Docket No. 50-336
A04770
A02959

Attachment No. 1

Millstone Nuclear Power Station, Unit No. 2

Status of Compliance with Revision 2 to
Regulatory Guide 1.97

June 1987

This attachment presents a table summarizing the status of compliance of Millstone Unit No. 2 with Regulatory Guide 1.97, Revision 2. The following is an explanation of the terminology used in the various columns.

VARIABLE - A single asterisk ("*") after a variable number indicates that the variable is monitored but not considered part of the post-accident monitoring system.

A double asterisk ("**") after a variable number indicates that the variable is not monitored and is not considered part of the post-accident monitoring system.

INSTRUMENT RANGE - Where the NRC and Millstone Unit No. 2 instrument ranges are not directly comparable due to unit differences, the Millstone Unit No. 2 ranges meet or exceed the NRC ranges unless otherwise noted.

EQ (ENVIRONMENTAL QUALIFICATION) - A "yes" entry means that the instrument is or will be qualified in accordance with the qualification requirements of 10CFR50.49.

SEISMIC QUALIFICATION - A "yes" entry means that the instrument is or will be qualified to present licensing commitments.

QA (QUALITY ASSURANCE) - A "yes" entry means that the instrument is considered Cat.IE by NNECO. Maintenance and spare parts procurement are in accordance with NNECO's QA program.

SCHEDULE - If this column is left blank, Northeast Nuclear Energy Company considers the existing instrument to be adequate for the intent of the regulatory guide. A "year" entry means the refueling outage of that year when replacement is scheduled to be completed.

POWER SUPPLY - A "REL" entry means reliable. This power supply is backed up by the diesel. "1E" - power at Millstone Unit No. 2 is the vital ac which is a non-interruptible power supply.

LOCATION OF DISPLAY:

CONTROL ROOM, TSC AND EOF - An "I" entry means it has continuous indication, and "R" is continuous recording unless otherwise noted. "R*" indicates the provision of the guide which could either be continuous recording or stored in computer memory and displayed on demand. The "ERIS" entry, which stands for the Emergency Response Information System, should be disregarded at this time. We are continuing our evaluation to determine whether additional information needs exist in the TSC and EOF.

LOCATION OF SENSOR:

CNMT - Containment
A.B. - Auxiliary Building
T.B. - Turbine Building

For Category 2 variables, the location of sensors is further classified as harsh or non-harsh environments.

MILLSTONE UNIT NO. 2 SUMMARY OF COMPLIANCE
WITH REGULATORY GUIDE 1.97 REV. 2

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
TYPE A													
A-1 Pressurizer Level	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-100%	Yes	Yes	Yes		Yes	REL. (Note 40)	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
A-2 Pressurizer Pressure	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-3,000 psig (Note 4)	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
A-3 RCS Hot Leg Water Temperature	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	150°F-750°F	Yes	Yes	Yes		Yes (Note 27)	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
A-4 RCS Cold Leg Water Temperature	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-600°F	Yes	Yes	Yes		Yes (Note 27)	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
A-5 Steam Generator Pressure	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-1,000 psig	Yes	Yes	Yes		Yes	1E	I&(ERIS) (Note 16)	(ERIS)	(ERIS)	CNMT
A-6 Steam Generator Level	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	Top of Tube Bundle to Separators	Yes	Yes	Yes		Yes	1E	I&(ERIS) (Note 20)	(ERIS)	(ERIS)	CNMT
A-7 Auxiliary Feedwater Flow	NRC	1		Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-600 gpm	Yes	Yes	Yes		Yes	1E	I&(ERIS) (Note 20)	(ERIS)	(ERIS)	A.B.
A-8 Containment Pressure	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	-5 to 250 psig	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	A.B.

