Y	Y	IE	Control Room Panel SPY	Qualify or replace Indicators/recorders, with seismically qualified equipment. Also see item A-13 for narrow range See footnote (d)	1987 re-fueling outage	1987 re-fueling outage
B-14	Maintaining Containment Integrity	Containment Isolation Valve Position (excluding check valves)	1	See listing in Attachment 1 to these tables	CLOSED - NOT CLOSED	Y	Y	Y	Y	IE	Control Room Panels IV, BA,SIS,SPY	Replace Limit switches with env & seismically qualified devices as noted in Attachments 1 & 2 to these tables. Qualify or replace control room indicators with seismically qualified equipment.	1988 re-fueling outage	1989 re-fueling outage
B-15		Containment Pressure										See items A-13 and B-13		

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Type C Variables: "those variables that provide information to indicate the potential for being breached or the actual breach of the barriers to fission product releases. The barriers are (1) fuel cladding, (2) primary coolant pressure boundary, and (3) containment."
 Note: The schedule and status for each instrument is for when all of the requirements of Regulatory Guide 1.97, Rev 3 will be met.

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
C-1	Fuel Cladding	Core Exit Temperature										See item A-25		
C-2		Radioactive concentration or Radiation Level in Circulating Primary Coolant	1	NSX-101,103	NA	Y	Y	Y	Y	Y	NA	See footnote (h) Replace solenoid valves with seismically and environmentally qualified equipment	1987 re-refueling outage	1987 re-refueling outage
C-3		Analysis of Primary Coolant (Gamma Spectrum)										See item C-2		
C-4	Reactor Coolant Pressure Boundary	RCS Pressure										See item A-2		
C-5		Containment Pressure										See items A-13 and B-13		
C-6		Containment Sump Water Level										See item A-8		
C-7		Containment Area Radiation										See item A-12		

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Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
C-8		Effluent Radioactivity-Noble gas Effluent from Condenser Air Removal System Exhaust	3	SRA-1900 (Unit 1 SRA-2900 (Unit 2)	10E-07 to 10E03 $\mu\text{Ci/cc}$	NA	NA	NA	NA	NA	Control Room CT-1 Control Terminal	No action required	NA	NA
C-9	Containment	RCS Pressure										See item A-2		
C-10		Containment Hydrogen Concentration	1	ESR-1 thru 9	NA	NA	Y	Y	Y	IE	NA	See footnote (d) No action required	NA	NA
C-11		Containment Pressure										See items A-13 and B-13		
C-12		Containment Effluent Radioactivity-Noble gases from identified release points	2	ERS-1300, 1400 (Unit 1) ERS-2300, 2400 (Unit 2)	10E-07 to 10E05 $\mu\text{Ci/cc}$	NA	NA	NA	NA	NA	Panel WDG	See footnote (d) No Action Required	NA	NA

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
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C-13

Effluent
Radioactiv-
ity-Noble
Gases (from
buildings or
areas where
penetra-
tions and
hatches are
located, eg,
secondary
containment
and AUX
buildings
that are in
direct con-
tact with
primary
containment

SEE ITEM C-12

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Type D Variables: "those variables that provide information to indicate the operation of individual safety systems and other systems important to safety. These variables are to help the operator make appropriate decisions in using the individual systems important to safety in mitigating the consequences of an accident." Note: The schedule and status for each instrument is for when all of the requirements of Regulatory Guide 1.97, Rev 3 will be met.

