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SUBJECT: Forwards list of Reg Guide 1.97 variables & summary of current level of qualification.

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October 24, 1988

10 CFR 50.49.b.3

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
RG 1.97 (Accident Monitoring Instrumentation)

References:
1) Letter from C. W. Giesler (WPSC) to D. G. Eisenhut (NRC) dated April 15, 1983
2) Letter from C. W. Giesler (WPSC) to D. G. Eisenhut (NRC) dated August 4, 1983
3) Letter from S. A. Varga (NRC) to C. W. Giesler (WPSC) dated June 12, 1984
4) Letter from G. E. Lear (NRC) to D. C. Hintz (WPSC) dated October 1, 1986
5) Letter from D. C. Hintz (WPSC) to G. E. Lear (NRC) dated April 15, 1987

References 1 and 2 provided the Nuclear Regulatory Commission (NRC) with a description of Wisconsin Public Service Corporation's (WPSC's) method of complying with 10 CFR 50.49.b.3. The NRC approved this methodology by order in reference 3. In reference 4 the NRC stated that this methodology was no longer acceptable and that WPSC should follow the guidance provided by Regulatory Guide 1.97 (RG 1.97). In reference 5, WPSC responded to the technical concerns raised by the NRC in reference 4. Reference 5 further stated that we were concerned with what appeared to be conflicting requirements between the June 12 order, reference 3, and reference 4; and therefore could not prudently proceed with any hardware changes.

In order to resolve this issue, representatives from WPSC met with representatives from the NRC on August 24, 1988. During this meeting WPSC agreed to provide the NRC with a list of RG 1.97 variables and identify their current level of qualification. The attachments to this letter provide the NRC with

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this information. Attachment 1 provides a list of RG 1.97 variables as they appear in Rev. 3 of RG 1.97 and a summary of their current level of qualification. Attachment 2 provides a brief description of each variable. Attachments 3 and 4 provide the ranges of the SPING units described in attachment 2. This information is provided to you to aid in your understanding of our position on this issue.

WPSC will continue to work with the staff to come to a mutually agreeable resolution, at which time a schedule for any resultant hardware modifications will be developed.

Sincerely,

C. R. Steinhardt
Manager - Nuclear Power

TJW/jms

Enc.

cc - Mr. Robert Nelson, US NRC
US NRC, Region III

Attachment 1

To The Letter

From:

C. R. Steinhardt (WPSC)

To:

The NRC Document Control Desk

Dated:

24 October 1988

Re:

RG 1.97

ATTACHMENT 1

CLARIFICATIONS

1. Column A, Item #, is a sequential number given to each instrument that appears in RG 1.97.

2. Column B, Instrument, identifies which instrument in RG 1.97 is being described. These instruments are listed in the order they appear in RG 1.97, Rev. 3.

3. Column C, Type/CAT, identifies the type and category of the instrument. If an instrument is listed more than once, it will be identified by more than one type and category.

4. Column D, Required Range, identifies the range listed in RG 1.97.

5. Column E, Actual Range, identifies the range of the corresponding instrument installed at the Kewaunee Plant. If no range is identified, please see the instrument's description in Attachment 2.

6. Column F, Dis, identifies the type of control room display, available to the operators. The following key is provided for Column F.

   1 = Real time display without recording capabilities

   2 = Real time display with recording capabilities

   3 = Computer point available to the operators on the plant process computer, with trending capabilities

   N = There is no indication in the control room

If there is no designation in Column F, please see the instrument's description in Attachment 2.

7. Column G, Red, indicates if the instrument meets Kewaunee design basis for redundancy. The following key is provided for Column G:

   Y = The instrument meets Kewaunee design basis for redundancy and separation described in section 8.2.2 of Kewaunee's USAR. Please note, Kewaunee's design basis for separation is different than that identified by RG 1.97.

   N = The instrument does not meet Kewaunee's design basis for redundancy and separation.

   NA = RG 1.97 does not require redundancy.

If there is no designation in Column G, please see the instrument's description in Attachment 2.

8. Column H, PS, identifies the source of the instrument's power. The following key is provided for Column H:

   1 = The instrument receives power from a safety-related bus with either battery or diesel generator backup.

   2 = The instrument receives power from a non-safety related bus but has either battery or diesel generator backup.

   3 = The instrument is supplied by non-safety related offsite power.

If there is no designation in column H, please see the instrument's description in Attachment 2.

9. Column I, EQ, identifies the instruments level of environmental qualification. The following key is provided for Column I:

   Y = The instrument has been environmentally qualified by WPSC's approved environmental qualification program.

   N = The instrument has not been environmentally qualified by WPSC's environmental qualification program.

   NA = RG 1.97 does not require environmental qualification.

If there is no designation in Column I, please see the instrument's description in Attachment 2.

10. Column J, SQ, identifies the instrument's level of seismic qualification. The following key is provided for Column J:

    Y = The instrument meets Kewaunee's design basis for seismic qualification.

    N = The instrument does not meet Kewaunee's design basis for seismic qualification.

    NA = RG 1.97 does not require seismic qualification.

If there is no designation in Column J, please see the instruments description in Attachment 2.