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
A-9 Degrees of Subcooling	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	200°F Subcooling to 35°F Superheat	Yes	Yes	Yes		Yes	1E	I& (ERIS)	(ERIS)	(ERIS)	CNMT
A-10 Hydrogen Monitor	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-10%	No (Note 33)	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	A.B.
A-11 Containment Radiation	NRC	1	-	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	1-10^8 R/hr	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
TYPE B													
Reactivity Control													
B-1 Neutron Flux	NRC	1	10^{-6} to 100% Full Power	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	10^{-8} to 150% Full Power	Yes	Yes	Yes		Yes	1E	I&(ERIS) (Note 20)	(ERIS)	(ERIS)	Reactor
B-2 Control Rod Position	NRC	3	Full In or Not Full In	No	No	No		No	-	I			
	MP-2	3	Full In or Not Full In	No	No	Yes		Yes	REL.	I& (ERIS)	(ERIS)	(ERIS)	CNMT
B-3* RCS Soluble Boron Concentration	NRC	3	0-6,000 ppm	No	No	No		No	-	I			
	MP-2	3	0-2,050 ppm (Note 1)	No	No	No		No	REL.	I			
B-4 RCS Cold Leg Water Temperature	NRC	1	50-750°F	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-600°F (Note 2)	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
CORE COOLING													
B-5 RCS Hot Leg Water Temperature	NRC	1	50-750°F	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	150-750°F (Note 3)	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
B-6 RCS Cold Leg Water Temperature	(See Variable B-4)												
B-7 RCS Pressure	NRC	1	0-4,000 psig	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-3,000 psig (Note 4)	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
B-8 Core Exit Thermocouple	NRC	3	200-1,650°F	No	No	No		No	REL.	I			
	MP-2	1	0-2,500°F	Yes (Note 5)	Yes	Yes		Yes	1E (Note 5)	I&(ERIS) (Note 20)	(ERIS)	(ERIS)	Reactor
B-9 Coolant Level in Reactor	NRC	1	Bottom of Core to top of Vessel	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	Top of Core to Top of Vessel (Note 6)	Yes	Yes	Yes		Yes	1E	I& (ERIS)	(ERIS)	(ERIS)	Reactor
B-10 Degrees of Subcooling	NRC	2	200°F Sub-cooling to 35°F Super-heat	Yes	Yes	-		No	1E	I			
	MP-2	1	200°F Sub-cooling to 35°F Superheat	Yes	Yes	Yes		Yes	1E	I& (ERIS)	(ERIS)	(ERIS)	CNMT
MAINTAINING REACTOR COOLANT SYSTEM INTEGRITY													
B-11 RCS Pressure	(See Variable B-7)												
B-12a Containment Sump Water Level (W.R.)	NRC	1	bottom of CNMT to 600,000 gal. equiv.	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	-22'6" to -15'6" (Note 30)	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
B-12b* Containment Sump Water Level (N.R.)	NRC	2	Sump Depth	Yes	No	-		No	REL.	I			
	MP-2	2	0-100%	No (Note: 43)	No	No		No	REL.	I			CNMT

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
B-13 Containment Pressure	NRC	1	0 to Design Pressure	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-60 psig	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	A.B.
MAINTAINING CONTAINMENT INTEGRITY													
B-14 Containment Isolation Valve Position	NRC	1	Closed - Not Closed	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	Closed - Not Closed	Yes	Yes	Yes		Yes	1E	I			CNMT/A.B.
	(Proposed) (Note 44)	1	Closed - Not Closed	(Yes)	(Yes)	(Yes)	(1988)	(Yes)	(1E)	(I)			
B-15 Containment Pressure	NRC	1	10 psia to Design Pressure	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	(See Variable B-13) (Note 28)										
TYPE C													
FUEL CLADDING													
C-1 Core Exit Temperature	NRC	1	200°F to 1650°F	Yes	Yes	Yes		Yes	1E	I&R*			
	MP2		(See Variable B-8)										
C-2** Radioactivity Conc. Circ. Primary Coolant	NRC	1	1/2 T.S. Limit to 100 X T.S. Limits	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	(No Instrument - See Note 8)											
C-3 Analysis of Primary Coolant (Gamma Spectrum)	NRC	3	10 µCi/ml to 10 Ci/ml	No	No	No		No	-	I			
	MP-2	P.A.S.S. (See Note 8)											
REACTOR COOLANT PRESSURE BOUNDARY													
C-4 RCS Pressure	(See Variable B-7)												
C-5 Containment Pressure	(See Variable B-13) (Note 28)												
C-6 Containment Sump Water Level	(See Variables B-12a & B-12b)												