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
D-1	RHR System	RHR System Flow	2	IFI-310,311, 320,321	0-1500 GPM 0-5500 GPM	Y	NA	Y	NA	NA	Control Room Panel RHR	No Action Required	NA	NA
D-2		RHR Heat Exchange Outlet Temp	2	ITR-311,321	50-400°F	Y	NA	Y	NA	NA	Control Room Panel RHR	Replace RTD's with env. qualified equipment. See footnote (p)	1987 re-fueling outage	1987 re-fueling outage
D-3a	SI Systems	Accumulator Tank Level	2	ILA-110-,111, 120,121, 130,131, 140,141	0-133" wc (wide range) (52% of Total Volume) 105.8 to 121.7 in. (narrow range) (7.5% of Total Volume)	Y	NA	Y	NA	NA	Control Room Panel SIS	Replace one wide range transmitter with env. qualified equipment. See footnote (p)	1988 re-fueling outage	1989 re-fueling outage
D-3b		Accumulator Tank Pressure	2	IPA-110,111, 120,121, 130,131, 140,141	0-800 psig	Y	NA	Y	NA	NA	Control Room Panel SIS	Replace one transmitter/tank with env. qualified equipment	1988 re-fueling outage	1989 re-fueling outage
D-4		Accumulator Tank Isolation Valve Position	2	IMO-110,120, 130,140	Closed or Open	NA	NA	Y	NA	NA	Control Room Panel SIS	None Required See footnote (r)	1987 re-fueling outage	1987 re-fueling outage

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Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
D-5		Boric Acid Charging Flow										See item D-24		
D-6		Flow in HPI System										See item A-1		
D-7		Flow in LPI System										See item D-1		
D-8		RWST Level										See item A-16		
D-9	Primary Coolant System	RCP Status	3	Q1,Q2,Q3,Q4	0-1200A	NA	NA	NA	NA	NA	Control Room Panel RCP	No Action Required	NA	NA
D-10		Primary System Safety Relief Valve Positions or Flow Thru or pressure in Relief Valve Lines	2	QR-107 A,B,C,D	NA	Y	NA	Y	NA	NA	Control Room Panel RC	See footnote (b) No Action Required	NA	NA
D-11		Pressurizer Level										See item A-10		
D-12		Pressurizer Heater Status	2	Group A1,A2,A3,C1,C2,C3	ON/OFF	NA	NA	Y	NA	NA	Control Room Panel PZR	See footnote (d) No Action Required	NA	NA
D-13		Quench Tank Level	3	NLA-351	Essentially Top to Bottom (74% of Total Volume)	NA	NA	NA	NA	NA	Control Room Panel PZR	None required See footnote (p)	NA	NA
D-14		Quench Tank Temperature	3	NTA-351	50-750°F	NA	NA	NA	NA	NA	Control Room Panel PRZ	Increase Range from 50°F to 300°F to required 50-750°F	1987 re-fueling outage	1987 re-fueling outage

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Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
D-14a		Quench Tank Pressure	3.	NPA-351	-10 to 100 psig	NA	NA	NA	NA	NA	Control Room Panel PRZ	None Required	NA	NA
D-15	Secondary System (Steam Generator)	S/G Level	1	BLI-110,120,130,140 (wide range)	From 12" above tube sheet to separators	NA	NA	Y	Y	NA	Control Room Panel SG	None required See footnote (1)	NA	NA
D-16a		Safety/Relief Valve Positions	2									See Item D-16b for alternate instrumentation		
D-16b		Main Steam Flow	2	MFC-110,111,120,121,130,131,140,141	0-4x10 ⁶ PPH	Y	NA	Y	NA	NA	Control Room Panel SC	None required	NA	NA
D-17		Main Feed-water Flow	3	FFC-210,211,220,221,230,231,240,241	0-5x10 ⁶ PPH	NA	NA	NA	NA	NA	Control Room Panel BA	None required	NA	NA
D-18	Auxiliary Feed-water System	Aux Feed-water Flow										See item A-15		
D-19		Condensate Storage Tank Level	1	CLI-113 CLR-110,111	Essentially Top to Bottom (95% Total Volume)	NA	Y	Y	Y	IE	Control Panel	Qualify or replace instruments with seismically qualified equipment. See footnotes (d) & (p) (2 channels only)	1987 re-fueling outage	1987 re-fueling outage
D-20	Containment Cooling System	Containment Spray Flow	2	IFI-330,331 (Upper containment)	0-200GPM	NA	NA	Y	NA	NA	Control Room Panel SPY	No Action Required See footnotes (d) & (e)	NA	NA
D-21		Heat Removal by containment Heat Removal System										D. C. Cook Plant Units 1&2 do not have a Containment Heat Removal System, therefore this item does not apply	NA	NA