11. Attachment 2 provides clarifications or justifications from RG 1.97 for each instrument listed in Attachment 1.

12. Instruments identified in attachments 1 and 2 presently meet Kewaunee's design basis for operation.

A Item #	B Instrument	C Type/Cat.	D Required Range	E Actual Range	F Dis	G Red	H PS	I EQ	J SQ
1	Neutron Flux	B1	10^{-6}% to 100%	10^{-9}% to 100%	1,2	Y	1	N	N
2	Control Rod Position	B3	Full In or not Full In	0 to 228 steps	1	NA	1	NA	NA
3	RCS Boron Concentration	B3	0 to 6000 ppm	0 to 2000	1	NA	3	NA	NA
4	RCS Cold Leg Temp	B3, B1	50°F to 700°F	50°F to 650°F	2	N	1	Y	Y
5	RCS Hot Leg Temp	B1	50°F to 700°F	50°F to 650°F	2	N	1	Y	Y
6	RCS Pressure	B1, C1	0 to 3000 psig	0 to 3000 psig	1,2	Y	1	Y	
7	Core Exit Temp	B3, C1	200°F to 2300°F	Ref. to 2300°F	1	Y	1	Y	Y
8	Coolant Inventory	B1	Bottom of hot leg to Top of Vessel	Bottom of Hot Leg to Top of Vessel	1,2	Y	1	Y	
9	Degrees of Subcooling	B2	200°F to -35°F		1	NA	1	Y	NA
10	Cntmt Sump Water Level								
	Narrow Range	B2, C2	Plant Specific	0 to 22 ft	1,3	Y	1	Y	Y
	Wide Range	B1, C1	0 to 16.5 ft	0 to 22 ft	1,3	Y	1	Y	Y
11	Cntmt Pressure								
	0 to Design	B1	0 to 46 psig	-5 to 200 psig	2	Y	1	Y	Y
	-5 to Design	B1, C1	-5 psig to 46 psig	-5 to 200 psig		Y	1	Y	Y
	-5 to 4 x Design	C1	-5 psig to 184 psig	-5 to 200 psig		Y	1	Y	Y
12	Cntmt Isolation Valve Position	C1	closed/not closed	closed/not closed	1	Y	1	Y	N
13	Radioactivity Conc. in Primary Coolant	C1	½ Tech Spec limit to 100 x Tech Spec limit	1D µCi/ml to 10 Ci/ml					
14	Analysis of Primary Coolant (Gamma Spectrum)	B3	10 µCi/ml to 10 Ci/ml	10 µCi/ml to 10 Ci/ml		NA	3	NA	NA

A Item #	B Instrument	C Type/Cat.	D Required Range	E Actual Range	F Dis	G Red	H PS	I EQ	J SQ
15	Cntmt Area Radiation	C3, E1	1 R/hr to 10^7 R/hr	1 R/hr to 10^8 R/hr	2	N	1	Y	Y
16	Condenser Exhaust Radiation	C3	$10^{-6}\mu Ci/cc$ to $10^{-2}\mu Ci/cc$			NA	1	NA	NA
17	Cntmt Hydrogen Con	C1	0% to 10%	0% to 10%	1	Y	1	Y	Y
18	Cntmt Effluent Rad	C2	$10^{-6}\mu Ci/cc$ to $10^{-2}\mu Ci/cc$			NA	1	Y	NA
19	Effluent Rad from Bldg	C2	$1D-^{6}\mu Ci/cc$ to $10^{3}\mu Ci/cc$			NA	1	Y	NA
20	RHR System Flow	02	0 to 4400 gpm	0 to 6000 gpm	1	NA	1	Y	NA
21	RHR Hx Outlet Temp	D2	40°F to 350°F	100°F to 400°F	2	NA	1	N	NA
22	Accumulator Tank Level	D2	10% to 90%	59% to 68%	1	NA	1	N	NA
23	Accumulator Tank Pressure	D2	0 to 750 psig	0 to 800 psig	1	NA	1	N	NA
24	Accumulator Isolation Valve Position	D2	closed/open	closed/open	1	NA	1	N	NA
25	Boric Acid Charging Flow	02	0 to 132 gpm	0 to 110 gpm	1	NA	1	N	NA
26	Flow in HPI System	D2	0 to 1540 gpm	0 to 1500 gpm	1	NA	1	N	NA
27	Flow in LPI System	D2	0 to 2200	0 to 3000 gpm	1	NA	1	N	NA
28	Refueling Water System Tank	D2	Top to bottom	1% to 100%	1	NA	1	Y	NA
29	Reactor Coolant Pump Status	D3	Motor Current	0 to 1200 amp	1	NA	3	NA	NA
30	Primary System Safety Position	D2	closed/not closed	closed/not closed	1	NA	1	N	NA
31	Primary PORV Position	D2	closed/not closed	closed/not closed	1	NA	1	Y	NA

A Item #	B Instrument	C Type/Cat.	D Required Range	E Actual Range	F Dis	G Red	H PS	I EQ	J SQ
32	Pressurizer Level	D1	Top to bottom	0 to 100%	1,2	Y	1	Y	Y
33	Pressurizer Heater Status	D2	Electric Current	on/off	1	NA	2	Y	NA
34	Quench Tank Level	D3	Top to Bottom	3% to 99%	1	NA	1	NA	NA
35	Quench Tank Temp	D3	50°F to 750°F	0 to 30D°F	1	NA	1	NA	NA
36	Quench Tank Press	D3	0 to 100 psig	0 to 50 psig	1	NA	1	NA	NA
37	SG Level	D1	Tube Sheet to Separators	U Tube to Separators	1,2	Y	1	Y	Y
38	SG Pressure	D2	0 psig to 1290 psig	0 psig to 1400 psig	1,2	Y	1	Y	Y
39	Main Steam Flow	D2	0 to 4.5 MPPH	0 to 4.5 MPPH	1,2	NA	1	Y	NA
40	Main Feedwater Flow	D3	0 to 4.5 MPPH	0 to 4.5 MPPH	1,2	NA	1	NA	NA
41	Auxiliary Feedwater Flow	D2	0 to 396 gpm	0 to 500 gpm	1	NA	1	Y	NA
42	Condensate Storage Tank Level	D1	Plant Specific	2.4% to 100%	1		1		
43	Containment Spray Flow	D2	0 to 1430 gpm		1	NA			NA
44	Heat Removal by Cntmt Fan Heat Removal Sys	D2	Plant Specific		1	NA	1	Y	NA
45	Cntmt Atmos Temp	D2	40°F to 400°F	20°F to 385°F		NA	1	Y	NA
46	Cntmt Sump Water Temperature	D2	50°F to 250°F			NA			NA
47	Makeup Flow In	D2	0 to 115.5 gpm	0 to 110 gpm	1	NA	1	N	NA

A Item #	B Instrument	C Type/Cat.	D Required Range	E Actual Range	F Dis	G Red	H PS	I EQ	J SQ
48	Letdown Flow Out	D2	0 to 88 gpm	0 to 120 gpm	1	NA	1	N	NA
49	VCT Tank Level	D2	Top to Bottom	10.78% to 89.22%	1	NA	1	N	NA
50	Component Cooling Water Temp to ESF Equipment	D2	40°F to 200°F	50°F to 200°F	1,3	NA	1	N	NA
51	Component Cooling Water Flow to ESF Equipment	D2	0 to 8030 gpm	0 to 8000 gpm	1	NA	1	Y	NA
52	High Level Rad Liquid Tank Level	D3	Top to Bottom	6.6% to 99.7%		NA	1	NA	NA
53	Radioactive Gas Holdup Tank Pressure	D3	0 to 225 psig	0 to 150 psig		NA	1	NA	NA
54	Emergency Ventilation Damper Position	D2	open/closed	open/closed	1	NA	1/2	Y	NA
55	Status of standby Power	D2	Plant Specific		1	NA	1	Y	NA
56	Rad Exposure Rates Inside Bldg	E3	10^{-1} R/hr to 10^{4} R/hr		3	NA	3	NA	NA
57	Cntmt or Purge Effluent (Noble Gases)	E2	10^{-6} μCi/cc to 10^{5} μCi/cc			NA	1	Y	NA
58	Reactor Shield Bldg Annulus (Noble Gases)	E2	10^{-6} μCi/cc to 10^{4} μCi/cc			NA	1	Y	NA
59	Auxiliary Bldg (Noble Gases)	E2	10^{-6} μCi/cc to 10^{3} μCi/cc			NA	1	Y	NA
60	Condenser Air Exhaust (Noble Gases)	E2	10^{-6} μCi/cc to 10^{5} μCi/cc			NA	1	Y	NA