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
C-7 Containment Area Radiation	NRC	1	1 to 10^4 R/hr	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	1 to 10^8 R/hr	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	CNMT
C-8 Eff. Radioactivity Noble Gas From Condenser Air Removal Exhaust	NRC	3	10^{-6} to 10^{-2} µCi/CC	No	No	No		No	-	I			
	MP-2	3	10^{-7} to 10^{-2} µCi/CC	No	No	No		No	-	I& (ERIS)	(ERIS)	(ERIS)	T.B.
CONTAINMENT													
C-9 RCS Pressure	(See Variable B-7)												
C-10 Containment Hydrogen Concentration	NRC	1	0-10% (operable from 10 psia to D.P.)	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	0-10% (Note 31)	No (Note 33)	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	A.B.
C-11 Containment Pressure	NRC	1	10 PSIA to 3X Design Pressure	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2	1	-5 to 250 psig	Yes	Yes	Yes		Yes	1E	I&R (ERIS)	(ERIS)	(ERIS)	A.B.
C-12 Containment Eff. Radioactivity Noble Gas from Identified Release Points	NRC	2	10^{-6} to 10^{-2} µCi/CC	Yes	No	-		No	REL.	I&R			
	MP-2		(See Variable C-14)										
C-13** Radiation Exposure Rate (Inside Bldgs.)	NRC	2	10^{-1} to 10^4 R/hr.	Yes	No	-		No	REL.	I			
	MP-2		(See Note 9)										
C-14 Effluent Radioactivity (Inside Bldgs.)	NRC	2	10^{-6} to 10^3 µCi/CC	Yes	No	-		No	REL.	I&R			
	MP-2	2	5X 10^{-7} to 10^4 µCi/CC	No	No	No		No	REL.	I&R (ERIS)	(ERIS)	(ERIS)	A.B. Nonharsh

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
TYPE D													
RESIDUAL HEAT REMOVAL SYSTEM													
D-1 RHR System Flow	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-7,000 gpm	No (Note 35)	No	No		No	REL.	I			A.B. Harsh
D-2 RHR HT. Ex. Outlet Temperature	NRC	2	32-350°F	Yes	No	-		No	REL.	I			
	MP-2	2	0-400°F	No (Note 38)	No	No		No	REL.	I			A.B. Harsh
SAFETY INJECTION SYSTEMS													
D-3a* Accumulator Tank Level	NRC	2	10-90% Volume	Yes	No	-		No	REL.	I			
	MP-2	2	3" to 327"	No (Note 32)	No	No		No	1E	I			CNMT Harsh
D-3b* Accumulator Tank Pressure	NRC	2	0-750 psig	Yes	No	-		No	REL.	I			
	MP-2	2	0-250 psig (Note 10)	No (Note 32)	No	No		No	REL.	I			CNMT Harsh
D-4 Accumulator Iso. Valve Position	NRC	2	Closed-Open	Yes	No	-		No	REL.	I			
	MP-2	2	Closed-Open	Yes	No	Yes		No	REL.	I			CNMT Harsh
D-5 Boric Acid Charging Flow	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-140 gpm	No	No	No		No	REL.	I&R (ERIS)	(ERIS)	(ERIS)	A.B. Nonharsh
D-6 Flow In HPI	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-300 gpm	No (Note 35)	No	No		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh
D-7 Flow In LPI	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-3,000 gpm	No (Note 35)	No	No		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh
D-8 RWST Level	NRC	2	Top to Bottom	Yes	No	-		No	REL.	I			
	MP-2	2	4.3 to 100%	No	Yes	Yes		Yes	1E	I& (ERIS)	(ERIS)	(ERIS)	Yard Nonharsh