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
D-22		Containment Atmosphere Temperature	2	ETR-11,12,13, 14,15,16, 17,18,19, 20,21,22, 23,24,25, 26,27	0 to 400°F	Y	NA	Y	NA	NA	Control Room Panel A-14	Replace six (6) tech spec related RTD's with environmentally qualified equipment. Increase range from 0 to 300°F to as specified.	1988 re-fueling outage	1989 re-fueling outage
D-23		Containment Sump Water Temperature	2									No Action Required See footnote (j)		
D-24	Chemical and Volume Control System	Make up Flow-In	2	QFI-200	0-200 GPM	NA	NA	Y	NA	NA	Control Room Panel BA	No Action Required See footnote (d)	NA	NA
D-25		Letdown Flow Out	2	QFI-301	0-200 GPM	NA	NA	Y	NA	NA	Control Room Panel BA and HSD	No Action Required See footnote (d)	NA	NA
D-26		Volume Control Tank Level	2	QLC-451,452	Essentially top to bottom (65% of Total Volume)	NA	NA	Y	NA	NA	Control Room Panel BA	No Action Required See footnote (d) & (p)	NA	NA
D-27	Cooling Water System	CCW water Temperature to ESF System	2	CTR-410,415, 420,425	0-200°F	NA	NA	Y	NA	NA	Control Room Panel ESW	No Action Required See footnote (d)	NA	NA
D-28		CCW Flow to ESF System	2	CFI-410,419, 420,429	0-10000GPM 0-6000GPM	NA	NA	Y	NA	NA	Control Room Panel CCW	No Action Required See footnote (d)	NA	NA
D-29	Radwaste Systems	High Level Radioactive Liquid Tank Level	3	RLS-255,256	Essentially Top to Bottom (84% of Total Volume)	NA	NA	NA	NA	NA	Panel WDC	None required See footnote (p)	NA	NA

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Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
D-30		Radioactive Gas Holdup Tank Pressure	3	RPC-310,320, 330,340, 350,360, 370,380	0-225 psig	NA	NA	NA	NA	NA	Panel WDC	Increase range from 0-150 psig to 0-225 psig As specified	1987 re-fueling outage	1987 re-fueling outage
D-31	Ventilation System	Emergency Ventilation Damper Position	2	VCR-201 thru 207	Open-Closed	Y	NA	Y	NA	NA	Control Room Panel IV VCR-207 on Control Room Panel SPY	Replace Limit Switches VCR-201 & 202 with env. qualified equipment. Footnote (d) applies to VCR-203 thru 207. See footnote (s)	1988 re-fueling outage	1989 re-fueling
	Power Supplies	Status of Standby Power and other Energy Sources Important to Safety												
D-32a		Diesel Gen Status	2	DG1AB DG1CD	0-800A	NA	NA	Y	NA	NA	Control Room Panel SA	See footnote (d) No Action Required	NA	NA
D-32b		4kv Safety Related Power Systems Status	2	Bus T11A, T11B, T11C, T11D	0-150V	NA	NA	Y	NA	NA	Control Room Panel SA	See footnote (d) No Action Required	NA	NA
D-32c		250V Battery Power System Status	2	Battery AB Battery CD	0-300V	NA	NA	Y	NA	NA	Control Room Panel SA	See footnote (d) No Action Required	NA	NA
D-32d		120VAC Safety Related Power System Status	2	Channel I,II, III, IV	0-150V	NA	NA	Y	NA	NA	Control Room Panel SA	See footnote (d) No Action Required	NA	NA
D-32e		Instrument Air Status	2	XPI-100 XPI-50 XPI-20 XPI-85	0-150psig 0-100psig 0-60psig 0-160psig	NA	NA	Y	NA	NA	Control Room Panel SV	These are mechanical devices - no electrical components No Action Required	NA	NA

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Type E Variables: "those variables to be monitored as required for use in determining the magnitude of the release of radioactive materials and continually assessing such releases." Note: The schedule and status for each instrument is for when all of the requirements of Regulatory Guide 1.97, Rev. 3 will be met.