A Item #	B Instrument	C Type/Cat.	D Required Range	E Actual Range	F Dis	G Red	H PS	I EQ	J SQ
61	Common Plant or Multi Purpose Vent Discharge of Noble Gases	E2	10^{-6} µCi/cc to 10^{3} µCi/cc			NA	1	Y	NA
62	Vent From SG (Noble Gases)	D2	10^{-1} µCi/cc to 10^{3} µCi/cc	10^{-1} mr/hr to 10^{7} mr/hr	2	NA	1		NA
63	All Other Identified Noble Gas Release Points	D2	10^{-6} µCi/cc to 10^{2} µCi/cc			NA	1	Y	NA
64	All identified Release Points of Particulates and Halogens	D2	10^{-3} µCi/cc to 10^{2} µCi			NA	1	Y	NA
65	Airborne Radio Halogens and Particulates (Portable Sampling)	E3	10^{-9} µCi/cc to 10^{-3} µCi/cc	10^{-9} Ci/cc to 10^{-3} µCi/cc	N	NA	3	NA	NA
66	Plant and Environs. Radiation (Portable Instruments)	E3	10^{-3} R/hr to 10^{4} R/hr photons 10^{-3} R/hr to 10^{4} R/hr beta and low energy photons.	10^{-3} R/hr to $2x10^{4}$ R/hr photon 10^{-3} R/hr to $2x10^{4}$ R/hr Beta and low energy photons.	N	NA	3	NA	NA
67	Plant and Environ. Radioactivity (Portable Instruments)	E3	Isotopic Analysis	Isotopic Analysis	N	NA	3	NA	NA
68	Wind Direction	E3	0° to 360°	0° to 360°	3	NA	3	NA	NA
69	Wind Speed	E3	0 to 50 mph	0 to 50 mph	3	NA	3	NA	NA
70	Estimate of Atmospheric Stability	E3	-9°F to 18°F	-5°F to 10°F	3	NA	3	NA	NA

A Item #	B Instrument	C Type/Cat.	D Required Range	E Actual Range	F Dis	G Red	H PS	I EQ	J SQ
71	Primary Coolant and Sump	E3			N	NA	3	NA	NA
	• Gross Activity		1 μCi/ml to 10 Ci/ml	1 μCi/ml to 10 Ci/ml					
	• Gamma Spectrum		Isotopic Analysis	Isotopic Analysis					
	• Boron Content		0 to 6000 ppm	.2 ppm to 6000 ppm					
	• Chloride Content		0 to 20 ppm	.05 to 20 ppm					
	• Dissolved H_2		0 to 2000 cc/kg	6 cc/kg to 1800 cc/kg					
	• Dissolved O_2		0 to 20 ppm	.1 ppm to 20 ppm					
	• pH		1 to 13	1 to 13					
72	Containment Air	E3			N	NA	3	NA	NA
	• Hydrogen Content		0 to 10%	0 to 10%					
	• Oxygen Content		0 to 30%	0 to 30%					
	• Gamma Spectrum		Isotopic Analysis	Isotopic Analysis					

Attachment 2

To The Letter

From: C. R. Steinhardt (WPSC)

To: The NRC Document Control Desk

Dated:

24 October 1988

Re:

RG 1.97

1. Neutron Flux: A schedule to install an instrument which meets Kewaunee's design basis for environmental and seismic qualification will be submitted following resolution of the remaining questions surrounding WPSC's RG 1.97 methodology.

2. Control Rod Position: This instrument meets all the requirements specified by RG 1.97.

   However, a review of the emergency response procedures and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

3. RCS Boron Concentration: The Calibrated range of this instrument is 0 to 2000 ppm. In addition, to the on-line monitor, Kewaunee has the ability take manual samples and analyze them in-house. This instrument meets the remaining RG 1.97 requirement.

   However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

4. RCS Cold Leg Temperature: There are two RCS cold leg temperature monitors one for each RCS loop, installed at the Kewaunee plant. The range of the instrument (0-650°F) is less than that required by RG 1.97 (0-700°F). Since normal operating temperature is approximately 530°F, the present range is sufficient. Temperatures greater than 650°F would indicate saturated or superheated conditions. Under these conditions the core exit thermocouples would provide a more accurate indication of core temperature.

   The instruments are environmentally and seismically qualified and receive power from separate safety related battery backed buses. However, they do not meet Kewaunee's design basis for redundancy. A schedule to resolve this discrepancy will be submitted following resolution of the remaining questions surrounding WPSC's RG 1.97 methodology.

5. RCS Hot Leg Temperature: There are two RCS hot leg temperature monitors, one for each RCS loop, installed at the Kewaunee plant. The range of the instrument (0-650°F) is less than that required by RG 1.97 (0-700°F). Since normal operating temperature is approximately 590°F, the range is sufficient. Temperatures greater than 650°F would indicate saturated or superheated conditions. Under these conditions the core exit thermocouples provide a more accurate indication of core temperature.

   The instruments are environmentally and seismically qualified and receive power from separate safety related battery backed buses. However, they do not meet Kewaunee's design basis for redundancy. A schedule to resolve this discrepancy will be submitted to the NRC following the resolution of the remaining RG 1.97 issues.

6. RCS Pressure: There are two RCS pressure monitors installed at the Kewaunee plant. The monitors meet Kewaunee's design basis for redundancy and have been environmentally qualified. The seismic adequacy of these monitors is presently under review. If it is found to be inadequate, a schedule to resolve the discrepancy will be submitted to the NRC following resolution of the remaining RG 1.97 methodology issues.