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
PRIMARY COOLANT SYSTEM													
D-9 Reactor Coolant Pump Status	NRC	3	Motor Current	No	No	No		No	-	I			
	MP-2	3	0-600 Amps.	No	No	No		No		I& (ERIS)	(ERIS)	(ERIS)	A.B.
D-10 Primary System SRV	NRC	2	Closed - Not Closed	Yes	No	-		No	REL.	I			
	MP-2	2	Closed - Not Closed	Yes (Note 11)	No	Yes		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	CNMT Harsh
D-11 Pressurizer Level	NRC	1	Bottom to Top	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2		(See Variable A-1)										
D-12 Pressurizer Heater Status	NRC	2	Electric Current	Yes	No	-		No	REL	I			
	MP-2	2	(See Note 12)	No	No	No		No	REL.	I			A.B. Nonharsh
	(Proposed)	(2)	Electric Current	(No)	(No)	(Yes)	(1989)	(No)	(REL.)	(I)			
D-13* Quench Tank Level	NRC	3	Top to Bottom	No	No	No		No		I			
	MP-2	3	0-40" (Note 13)	No	No	No		No	REL.	I			CNMT
D-14* Quench Tank Temperature	NRC	3	50-750°F	No	No	No		No		I			
	MP-2	3	0-300°F (Note 14)	No	No	No		No	REL.	I			CNMT
D-15* Quench Tank Pressure	NRC	3	0-Design	No	No	No		No		I			
	MP-2	3	0-100 psig	No	No	No		No	REL.	I			CNMT
SECONDARY SYSTEM (STEAM GENERATOR)													
D-16 Steam Generator Level	NRC	1	From Tube Sheet to Separators	Yes	Yes	Yes		Yes	1E	I&R*			
	MP-2		(See Table A-6, Note 15)										
D-17 Steam Generator Pressure	NRC	2	0-1,200 psig	Yes	No	-		No	REL.	I			
	MP-2	2	0-1,200 psig	Yes	Yes	Yes		Yes	1E	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
D-18 SRV Position	NRC	2	Closed - Not Closed	Yes	No	-		No	REL.	I			
	MP-2	(No Existing Instrument, Note 17)											
	(Proposed)	(2)	Closed-Not Closed	(Yes)	(No)	(Yes)	(1989)	(No)	(REL.)	(I&) (ERIS)	(ERIS)	(ERIS)	
D-19 Main Feedwater Flow	NRC	3	0-110% D.F.	No	No	No		No		I			
	MP-2	3	0-6.3 X 10^6 lbs/hr	No	Yes	No		No	REL.	I&R (ERIS)	(ERIS)	(ERIS)	T.B.
AUXILIARY FEEDWATER OR EMERGENCY FEEDWATER SYSTEM													
D-20 Auxiliary Feedwater Flow	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-600 gpm	Yes	Yes	Yes		Yes	1E	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh
D-21 Condensate Storage Tank Level	NRC	1	Plant Specific	Yes	Yes	Yes		Yes	1F	I&R*			
	MP-2	1	0-334" (Note 18)	Yes	Yes	Yes		Yes	REL. 1E	I& (ERIS)	(ERIS)	(ERIS)	Yard
CONTAINMENT COOLING SYSTEM													
D-22 Containment Spray Flow	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-5,000 gpm	No (Note 35)	No	No		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh
D-23** Heat Removal By CNMT. Fan Heat Removal System	NRC	2	Plant Specific	Yes	No	-		No	REL.	I			
	MP-2												
D-24 Containment Atmosphere Temperature	NRC	2	40-400°F	Yes	No	-		No	REL.	I			
	MP-2	3	0-350°F (Note 19)	No (Note 41)	No	No		No	REL.	I&	(ERIS) (ERIS)	(ERIS)	CNMT Harsh
D-25** Containment Sump Water Temperature	NRC	2	50-250°F	Yes	No	-		No	REL.	I			
	MP-2	(No Existing Instrument)											
CHEMICAL AND VOLUME CONTROL SYSTEM													
D-26 Make Up Flow In	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-140 gpm	No (Note 36)	No	No		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
D-27 Letdown Flow Cut	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-140 gpm	No (Note 37)	No	No		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	A.B. Harsh
D-28* Volume Control Tank Level	NRC	2	Top to Bottom	Yes	No	-		No	REL.	I			
	MP-2	2	0-125"	No	No	No		No	REL.	I			A.B. Harsh
COOLING WATER SYSTEM													
D-29 CCW Temp. to ESF System	NRC	2	32-200°F	Yes	No	-		No	REL.	I			
	MP-2	2	0-200°F	No (Note 42)	No	No		No	REL.	I			A.B. Harsh
D-30 CCW Flow to ESF System	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-10,000 gpm	No (Note 35)	No	No		No	REL.	I			A.B. Harsh
RADWASTE SYSTEM													
D-31* High Level Rad. Liquid Level	NRC	3	Top to Bottom	No	No	No		No	-	I			
	MP-2	3	0-48"	No	No	No		No	REL.	I			CNMT
D-32* Rad. Gas Holdup Tank Pressure	NRC	3	0-150% Design	No	No	No		No	-	I			
	MP-2	3	0-25 psig	No	No	No		No	REL.	I			A.B.
VENTILATION SYSTEMS													
D-33 Emergency Ventilation Damper Pos.	NRC	2	Open-Closed	Yes	No	-		No	REL.	I			
	MP-2	2	Open-Closed	Yes	No	Yes		Yes	REL. IE	I I			T.B. Nonharsh
POWER SUPPLIES													
D-34 Status of S/B Power and Other Energy Sources	NRC	2	Volts, Amps., Pressures	Yes	No	-		No	REL.	I			
	MP-2	2	Volts, Amps., Pressure (Note 22)	No	No	No		No	REL.	I& (ERIS)	(ERIS)	(ERIS)	