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
E-1	Containment Radiation	Containment Area Radiation High Range										See item A-12		
E-2	Area Radiation	Radiation Exposure Rate (inside buildings or where areas of access are required to service equipment important to safety)	3	VRC-301 NRA-340 RRA-322	10E-01 to 10E04 mR/hr	NA	NA	NA	NA	NA	Control Room Panel RMS	None required See footnote (p)	NA	NA
E-3a	Noble Gases and vent Flow Rate	Containment or Purge Effluent	2		SEE ITEM E-3e									
E-3b		Reactor Shield Building Annulus	2		SEE ITEM E-3e									
E-3c		Aux Building	2		SEE ITEM E-3e									
E-3d		Condenser Air Removal System Exhaust	2	SFR-1900 (Unit 1) SFR-2900 (Unit 2) SFR-401	10E-06 to 10E03 μ Ci/cc 0-2000 scfm	NA	NA	Y	NA	NA		See footnotes (d) & (p)	NA	NA

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Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
E-3e		Common Plant Vent	2	VRS-1500 (Unit 1) VRS-2500 (Unit 2) VRF-315	10E-07 to 10E05 μ Ci/cc 0-200K scfm	NA	NA	Y	NA	NA	Control Room CT-1 Control Terminal	None Required See footnote (d)	NA	NA
E-3f		Vent from S/G Safety Relief Valves	2	MRA-1600 1700 (Unit 1) MRA-2600 2700 (Unit 2)	3 to 20E05 μ Ci/cc	Y	NA	Y	NA	NA	Control Room Panel RMS	None Required	NA	NA
E-3g		Other identified release points	2	SRA-1800 (Unit 1) SRA-2800 (Unit 2) SFR-201	10E-07 to 10E03 μ Ci/cc 0-1000 scfm	NA	NA	Y	NA	NA	Control Room Panel FI	None Required See footnote (d)	NA	NA
E-4	Particulates and Halogens	All identified release points (except S/G Safety Relief valves and Condenser air removal System exhaust) Sampling and onsite analysis	3									See Item E-3e		
E-5a	Environ Radiation and Radioactivity	Airborne Radioactivity and Particulates sampling and analysis (portable)	3	NA	10-9 to 10-3 μ Ci/cc (minimum)	NA	NA	NA	NA	NA	NA	None Required	NA	NA

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E Q	S Q	Q A	S F	P S	Display Location	Remarks/Action Req'd	U-1 Schedule	U-2 Schedule
E-5b		Plant and Environs Radiation (Portable)	3	NA	10E-3 to 10E4 R/HR (minimum)	NA	NA	NA	NA	NA	NA	None required	NA	NA
E-5c		Plant and Environs Radioactivity (Portable)	3	NA	NA	NA	NA	NA	NA	NA	NA	None required	NA	NA
E-6	Meteorology	Wind Direction	3	EFR-410,411, 420,421	0-360°	NA	NA	NA	NA	NA	Control Room Panel Flx	None required	NA	NA
E-7		Wind Speed	3	EFR-400,401, 402,403	0-100 mph	NA	NA	NA	NA	NA	Control Room Panel Flx	None required	NA	NA
E-8		Estimation of Atmospheric Stability	3	ETR-400,401, ETQ-401,402 403,404	-35 to 50°C	NA	NA	NA	NA	NA	Control Room Panel Flx	None required	NA	NA
E-9a	Accident Sampling Primary Coolant and Sump	Gross Activity			SEE ITEM C-2									
E-9b		Gamma Spectrum			SEE ITEM C-3									
E-9c		Boron Content			SEE ITEM B-3									
E-9d		Chloride Content	3	NSX-101,103	NA	NA	NA	NA	NA	NA	NA	SEE ITEM C-2	NA	NA
E-9f		Dissolved H ₂ or total gas	3	NSX-101,103	0-2000 cc/kg	NA	NA	NA	NA	NA	NA	SEE ITEM C-2	NA	NA