   The monitors receive power from a safety related battery backed bus.

7. Core Exit Temperature. The design of this instrument has been previously reviewed and approved by the NRC as a result of their review of WPSC's response item II.F.2 of NUREG 0737.

8. Coolant Inventory: The seismic adequacy of the instrument is presently under review. If it is found to be inadequate, a schedule to resolve the discrepancy will be submitted to the NRC following resolution of the remaining RG 1.97 methodology issues.

   The design of this instrument has been previously reviewed and approved by the NRC as a result of their review of item II.F.2 of NUREG 0737.

9. Degrees of Subcooling: Subcooling is a calculated variable based on core exit temp (cntmt temp to 2300°F) and RCS pressure (0 to 3000 psig). The design of this instrument has been previously reviewed and approved by the NRC as a result of their review of WPSC's response to item II.F.2 of NUREG 0737.

   However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

10. Containment Sump Water Level (Wide and Narrow Range): The wide and narrow range containment water level monitors at Kewaunee measure over the same span. All operator actions associated with sump level are based on the wide range monitors, there are no automatic actuations associated with sump level. Therefore, the wide range level indication fulfills the intent of wide and narrow range monitors. The design the monitor has been previously reviewed and approved by NRC as a result of WPSC's response to item II.F.1.5 of NUREG 0737.

11. Containment Pressure: A review of the emergency operating procedures and the emergency response guidelines has determined that the operators and the shift technical advisor need a containment pressure monitor with range of 0 psig to 46 psig (design pressure). A 0 psig to 60 psig is installed for this purpose. A instrument range greater than this is not required to monitor the course of an accident.

    However, as part of NUREG 0737, item II.F.1.4, two monitors with a range of a -5 psig to 200 psig have been installed at Kewaunee. The NRC has reviewed and accepted the design of these monitors as a result of their review of item II.F.1.4 of NUREG 0737.

12. Containment Isolation Valve Position Indication: The following is a list of containment isolation valves and their present level of qualification.

a. Containment	Valve	PS	EQ	SQ
	AS-1	1	Y	Y
	AS-2	1	Y	Y
	AS-32	1	Y	Y
	CVC-54	1	Y	Y
	MD(R)-323(A)	1	Y	Y
	MD(R)-323(B)	1	Y	Y
	VB-10A	1	Y	Y
	VB-10B	1	Y	Y
	WG-311	1	Y	Y
	WG-310	1	Y	Y

b. CVC Letdown	Valve	PS	EQ	SQ
	LD-4A	1	Y	Y
	LD-4B	1	Y	Y
	LD-4C	1	Y	Y
	LC-6	1	Y	Y

c. Excess Letdown	Valve	PS	EQ	SQ
	CC-653	1	Y	Y

d. ICS	Valve	PS	EQ	SQ
	ICS-201	1	Y	N
	ICS-202	1	Y	N

e. RXCP	Valve	PS	EQ	SQ
	CVC-211	1	Y	Y
	CVC-212	1	Y	Y

f. Primary Sampling	Valve	PS	EQ	SQ
	RC-403	1	Y	Y
	RC-402	1	Y	Y
	RC-413	1	Y	Y
	RC-412	1	Y	Y
	RC-422	1	Y	Y
	RC-423	1	Y	Y

g. Purge and Vent	Valve	PS	EQ	SQ
	RBV-1	1	Y	Y
	RBV-2	1	Y	Y
	RBV-3	1	Y	Y
	RBV-4	1	Y	Y

h. PRT	Valve	PS	EQ	SQ
	MG(R)-513	1	Y	Y
	MG(R)-512	1	Y	Y
	NG-302	1	Y	N
	MU-1010-1	1	Y	Y

i. RCDT	Valve	PS	EQ	SQ
	MG(R)-510	1	Y	Y
	MG(R)-509	1	Y	Y
	MG(R)-504	1	Y	Y
	MG(R)-503	1	Y	Y
	RC-508	1	Y	Y
	RC-507	1	Y	Y

j. Steam Generator	Valve	PS	EQ	SQ
	BT-2A	1	Y	Y
	BT-2B	1	Y	Y
	BT-3A	1	Y	Y
	BT-3B	1	Y	Y
	BT-31A	1	Y	Y
	BT-31B	1	Y	Y
	BT-32A	1	N	N
	BT-32B	1	N	N

k. Sump A	Valve	PS	EQ	SQ
	MD(R)-134	1	Y	Y
	MD(R)-135	1	Y	Y

l. SI Accumulators	Valve	PS	EQ	SQ
	NG 107	1	N	N

Valves CC-653 and CVC-212 are environmentally qualified as type H3. This means that:

1. The valves will fulfill their safety related function before the environment becomes harsh,

2. The valves will not reposition as a result of a harsh environment,

3. A loss of indication will not mislead the operator,

4. The valves are not required to be repositioned in a harsh environment, and

5. The failure of the valves will not affect other safety related equipment.

All the valves have position indication in the control room. However, position indication is not available in the TSC or EOF. A schedule to upgrade the limit switches for valves ICS-201, ICS 202, NG-302, BT-32A, BT-32B, and NG-107 will be provided after the remaining issues surrounding WPSC's RG 1.97 methodology have been resolved.

13. Radioactivity Concentration in the Primary Coolant. This function is performed by the chemistry department. A manual sample is taken and analyzed in-house. The samples are taken in the high radiation sample room (HRSR), which was installed as a result of item II.B.3 of NUREG 0737. The NRC has reviewed and approved the design of the HRSR and Kewaunee's analysis capabilities.

    The TS limit on primary activity (A) is given by the equation $A = 91/\bar{E}$, where $\bar{E}$ is the sum of Beta and Gamma energies.

    A review of the emergency response procedures and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

    This is the same equipment described by item 71.

14. Analysis of Primary Coolant: This variable is the same as item 71.

15. Containment Area Radiation: The design of this equipment has been previously reviewed and approved by the NRC in accordance with Item II.F.1.4 of NUREG-0737.

16. Condenser Exhaust Radiation: Radioactive Exhaust from the condensor are discharged through the auxiliary building stack, please see item 59.

17. Containment Hydrogen Concentration: Two containment hydrogen monitors have been installed at the Kewaunee plant. They are enviromentally and seismically qualified and receive power from separated safety related deisel generator backed buses. The monitors meet separation requirements from the sampler until the remote panel, which is considered the primary indicator of containment hydrogen concentration.