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
TYPE E													
CONTAINMENT RADIATION													
E-1 Containment Radiation	(See Variable C-7)												
AREA RADIATION													
E-2 Radiation Exposure Rate	NRC	2	10^{-1} -10^{4} R/hr	Yes	No	-		No	REL.	I			
	MP-2	3	(Note 23)	No	No	No		No	REL.	I			
AIRBORNE RADIOACTIVE MATERIALS RELEASED FROM PLANT													
E-3a Common Vent-Noble Gas	(See Variable C-14)												
Plant Vent Flow	NRC	2	0-110% D.F.	Yes	No	-		No	REL.	I			
	MP-2	2	0-10^{5} SCFM	No	No	No		No	REL.	(Local I&R)			A.B. Harsh
E-3b Vent from S/G or Steam Dump	NRC	2	10^{-1} to 10^{3} µCi/CC	Yes	No	No		No	REL.	I&R			
	MP-2	2	(No Existing Instrument) (Note 24)	No	No	Yes		No	REL.	I&R (ERIS)	(ERIS)	(ERIS)	Non-Harsh
E-4 Particulates and Halogens	NRC	3	10^{-3} to 10^{2} µCi/CC	No	No	No		No	-	-			
	MP-2	3	(See Note 25)	No	No	No		No	-	-			
ENVIRONS RADIATION AND RADIOACTIVITY													
E-5a** Rad. Exposure Meters	(This is not a cost-effective system per NUREG/CR 2644) (Deleted on R.G. 1.97, Rev. 3)												
E-5B Airborne Radio Halogens Particulates	NRC	3	10^{-9} to 10^{-3} µCi/CC	No	No	No		No	-	-			
	MP-2	3	(Note 26)	No	No	No		No	-	-			
E-5C Plant and Environs Radioactivity	NRC	3	Isotopic Analysis	No	No	No		No	(Portable Instruments)				
	MP-2	3	(Note 26)	No	No	No		No					