Item No.	Purpose	Variable	Cat.	Tag Nos.	Range	E	S	Q	S	P	Display Location	Remarks/Action Req'd	U-1	U-2
						Q	Q	A	F	S			Schedule	Schedule
E-9g		Dissolved O ₂	3	NSX-101, 103	0-20 ppm	NA	NA	NA	NA	NA	NA	SEE ITEM C-2	NA	NA
E-9h		pH	3	NSX-101, 103	5.0 to 8.0 pH	NA	NA	NA	NA	NA	NA	SEE ITEM C-2	NA	NA
E-10a	Containment Air	H ₂ Content	3	ESX-001	NA	NA	NA	NA	NA	NA	NA	None required	NA	NA
E-10b		O ₂ Content	3	NA	NA	NA	NA	NA	NA	NA	NA	None required See footnote (q)	NA	NA
E-10c		Gamma Spec- trum	3	ESX-001	NA	NA	NA	NA	NA	NA	NA	None required	NA	NA

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ATTACHMENT NO.1 TO TYPE B VARIABLES TABLE ITEM NO. B-14

CONTAINMENT ISOLATION VALVES

Plant ID	Channel	Plant ID	Channel
CCR-455	ICCV to Reactor Supports	ECR-10	ICntnment H2 Sample & Return Valves
CCR-456	ICCV from Reactor Supports	ECR-11	ICntnment H2 Sample & Return Valves
CCR-457	ICCV from Reactor Supports	ECR-12	ICntnment H2 Sample & Return Valves
CCR-460	ICCV from Excess Letdown Hx	ECR-13	ICntnment H2 Sample & Return Valves
CCR-462	ICCV to Excess Letdown Hx	ECR-14	ICntnment H2 Sample & Return Valves
DCR-201	IRC Drain Tank to Vent Header	ECR-15	ICntnment H2 Sample & Return Valves
DCR-204	IRC Drain Tank to Gas Analyzer	ECR-16	ICntnment H2 Sample & Return Valves
DCR-205	IRC Drain Tank Suction Isolation	ECR-17	ICntnment H2 Sample & Return Valves
DCR-206	IRC Drain Tank Suction Isolation	ECR-18	ICntnment H2 Sample & Return Valves
DCR-207	INitrogen Supply to RC Drain Tank	ECR-19	ICntnment H2 Sample & Return Valves
DCR-301	IS/G Blowdown Sample Isolation	ECR-20	ICntnment H2 Sample & Return Valves
DCR-302	IS/G Blowdown Sample Isolation	ECR-21	ICntnment H2 Sample & Return Valves
DCR-303	IS/G Blowdown Sample Isolation	ECR-22	ICntnment H2 Sample & Return Valves
DCR-304	IS/G Blowdown Sample Isolation	ECR-24	ICntnment H2 Sample & Return Valves
DCR-310	IS/G #1, #2, #3 & #4 Blowdown Valves	ECR-23	ICntnment H2 Sample & Return Valves
DCR-320	IS/G #1, #2, #3 & #4 Blowdown Valves	ECR-25	ICntnment H2 Sample & Return Valves
DCR-330	IS/G #1, #2, #3 & #4 Blowdown Valves	ECR-26	ICntnment H2 Sample & Return Valves
DCR-340	IS/G #1, #2, #3 & #4 Blowdown Valves	ECR-27	ICntnment H2 Sample & Return Valves
DCR-600	IContainment Sump to Waste Holdup	ECR-28	ICntnment H2 Sample & Return Valves
DCR-601	IContainment Sump to Waste Holdup	ECR-29	ICntnment H2 Sample & Return Valves
DCR-610	IIce Condenser Drain to Drain Header	GCR-314	INitrogen Supply to Accumulators
DCR-611	IIce Condenser Drain to Drain Header	ICR-5	IAccumulator Sample Valves
DCR-620	ICntnment Ventilation Drain to Hldup	ICR-6	IAccumulator Sample Valves
DCR-621	ICntnment Ventilation Drain to Hldup	MCR-251	ISample from Main Steam Lines
ECR-416	IContainment Liquid Sampling System	MCR-252	ISample from Main Steam Lines
ECR-417	IContainment Liquid Sampling System	MCR-253	ISample from Main Steam Lines
ECR-496	IContainment Liquid Sampling System	MCR-254	ISample from Main Steam Lines
ECR-497	IContainment Liquid Sampling System	NCR-105	IPrimary System Hot Leg Sample
ECR-535	IContainment Gas Sampling System	NCR-106	IPrimary System Hot Leg Sample
ECR-536	IContainment Gas Sampling System	NCR-107	IPressurizer Liquid Sample
OCR-919	ICont. Demin. Cleanup Water Isol.	NCR-108	IPressurizer Liquid Sample
OCR-920	ICont. Demin. Cleanup Water Isol.	NCR-109	IPressurizer Steam Sample
		NCR-110	IPressurizer Steam Sample
		OCR-300	ILetdown Line Isolation Valve
		OCR-301	ILetdown Line Isolation Valve
		NCR-252	IPrmary Hkup H2O to Prsgrizer Rlf Tnk
		OCR-250	IRCP Seal H2O Return Isolation Valve
		OCR-350	IRCP Seal H2O Return Isolation Valve
		RCR-100	IPrsgrizer Rlf Tnk to Gas Analyzer
		RCR-101	IPrsgrizer Rlf Tnk to Gas Analyzer
		VCR-10	IGlycon Supply to Containment
		VCR-11	IGlycon Supply to Containment