    The NRC has reviewed and approved the design of this system in accordance with Item II.F.1.6 of NUREG-0737.

18. Containment Effluent Radioactivity: Releases from the containment and the shield building are vented through a common vent and are monitored by a SPING unit located in a mild post accident environment. Displays for this equipment are located in Kewaunee's radiological assessment facility and in the radiation protection office. The range of the instrument is supplied in attachment 3. The unit is powered by a safety related diesel backed bus.

    Flow rates through the shield building vent are not directly measured at Kewaunee. However, flow rates through the vent for different fan configurations have been determined and will be used to quantify release rates from the vent.

    The design of this system has been reviewed and approved by the NRC as a result of the NRC's review of WPSC's response to item II.F.1.

However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

19. Effluent Radioactivity From Buildings: There are only two release vents at the Kewaunee plant. They are the containment/shield building vent, described by item 18, and the auxiliary building vent, described by item 59.

20. RHR System Flow: An environmentally qualified instrument which is supplied with power from a battery backed safety related bus is installed at the Kewaunee plant.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

21. RHR Hx Outlet Temperature: The range for this instrument (100°F to 400°F) is less than that required by RG 1.97 (40°F to 350°F). However, at 140°F the Kewaunee Plant is in refueling shutdown. Therefore, indication of temperature less than 100°F are unnecessary.

    The instrument is not environmentally qualified; however, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, the instrument does not require environmental qualification under 10 CFR 50.49 (b)(3).

    The instrument receives power from a safety related battery backed bus.

22. Accumulator Tank Level: The existing range is sufficient to ensure compliance with Kewaunee's Technical Specifications. Since this is a passive safety system; i.e., the operators can not control its level during or following an accident, the range is sufficient to ensure that the accumulators function properly.

    The instrument is not environmentally qualified; however, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, environmental qualification is not required under 10 CFR 50.49(b)(3) to ensure proper operation of the accumulator.

23. Accumulator Tank Pressure: This is a passive safety device, i.e., the operators cannot control accumulator pressure during or following an accident. Furthermore, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, it does not require environmental qualification under 10 CFR 50.49(b)(3).

24. Accumulator Isolation Valves: These valves are opened and two operators independently verify that the valves are open prior to the plant reaching 1000 psig during plant startup. The power to the valves is then removed and the breaker is padlocked in the open position. Therefore, the valves will not reposition during or following an accident and do not require environmental qualification under 10 CFR 50.49(b)(3).

    The valves receive power from a safety related diesel backed bus. The power for the valves' position indication comes from a safety related battery backed bus.

25. Boric Acid Charging Flow: This variable is identical to Makeup Flow In. Please see item 47.

26. Flow in the HPI System: A flow meter with a range of 0 to 1500 gpm is installed on the HPI system at Kewaunee. This instrument is not environmentally qualified. However, the emergency operating procedures do not require the operators to verify a minimum or maximum flow rate. Therefore, the following provides adequate indication of HPI performance.

    a. safety injection pump breaker position indication,

    b. safety injection pump motor current,

    c. position indication for the following safety injection valves.

Valve	Motor Operator	EQ
RHR-300A	32134	Y
RHR-300B	32135	Y
SI-2A	32104	Y
SI-2B	32105	Y
SI-4A	32109	Y
SI-4B	32110	Y
SI-5A	32107	Y
SI-5B	32108	Y
SI-9A	32094	N
SI-11A	32092	N
SI-11B	32097	N
SI-208	32131	Y
SI-209	32130	Y
SI-300A	32111	Y
SI-300B	32112	Y
SI-302A	32100	Y
SI-302B	32101	Y
SI-350A	32102	Y
SI-350B	32103	Y
SI-351A	32113	Y
SI-351B	32114	Y

The safety injection pump breakers are in a mild post-accident environment and, therefore, do not require environmental qualification. The breaker position indicator receives power from a safety related battery backed bus.

Valves SI-9A, SI-11A and SI-11B are not environmentally qualified. However, the valves are opened and the valve breakers are locked open prior to the plant going critical. Therefore, they do not require environmental qualification.

Valves RHR-300A(B), SI-2A(B), SI-4A(B), SI-5A(B), SI-208, SI-209, and SI-300A(B) are environmentally qualified as type H3. This means that:

1. The valves will fulfill their safety related function before the environment becomes harsh,

2. The valves will not reposition as a result of a harsh environment,

3. A loss of indication will not mislead the operators,

4. The valves are not required to reposition in a harsh environment, and

5. The failure of the valves will not affect other safety related equipment.

The position indication for valves SI-9A, SI-11A and SI-11B receives power from a safety related battery backed bus. The remaining valves receive power from a safety related diesel backed bus.

27. Flow in the LPI System: A non-environmentally qualified LPI flow meter with a range of 0 to 3000 gpm is installed at the Kewaunee plant. Since the emergency operating procedures do not require the operators to verify a minimum or maximum flow, the following provide adequate indication of LPI performance.

    a. residual heat removal pump breaker position,

    b. residual heat removal pump motor current,

    c. position indication for the safety injection valves identified in item 26.C.

    The breakers for the residual heat removal pumps are located in a mild post-accident environment and, therefore, do not require environmental qualification. The breaker position indicators receive power from safety related battery backed buses.

28. Refueling Water Storage Tank Level: This instrument is environmentally qualified and receives power from a safety related battery backed bus.

29. Reactor Coolant Pump Status: This instrument meets the requirements of RG 1.97.

30. Primary System Safety Valve Position: These valves provide a passive relief path for the RCS during over pressure conditions. The operators can not open, close or isolate these valves.

    If they open, RCS pressure would decrease indicating a fault in the primary system. The operators would correctly respond to this event in the same manner as a LOCA. (There are no automatic functions associated with valve position.) A review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift

technical advisor would require this instrument during or following an accident. Therefore, the instrument does not require environmental qualification under 10 CFR 50.49(b)(3).

The key indication of valve position is RCS pressure, item 6.

31. Primary System PORV Position Indication: This instrument is environmentally qualified and is powered from a safety related battery backed bus.

32. Pressurizer Level: This instrument presently meets Kewaunee's design basis, seismic qualification, redundancy, safety related power supply and is environmentally qualified.

33. Pressurizer Heater Status: Kewaunee's Technical Specifications require that one group of heaters (group A) receive power from a safeguards bus.