Variable		Category	Inst. Range	EQ	Seismic Quals.	QA	Schedule	Redundant	Power Supply	Location of Display C.R.	TSC	EOF	Location of Sensor
E-6													
Meteorology	NRC	3	As Specified R.G. 1.97, Rev. 2	No	No	No		No	-	I			
	MP-2	3	As Specified R.G. 1.97, Rev. 2	No	No	No		No	REL.	I&R (ERIS) (Note 39)	(ERIS)	(ERIS)	Yard
E-7													
Accident Sampling Capability	NRC	3	As Specified	No	No	No		No	-	-			
	MP-2	3	As Specified (Note 34)	No	No	No		No	-	-			

NOTES:

Note 1: The present 2,050 ppm range is sufficient to monitor beyond the Technical Specification limit of 1,720 ppm. In cases where higher range is required, the Post Accident Sampling System (PASS) will be utilized.

Note 2: Based on the safety analysis of the plant, the existing range of 0-600°F is sufficient to monitor cold leg fluid temperature conditions following all design basis accident scenarios.

Note 3: Since 212°F is the saturation temperature at atmospheric pressure, the 150°F lower range provides sufficient margin to monitor the approach to saturation in a cold shutdown situation in the event of a loss of shutdown cooling.

Note 4: The full range is covered by several instruments with ranges of 0-1,600 psig, 1,500-2,500 psig and 0-3,000 psig. The 1,500-2,500-psig instruments are Cat. 1E instruments. The 0-1,600 range instruments were upgraded during the 1983 outage. The 0-3,000-psig instrument is a non-Cat. 1E single-channel instrument powered from a reliable nonvital power supply with continuous recording. NNECO considers the upper range of 3000 psig adequate for all design basis events.

Note 5: Deleted.

Note 6: The proposed range has been justified in NNECO's reply, dated March 11, 1983 to D. G. Eisenhut letter to all licensees of operating

Westinghouse and CE PWRs (Generic Letter 82-28) dated December 10, 1982. Also, Revision 3 to Regulatory Guide 1.97 only requests a range from the bottom of the hot leg to the top of the vessel.

Note 7: Deleted.

Note 8: No existing in-line monitor. The Post Accident Sampling System (PASS) will be utilized. The PASS was recently installed in accordance with NUREG-0737, Item II.B.3. The required range of activity can be analyzed.

Note 9: This parameter has been deleted in Regulatory Guide 1.97, Rev. 3.

Note 10: The tank design pressure is 250 psig.

Note 11: The Acoustic Valve Monitoring System (AVMS) was upgraded during the 1983 refueling outage.

Note 12: The pressurizer heaters are monitored by breaker status indicating lights.

Note 13: This is a horizontal cylindrical tank with a 60-inch O.D. The instrument measures 40 inches of the center of the tank.

Note 14: The range of 0-300°F is sufficient to monitor normal as well as design basis accident scenarios.

Note 15: There are no instrument taps in the S/G to allow direct wide-range level measurement.

Note 16: Steam generator pressure is recorded by Category 2 instruments. See variable D-17.

Note 17: There is no existing instrument to indicate the safety relief valve position. New instruments will be installed.

Note 18: The condensate storage tank level instrumentation consists of an electronic level instrument loop with alarm and continuous indication in the control room. In addition, a pneumatic level controller with local indication and high and low alarms is also available in the control room. The electronic loop has been upgraded while the pneumatic loop will be kept as is because of the inherent reliability of pneumatic instruments. These instruments are located in a non-harsh environment.

Note 19: There are several RTDs that go to a selector switch in the control room. A single indicator is used to indicate the selected RTD. The maximum predicted containment temperature is less than 300°F.

Note 20: This parameter is an input to the plant process computer, and can be recorded on demand.