CONTAINMENT ISOLATION VALVES

Plant ID	Channel
VCR-20	IGlycon Return from Containment
VCR-21	IGlycon Return from Containment
XCR-100	ICntrl Air to Cntnment Isolation Valve
XCR-101	ICntrl Air to Cntnment Isolation Valve
XCR-102	ICntrl Air to Cntnment Isolation Valve
XCR-103	ICntrl Air to Cntnment Isolation Valve
GCR-301	IN2 Supply to Pressurizer Relief Tnk
CCM-451	ICCV fr RCPs Lvr Guide Bearing Cooler
CCM-452	ICCV fr RCPs Lvr Guide Bearing Cooler
CCM-453	ICCV from RCPs Thermal Barriers
CCM-454	ICCV from RCPs Thermal Barriers
CCM-458	ICCV to RCPs Oil Coolers and Thermal
CCM-459	ICCV to RCPs Oil Coolers and Thermal
	Barriers
ECR-31	IContainment Air Monitor
ECR-32	IContainment Air Monitor
ECR-33	IContainment Air Monitor
ECR-35	IContainment Air Monitor
ECR-36	IContainment Air Monitor
VCR-901	INESW to CLV Unit 1
VCR-905	INESW to CLV Unit 2
VCR-909	INESW to CLV Unit 3
VCR-913	INESW to CLV Unit 4
VCR-900	INESW to RCP CLV Unit 1
VCR-904	INESW to RCP CLV Unit 2
VCR-908	INESW to RCP CLV Unit 3
VCR-912	INESW to RCP CLV Unit 4
VCR-902	INESW from CLV Unit 1
VCR-903	INESW from CLV Unit 1
VCR-906	INESW from CLV Unit 2
VCR-907	INESW from CLV Unit 2
VCR-910	INESW from CLV Unit 3
VCR-911	INESW from CLV Unit 3
VCR-914	INESW from CLV Unit 4
VCR-915	INESW from CLV Unit 4
VCR-921	INESW to CUV Unit 1
VCR-925	INESW to CUV Unit 2
VCR-929	INESW to CUV Unit 3
VCR-933	INESW to CUV Unit 4
VCR-920	INESW to RCP CUV Unit 1
VCR-924	INESW to RCP CUV Unit 2
VCR-928	INESW to RCP CUV Unit 3