    The operators have indication of heater breaker position; they do not have indication of heater amperage. Group A heaters are not variable heaters, they are either on or off. Heater current can not be controlled manually or automatically except for turning them on or off manually. Therefore, breaker position supplies the operators with sufficient information of heater status.

    The breaker has been located in a mild environment and therefore does not require environmental qualification.

34. Quench Tank Level: At Kewaunee the quench tank is called the pressurizer relief tank (PRT). The level instrumentation for this tank meets the requirements of RG 1.97. However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

35. Quench Tank Temperature: At Kewaunee the quench tank is called the pressurizer relief tank (PRT). The range of this instrument is acceptable since primary fluid throttled through the safeties or PORV will have a temperature less than 300°F. However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

36. Quench Tank Pressure: At Kewaunee the quench tank is called the pressurizer relief tank (PRT). The range of the instrument (0 to 50 psig) is sufficient for normal plant operation.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

37. Steam Generator Level: The steam generator narrow range level monitor meets Kewaunee's design basis seismic qualification, redundancy, safety related power supply and are environmentally qualified. Their range covers the span from the U bend to the moisture separators.

The steam generators wide range level monitors (from the tube sheet to the moisture separators) do not meet Kewaunee's design basis for redundancy, seismic qualification, and are not environmentally qualified. However, the wide range monitors are only required during a loss of all feedwater event. When the level drops below 10% on the wide range scale, the operators are required to initiate feed and bleed.

However, if the environment becomes harsh, the operators are directed by the procedure to monitor RCS pressure (item 6) and RCS hot leg temperature (item 5) to determine when to initiate feed and bleed. Therefore, the key indication of a loss of heat sink are RCS pressure and hot leg temperature for harsh environments.

The instrument receives power from a safety related battery backed bus.

38. SG Pressure: This instrument meets Kewaunee's design basis for a safety related power supply and is environmentally qualified.

39. Main Steam Flow: This instrument has been environmentally qualified and receives power from a safety related battery backed bus.

40. Main Feedwater Flow: This instrument meets the requirements of RG 1.97.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

41. Auxiliary Feedwater Flow: This instrument is located in a mild environment and receives power from a battery backed safety related bus.

42. Condensate Storage Tank Level: A condensate storage tank level monitor is installed at the Kewaunee plant and it receives power from a safety related battery backed bus. It is located in a mild post-accident environment and therefore does not require environmental qualification.

    However, the safety related source of auxiliary feedwater is the service water system. Key indication of service water flow to the auxiliary feedwater pumps is:

    a. Service water pump breaker position and pump motor current and

    b. Position indication for the service water supply valve to the auxiliary feedwater pump (Valves SW-601A, SW-601B, SW-502)

    The breaker position for the service water pumps and pump motor current indication meet Kewaunee's design basis for redundancy and seismic qualification. The breaker and the pump are located in a mild post accident environment and, therefore, do not require environmental qualification. The breaker position indicators receive power from safety related battery backed bus.

Service water valves SW-601A and SW-601B, service water supply valves to the auxiliary feedwater (AFW) motor driven pumps, meet Kewaunee's design basis for redundancy and seismic qualification. They are located in a mild post accident environment and receive power from a safety related diesel generator backed bus.

Service water valve SW-502, service water supply valve to the turbine driven AFW pump, meets Kewaunee's design basis for redundancy and seismic qualification. It is located in a mild post accident environment and receives power from a safety related battery backed bus.

However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

43. Containment Spray Flow: The key indicators of containment spray flow are:

    a. Internal containment spray pump breaker position indication

    b. Position indication for the following valves

Valves	Motor Operator	EQ
ICS-5A	32066	Y
ICS-5B	32068	Y
ICS-6A	32067	Y
ICS-6B	32069	Y
RHR-400A	32125	Y
RHR-400B	32126	Y

The internal containment spray pumps are environmentally qualified. The breakers are located in a mild post-accident environment and, therefore, do not require environmental qualification. The breaker position indicators receive power from a safety related battery backed bus.

The valves listed above are environmentally qualified and receive power from a safety related diesel generator backed bus.

44. Heat removal by Containment Fan Heat Removal System: The key indication Kewaunee uses for this function are:

    a. Service water pump breaker position and pump motor current

    b. Containment fan coil unit (FCU), and

    c. Position indication for the service water discharge valves from the containment FCU.

The service water pump breaker and pump are located in mild post accident environment The breaker position indicators receives power from a safety related battery backed bus.

The containment FCU are environmentally qualified and receive power from a safety related diesel generator backed bus.

The service water supply valves (SW-903A, SW-903B, SW-903C and SW-903D) are environmentally qualified. The valves have been EQ typed H3. This means that:

1. The valves will fulfill their safety related function before the environment becomes harsh,

2. The valves will not reposition as a result of the harsh environment,

3. Loss of valve position indication will not mislead the operators,

4. The valves are not required to reposition in a harsh environment, and

5. The failure of the valves will not adversely affect other safety related equipment.

The valves receive power from a safety related diesel generator backed bus.

45. Containment Atmosphere Temperature: The design temperature of Kewaunee's containment is 268°F. Furthermore, the saturation temperature for 184 psig (4 x containment design pressure, item 11) is 382°F. Therefore, the present range is acceptable. The instrument provides indication of containment temperature in the plants technical support center. The instrument is environmentally qualified and is powered by a safety related battery backed bus.

    Indication of containment temperature is available in the control room; however, these instruments are not environmentally qualified.

46. Containment Sump Water Temperature: This instrument does not exist at the Kewaunee plant. However, a similar instrument, RHR HX inlet temperature, does exist and is displayed on a recorder in the control room. It has a range of 50°F to 450°F and receives power from a battery backed safety related bus. This instrument is not environmentally qualified.

    A review of the emergency response guideline and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, the instrument does not require environmental qualification under 10 CFR 50.49(b)(3).

47. Makeup Flow In: The existing range of this instrument (0-110 gpm) is less than that required by RG 1.97 (0 to 115.5 gpm). However, the makeup pumps are reciprocating positive displacement pumps and therefore unlikely to exceed their design flow rate of 105 gpm.

    The makeup system is not a safety related system and the makeup pumps are not part of the safety injection system. During an event requiring safety injection, the makeup pumps are automatically tripped and can only be restarted manually. Furthermore, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, makeup flow indication does not require environmental qualification under 10 CFR 50.49(b)(3).

    The monitor receives power from a safety related battery backed bus.