Note 21: Deleted.

Note 22: The status of the diesels are indicated by voltmeters, ammeters and power meters. The status of the starting air for the diesels is alarmed at the control room. The emergency bus voltages are continuously indicated at the control room. All sensors are located in a mild environment.

Note 23: The area radiation monitors are located throughout the radiological control areas of the plant. However, most of them have an upper range of 10^4 to 10^6 mr/hr. The function of the fixed area monitor is to warn of changing or unusually high radiological conditions. This can be accomplished with the existing instruments. Personnel access to areas under accident conditions would be allowed only with appropriate portable survey instruments. Also, Rev. 3 of Regulatory Guide 1.97 classifies this parameter as Cat. 3.

Note 24: The previous method of determining noble gas release was by sending an individual under the main steam line with portable instruments. To meet the provisions of the regulatory guide, NNECO has installed Area Radiation Monitors at the east steam line and the west steam line. These monitors indicate and record in the control room. The flow is calculated using steam generator pressure and valve specifications and meets the instrument range specified in the guide.

Note 25: The stack monitors are equipped with Particulate and Iodine filters which are utilized for laboratory analysis. The required range of concentrations will be met.

Note 26: The plant is equipped with portable instruments which are capable of meeting all the provisions of the guide.

Note 27: There is only one wide range temperature instrument in each of the hot legs and cold legs.

Note 28: The lower range of 10 psia is covered by the wide range instrumentation.

Note 29: Deleted.

Note 30: Design verification indicates that this level range can measure up to 565,000 gallons. This is acceptable because the maximum post-accident containment water volume will not exceed approximately 563,800 gallons. Details are provided in the W. G. Counsil letter to R. A. Clark, dated March 8, 1983.

Note 31: The analyzers are designed for operation under a positive containment pressure up to 10 psig. The Millstone Unit No. 2 containment will not see a negative pressure under any FSAR analyzed accident conditions. This pressure range is presently being addressed under NUREG-0737, Item II.F.1, Attachment 6. (See W. G. Counsil letter to J. R. Miller, dated March 27, 1984).

Note 32: The pressure and level indications for the safety injection tanks are important in verifying the operability of the system during normal operations. However, their importance is diminished during and after an accident, for the following reasons:

a. They provide no automatic function.

b. No operator actions are based on their indication.

c. The system is passive and functions early in an accident (LOCA).

Note 33: The hydrogen analyzers were modifed in response to NUREG-0737, Item II.F.1, Attachment 6. The sensitive electronic parts of the system were moved from a potentially harsh environment to the control room.

Note 34: The PASS does not have the capability to analyze for dissolved O_2. The NRC Staff concluded our PASS was acceptable in the Safety Evaluation on NUREG-0737 Item II.B.3, transmitted in J.R. Miller's letter to W.G. Counsil, dated June 14, 1984.

Note 35: Motor ammeter readings in the control room are utilized to back up the flow indication. The sensors for the ammeters are located in mild environments. In addition, failure of the flow indication does not jeopardize the operability of the system it is monitoring.

Note 36: Charging header pressure can be used to back up the charging flow indication.

Note 37: Pressurizer level or differential pressure across the letdown filter can be utilized to back up the letdown flow indication.

Note 38: RHR heat exchanger outlet temperature can be verified by trending reactor coolant temperature.

Note 39: This information is displayed in the Millstone Unit No. 1 control room.

Note 40: The pressurizer level instruments were upgraded during the 1985 refueling outage to meet EEQ requirements. The instruments are part of the cabinets which were procured mainly for the feedwater control system. These cabinets are powered from an instrument power supply that is highly reliable but not category 1E. Although this power source is not classified as category 1E, the diesel generators provide backup power. The only difference between a category 1E power supply and this instrument power supply is that the category 1E supply is backed by the station batteries via the inverters which ensures that there is no momentary power interruption during transfers from "normal" to "emergency" power and vice versa. The design of the instrument power supply will result in a momentary interruption during transfers, however, the pressurizer level instruments are designed to tolerate these momentary interruptions.