Plant ID	Channel
VCR-932	INESW to RCP CUV Unit 4
VCR-922	INESW from CUV Unit 1
VCR-923	INESW from CUV Unit 1
VCR-926	INESW from CUV Unit 2
VCR-927	INESW from CUV Unit 2
VCR-930	INESW from CUV Unit 3
VCR-931	INESW from CUV Unit 3
VCR-934	INESW from CUV Unit 4
VCR-935	INESW from CUV Unit 4
VCR-941	INESW to RCP 1 Air Cooler
VCR-942	INESW to RCP 2 Air Cooler
VCR-943	INESW to RCP 3 Air Cooler
VCR-944	INESW to RCP 4 Air Cooler
VCR-945	INESW from RCP 1 Air Cooler
VCR-955	INESW from RCP 1 Air Cooler
VCR-946	INESW from RCP 2 Air Cooler
VCR-956	INESW from RCP 2 Air Cooler
VCR-947	INESW from RCP 3 Air Cooler
VCR-957	INESW from RCP 3 Air Cooler
VCR-948	INESW from RCP 4 Air Cooler
VCR-958	INESW from RCP 4 Air Cooler
VCR-951	INESW to RCP 1 Air Cooler
VCR-952	INESW to RCP 2 Air Cooler
VCR-953	INESW to RCP 3 Air Cooler
VCR-954	INESW to RCP 4 Air Cooler
VCR-960	INESW to Instrant Rm Ventiltn Units
VCR-961	INESW to Instrant Rm Ventiltn Units
VCR-964	INESW to Instrant Rm Ventiltn Units
VCR-965	INESW to Instrant Rm Ventiltn Units
VCR-962	INESW fr Instrant Rm Ventiltn Units
VCR-963	INESW to Instrant Rm Ventiltn Units
VCR-966	INESW to Instrant Rm Ventiltn Units
VCR-967	INESW fr Instrant Rm Ventiltn Units
CCR-440	ICCV from Main Steam Penetration
CCR-441	ICCV from Main Steam Penetration
MCM-221	IMain Steam to Auxiliary Feed Pump
MCM-231	IMain Steam to Auxiliary Feed Pump
CCM-430	ICCV to E Pressure Equalization Fan
CCM-431	ICCV to E Pressure Equalization Fan
CCM-432	ICCV to V Pressure Equalization Fan
CCM-433	ICCV to V Pressure Equalization Fan

ATTACHMENT NO. 2 TO TYPE B VARIABLES TABLEITEM NO. B-14

Most of the valves listed in Attachment No. 1 to Type B Variables Item No. B-14 are located outside of containment and are only subject to an HELB outside of containment. Since they are not required to operate (per EOP's) in the event of an HELB, qualification is not required because they will be located in a mild environment should a Design Basis Event (DBE) occur where their use is required. Redundant indication is also not required because the valves are backed up by a second, redundant valve, also listed in Attachment No. 1.

Exceptions to the above are listed as follows:

DCR-301,302,303,304,310,320,330,340, and XCR-100,101,102,103 will be upgraded by replacing the position indication limit switches with environmentally and seismically qualified equipment. These valves are located outside of containment and are required to operate during an HELB.

The position indication limit switch for QCM-250 is located inside containment and is not qualified for a DBE inside of containment. It is, however, backed up by QCM-350 which is located outside of containment and its position indication limit switch is qualified. Should there be a DBE inside containment and QCM-250 did not indicate appropriately, QCM-350 could be used to verify isolation. In addition an operator could be dispatched to visually verify QCM-350 closure. If a DBE outside of containment should occur, QCM-350 is qualified for the adverse environment generated and could be backed up by QCM-250 which would not be subjected to the harsh environment and therefore, would be expected to indicate appropriately.