48. Letdown Flow Out: Letdown is not a safety related system and is automatically isolated by a containment isolation signal (see item 12.b, CVC letdown Isolation Valve Position Indication). Futhermore, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, the instrument does not require environmental qualification under 10 CFR 50.49(b)(3).

    The instrument receives power from a safety related battery backed bus.

49. Volume Control Tank Level: The tank has a hemispherical top and bottom. The range of the instrument covers a volume of approximately 11% to 89% which is sufficient for all modes of normal operation.

    The tank is part of the chemical and volume control system and therefore not safety related. Since the safety injection pumps are part of separate safety related system they never take suction from the volume control tank. Furthermore, a review of the emergency response procedures and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, the instrument does not require environmental qualification under 10 CFR 50.49(b)(3).

    The level transmitters receive power from a safety related battery backed bus.

50. Component Cooling Water Temperature to ESF Equipment: This equipment does not exist at the Kewaunee plant. However, a comparable instrument, component cooling water pump discharge temperature does exist. Its range of 50°F to 200°F is comparable to that required by RG 1.97. The instrument receives power from a safety related battery backed bus. However, it is not environmentally qualified.

    The component cooling water system is a closed loop system which cools potentially radioactive components during normal and upset conditions. There are no automatic or manual action based on component cooling water temperature. Futhermore, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident. Therefore, the instrument is not required to be environmentally qualified under 10 CFR 50.49(b)(3).

51. Component Cooling Water Flow to ESF Equipment: This instrument does not exist at the Kewaunee plant. However, a comparable instrument, component cooling water total flow, is installed at Kewaunee. The instrument is located in a mild post accident environment and therefore does not require environmental qualification. It receives power from a battery backed safety related bus.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

52. High Rad Liquid Tank Level: This tank is called the reactor coolant drain tank (RCDT) at Kewaunee. The control room operators are alerted to problems with the tank by an annunciator in the control room. When the annunciator alarms, an operator is sent to the local panel to investigate. The instrument meets the remaining requirements of RG 1.97.

    However, a review of the emergency response procedures and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

53. Radioactive Gas Holdup Tank Pressure: The control room operators are alerted to problems with the tank by an annunciator in the control room. An operator is then sent to investigate the problem at a local panel. The range of local monitor (0 to 150 psig) is less than that required by RG 1.97 (0 to 225 psig). However, there is a relief valve on the tank set at 150 psig, therefore the present range is acceptable. The instrument meets the remaining requirement specified by RG 1.97.

54. Emergency Ventilation Damper Position: The Damper in the control room and the Technical Support Center are located in a mild post accident environment and therefore do not require environmental qualification.

    The dampers in control room receive power from a safety related battery backed bus. The dampers in the technical support center are powered by a battery back highly reliable bus that is not safety related.

55. Status of Standby Power: The two safety related standby power sources at Kewaunee are:

    a. the Diesel generators (DG) and

    b. the DC batteries.

    The key indication of DG performance is safeguards bus voltage. There are two safeguard bus voltmeters, one per safeguards bus. They have a range of 0 to 5000 volts, nominal voltage is 4160 volts. The buses are located in a mild post accident environment; therefore, they do not require environmental qualification.

    The operators are alert to problems with the batteries by the following annunciators:

    125 VDC LO VOLT
    CKT BKR TRIP
    LOSS OF AC VOLT
    HI-DC VOLT AC TRIP
    LOSS OF DC VOLT
    GROUND DETECTION ALARM

    These alarms are associated with the battery chargers and the DC distribution cabinets.

The annunciators and battery chargers are located in a mild post accident environment; therefore, they do not require environmental qualification. The DC distribution cabinets are EQ type M for a mild post accident environment. The annunciators are powered by a safety related battery backed bus.

However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require the status of the batteries during or following an accident.

56. Radiation Exposure Rates Inside Buildings: The ranges of the instruments vary from area to area depending on the expected dose for the area. The areas monitored and their associated ranges are supplied in attachment 4.

57. Containment or Purge Effluent: This item is identical to item 18.

58. Reactor or Shield Building Annulus: This item is identical to item 18.

59. Auxiliary Building Vent: Releases from the auxiliary building are vented through the auxiliary building stack and are monitored by a SPING unit located in a mild post accident environment. Displays for this equipment are located in Kewaunee's radiological assessment facility and in the radiation protection office. The unit is powered by a safety related diesel generator backed bus. The ranges for the instrument are supplied in attachment 3.

    The flow rate through the stack is not directly monitored. However, flow rates for different fan configurations have been determined and will be used to quantify any release.

    The design of this system has been previously reviewed and approved by the NRC as a result of NUREG 0737 item II.F.1.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

60. Condenser Air Exhaust: Radioactive condenser gases are discharged through the auxiliary building stack (item 59).

61. Common Plant or Multipurpose Vent Discharge: There are two vents which release radioactive gas at the Kewaunee plant. They are the containment/shield building vent (item 18) and the auxiliary building vent (item 59).

62. Vent from the Steam Generators: The steam line radiation levels are converted into radioactivity concentrations by assuming a predetermined mixture of radionuclides. The instrument's range of $1x10^{-1}$ mrem/hr to $1x10^{7}$ mrem/hr corresponds to a range of .01 μCi/cc to $1.4x10^{4}$ μCi/cc. Release flow rates are determined by a heat balance equation performed in the technical support center. The instrument receives its power from a safety related diesel generator backed bus.

    The instrument is used to quantify releases during a tube rupture event. A tube rupture does not result in a harsh post accident environment. Therefore, this instrument does not require environmental qualification.

A review of the emergency response and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

63. All Other Release Points - Noble Gases: See item 61.

64. All Other Release Points - Particulate and Halogens: See item 61.

65. Airborne Radiohalogens and Particulates (Portable Sampling): The NRC has reviewed and approved Kewaunee's portable sampling and on site analysis capability in accordance with item II.D.3.3 of NUREG 0737.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

66. Plant and Environmental Radiation (Portable Instrument): There are radiation detectors at the Kewaunee plant that meet the requirements specified by RG 1.97.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

67. Plant and Environmental Radioactivity (Isotopic Analysis): Kewaunee has the capability of taking samples; e.g., airborne, swipes, etc., and then performing an in-house isotopic analysis on them.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

68. Wind Direction: The NRC has reviewed and approved the design of this instrument in accordance with NUREG 0737 item III.A.2.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

69. Wind Speed: The NRC has reviewed and approved the design of this instrument in accordance with NUREG 0737 item III.A.2.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

70. Estimate of Atmospheric Stability: The range of this instrument (-5°F to 10°F) is less than that required by RG 1.97. However, it is sufficient to define the seven stability classes identified in Kewaunee's E-Plan. The NRC has reviewed and approved this instrument in accordance with NUREG 0737 item III.A.2.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

71. Primary Coolant and Sump: A high radiation sample room with on site analysis capability has been installed at the Kewaunee plant. The NRC has reviewed and approved these facilities in accordance with NUREG 0737 item II.B.3.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

72. Containment Air: The NRC has reviewed and approved Kewaunee's containment sampling capability in accordance with NUREG 0737 item II.B.3.