Based on the above, it is concluded that the pressurizer level instrumentation, as modified, is adequate for post-accident monitoring functions.

Note 41: The key variable required to assess the condition of the containment is containment pressure. Containment temperature is utilized only in a

diagnostic capacity. Based on the above, it is concluded that this parameter is category 3 which is a "high quality, off-the-shelf" instrument powered from a highly reliable power supply.

Note 42: CCW to ESF systems is provided by the RBCCW system. The RBCCW outlet temperature is the CCW temperature to ESF system. These instruments have no safety function and their failure does not jeopardize the operability of the RBCCW system. Based on this, the existing instruments are judged to be adequate.

Note 43: The narrow range sump level instruments are utilized during normal operation to indicate level and initiate an alarm for the operator to manually start the sump pumps. During an accident, the sumps would be filled and the operators will not start the sump pumps, to avoid transferring contaminated water outside the containment.

To monitor containment water level following an accident, the wide range containment level instruments are utilized.

Note 44: Upon reevaluation, it was determined that seven (7) containment isolation valves located outside containment need to have their position indication upgraded to be fully qualified under Regulatory Guide 1.97. Accordingly, the following containment isolation valves will have their position indication upgraded during the refueling outage scheduled for January - March, 1988 to ensure that these valves communicate proper position indication to the control room during post-accident conditions.

- o 2CH-198 - RCS Bleed-off
- o 2 AC-47,12,15 - Containment Atmosphere Sampling
- o 2EB-92,99 - Containment H_2 Purge
- o 2SSP-16.2 - Normal Containment Sump Discharge

Docket No. 50-336
A04770
A02959

Attachment No. 2

Millstone Nuclear Power Station, Unit No. 2

Control Room Design Review
Human Engineering Discrepancies

June 1987

MP2
HUMAN ENGINEERING DISCREPANCY

HED No. TA-032

TITLE: Information Requirements PRIORITY: 1

COMMENT:
Off-Scale Meters

Reviewer	Date	Ref.	Source
CT	1-14-86	EOP2525(N-3.16)	TA

IDENTIFICATION: Panel: C05

Component Name: SG Level

ID OR NO.: None

DESCRIPTION:

The procedure caution note has level going below 0% after trip but no indication is provided until it returns to an indicating range. All SG Lvl Indicators are Narrow Range. No Wide Range available.

POSSIBLE SOLUTIONS:

Provide Wide Range Level Instruments

RESOLUTION: (Code A)

Correct/Enhance

Add WR level instruments for both SG's.
See Enhancement Design for location.
See memo MP2-CRDR-86-031.

Approved Signature: T A Shaffer Date: 1/20/86

/ / Additional page(s) attached

MP2
HUMAN ENGINEERING DISCREPANCY

HED No. TA-009

TITLE:
Procedural Instructions PRIORITY: 1

COMMENT:
Procedure indicates to take an action

Reviewer	Date	Ref.	Source
CT	1-14-86	EOP2525(C-3.3.a)	TA

IDENTIFICATION: Panel: C03

Component Name: PZR Heaters

ID OR NO.: PROP & BACK-UP HTRS

DESCRIPTION:

The procedure indicates to manually control the PZR HTRS to return the Pres to 2225-2300 psia. The question raised was if at first the operator needs to evaluate this need due to system dynamics and the proportional heaters. Also the Control is a Demand Device. His feedback is the PZR PRES output signal on the controller.

POSSIBLE SOLUTIONS:

RESOLUTION: (Code A)
Correction/Procedure
Revise procedure to "evaluate" the use of the HTRS.
HTRS - Add meters (2) to each bank of proportional heaters for indication of operability of the controller. The lights only indicate the C/B (not the controller) is on/off.
See memo MP2-CRDR-86-031.

Approved Signature: TA Staff Date: 1/22/86

/ / Additional page(s) attached