The position indication limit switches for VCR-11 and 21 are located inside containment and not qualified for a DBE inside containment. They are, however, backed up by VCR-10 and 20, respectively, which are located outside of containment. Should there be a DBE inside containment and VCR-11 or 21 did not indicate appropriately, VCR-10 and 20 can be used to verify isolation. In addition, an operator could be dispatched to visually verify closure. DBE's outside of containment will not create a harsh environment at VCR-10 and 20 locations.

CCM-451,452,453,454,458,459; CCM-430,431,432,433; and MCM-221,231 are qualified for an HELB.

VCR-101 thru 107 and 201 thru 207 are not listed in attachment 1 because their function is specifically listed in the Type D Variables Table, Item D-31.

IV. FOOTNOTES DESIGNATING EXCEPTIONS TO REGULATORY GUIDE 1.97, REV. 3

(a) The automatic injection of boric acid into the RCS by the safety injection system following a postulated LOCA/HELB will be monitored and verified through the use of qualified instrumentation. In addition, since all sources of water for the safety injection system (Accumulators, Boric Acid Storage Tanks and Refueling Water Storage Tanks) are required by Technical Specifications to contain boric acid solution of a minimum concentration, the proper operation of the ECCS system ensures an adequate boron concentration in the reactor coolant to achieve and maintain the safe shutdown of the reactor core. The RCS soluble boron content is not expected to change rapidly, if at all, following the initial borating during the SI phase of an accident. Periodic analysis of RCS samples would detect any significant changes in boron concentration. Instrumentation to continuously monitor RCS soluble boron concentration is not required since periodic analysis of RCS grab samples is adequate for verification of reactivity control.

(b) Redundancy not required per NUREG 0737 requirements.

(c) Seismic qualification not required per NUREG 0737 requirements.

(d) All equipment is located in mild environment, therefore environmental qualification is not required.

(e) Lack of lower containment spray flow monitoring instrumentation will not deter the operator's ability to determine adverse containment conditions. Adverse containment conditions can be monitored by looking at items such as containment pressure. If we see containment pressure conditions different than what is expected, then we can confirm whether adverse containment conditions are due to a lack of spray flow by the monitoring of containment spray pump discharge pressure.

(f) The neutron flux monitors are not required for LOCA/HELB mitigation, therefore their environmental qualification is not required. Following a LOCA/HELB, reactivity control to accomplish reactor shutdown is automatically achieved and maintained by a reactor SCRAM and the injection of boric acid by ECCS. This can be verified through control rod position indications and analysis of RCS grab samples. Footnote (h) is also applicable.

(g) Scheduled for upgrade as described in AEP:NRC: 0761 C.

(h) Instrumentation to continuously monitor RCS radioactivity is not required. Periodic analysis of RCS grab samples is adequate to detect deterioration of fuel cladding. Indicative of an inadequate core cooling (ICC) event, fast deterioration of fuel cladding could be detected by sensing the ICC conditions through diverse instrumentation (i.e., RVLIS, CET's, TSAT meter).

(i) Per SER issued June 16, 1981 concerning Auxiliary Feedwater System reliability, it is only required that qualification, S/G narrow range level indication be provided and backed up by qualified Auxiliary Feedwater Flow Indication. S/G wide range level indication is not required to be environmentally qualified or powered from a Class IE power source.

(j) Containment Sump Water Temperature will give none of the information required to mitigate and determine the consequences of an accident. Containment Sump Level, Atmosphere Temperature and pressure are adequate for operators to determine containment conditions. Therefore, measurement of Containment Sump Water Temperature is not required.

- (k) DELETED
- (l) INTENTIONALLY LEFT BLANK
- (m) Redundancy is accomplished by verifying pump flow from qualified instrumentation.
- (n) DELETED
- (o) INTENTIONALLY LEFT BLANK
- (p) Range is adequate to safely monitor operation.
- (q) Not required per NUREG 0737 II.B.3
- (r) These valves are left normally open (safe position), the breakers racked out and they cannot change position. Therefore, Environmental Qualification of position indication is not required.
- (s) Redundancy can be provided by VCR-101 thru 107 which are located inside containment. VCR-201 thru 207 are located outside containment.