    However, a review of the emergency response guidelines and the emergency operating procedures has determined that neither the operators nor the shift technical advisor would require this instrument during or following an accident.

Attachment 3

To The Letter

From: C. R. Steinhardt (WPSC)

To: The NRC Document Control Desk

Dated:

24 October 1988

Re: RG 1.97

Channel Number	Channel Name	Instrument Type	Sensitivity	Range	Set Points**
SPING 01	Auxiliary Building Stack Sampler				
01-01	Beta Particulate	Beta Scintillation	9.38 E-4 µCi	9.38 E-4 to 2.21 E+1 µCi µCi	
01-02	Alpha Particulate	Solid State Alpha	5.1 E+0 CPM	5.1 E+0 to 1.2 E+6 CPM CPM	
01-03	Iodine	Beta Scintillation	1.12 E-3 µCI	1.12 E-3 to 2.63 E+1 µCi µCi	
01-04	Iodine Background	Beta Scintillation (Part of 01-03)	CPM		
01-05	Lo Range Gas	Beta Scintillation	2.85 E-6 µCi/cc	2.85 E-6 to 6.70 E-2 µC/cc µC/cc	
01-06	Gamma Area Monitor	GM Tube	8.06 E-2 mR/hr	8.06 E-2 to 1.90 E+3 mR/hr mR/hr	
01-07	Mid Range Gas	GM Tube	7.29 E+1 γ-βqMev/cc	7.29 E+1 to 1.72 E+6 γ-βqMev/cc γ-βqMev/cc	
01-08	Gas Background	GM Tube	CPM		
01-09	Hi Range Gas	GM Tube	5.66 E+3 γ-βqMev/cc	5.66 E+3 to 1.33 E+8 γ-βqMev/cc γ-βqMev/cc	
SPING 02	Containment Building Stack Sampler				
02-01	Beta Particulate	Beta Scintillation	1.02 E-3 µCi	1.02 E-3 to 2.4 E+1 µCi µCi	
02-02	Alpha Particulate	Solid State Alpha	5.1 E+0 CPM	5.1 E+0 to 1.2 E+6 CPM CPM	
02-03	Iodine	Beta Scintillation	1.10 E-3 µCI	1.10 E-3 to 2.58 E+1 µCi µCi	
02-04	Iodine Background	Beta Scintillation (Part of 02-03)	CPM		
02-05	Lo Range Gas	Beta Scintillation	6.38 E-6 µCi/cc	6.38 E-6 to 1.50 E-2 µC/cc µC/cc	
02-06	Gamma Area Monitor	GM Tube	9.95 E-2 mR/hr	9.95 E-2 to 2.34 E+3 mR/hr mR/hr	
02-07	Mid Range Gas	GM Tube	7.65 E+1 γ-βqMev/cc	7.65 E+1 to 1.8 E+6 γ-βqMev/cc γ-βqMev/cc	
02-08	Gas Background	GM Tube	CPM		
02-09	Hi Range Gas	GM Tube	6.27 E+3 γ-βqMev/cc	6.27 E+3 to 1.48 E+8 γ-βqMev/cc γ-βqMev/cc	
SPING 03-01	Waste Disposal Panel Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING 03-02	Post Accident Sampling Room Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING 03-03	Component Cooling Heat Exchanger Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*

*Statistically significant level.
**Provisional above background.

Attachment 4

To The Letter

From: C. R. Steinhardt (WPSC)

To: The NRC Document Control Desk

Dated:

24 October 1988

Re: RG 1.97

Channel Number	Channel Name	Instrument Type	Sensitivity	Range	Set Points**
03-01	Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	Post Accident Sampling Room				
03-02	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	Component Cooling Heat Exchanger				
03-03	Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	Machine Shop				
04-01	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	Monitor Room				
04-02	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	Make Up Demineralizer				
04-03	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	Cold Chem Lab				
04-04	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	RHR Pumps				
05-01	Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	Radwaste Compactor				
05-02	Area Monitor - Lo Range	GM Tube	0.1 mR/hr	0.1 mR/hr to 10 R/hr	*
SPING	Auxiliary Building Loading Dock				
05-03	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	I&C Shop				
06-01	Area Monitor - Lo Range	GM Tube	0.1 mR/hr	0.1 mR/hr to 10 R/hr	*
SPING	Shield Building Ventilation Filters				
06-02	Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	Control Room Air Conditioning Vent.				
06-03	Filters Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
SPING	Containment Ventilation Exhaust				
06-04	Filters Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	Zone 5V Exhaust Filters				
06-05	Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	RAF Count Room				
07-01	Area Monitor - Lo Range	GM Tube	0.1 mR/hr	0.1 mR/hr to 10 R/hr	*
SPING	Tech. Support Center				
07-02	Area Monitor - Lo Range	GM Tube	0.1 mR/hr	0.1 mR/hr to 10 R/hr	*
SPING	TSC Stairwell				
07-03	Area Monitor - Lo Range	GM Tube	0.1 mR/hr	0.1 mR/hr to 10 R/hr	*
SPING	Sulfuric Acid Storage Tank				
08-01	Area Monitor - Lo Range	GM Tube	0.1 mR/hr	0.1 mR/hr to 10 R/hr	*
SPING	Containment Spray Pumps				
08-02	Area Monitor - Hi Range	Ion Chamber	100 mR/hr	100 mR/hr to 10,000 R/hr	*
SPING	Heating Boiler				
08-03	Area Monitor - Int. Range	Ion Chamber	1 mR/hr	1 mR/hr to 100 R/hr	*
INST. NO. 2906401	Containment Hi Level Radiation Monitor 1B	Ion Chamber		10^0 to 10^8 R/hr	*
INST. NO. 2906501	Containment Hi Level Radiation Monitor 1A	Ion Chamber		10^0 to 10^8 R/hr	

*Statistically significant level.
**Provisional above background.