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SUBJECT: Forwards response to Generic Ltr 82-33 (NUREG-0737,Suppl 1), re compliance w/Reg Guide 1.97 concerning instrumentation for light-water-cooled nuclear plants to assess plant & environs conditions during & following accident.

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Director
Office of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

NUREG-0737 Supplement 1 - Generic Letter 82-33
Regulatory Guide 1.97 - Application to Emergency Response Facilities

This submittal is in response to Paragraph 6.2 of the subject Generic Letter. Our submittal is in the form of a computer printout tabulation including several pages of applicable notes.

The tabulation provides required data for each appropriate Reg. Guide 1.97 variable including proposed implementation dates for those items not yet in place.

David Musolf
Manager-Nuclear Support Services

DMM/ECW/js

cc: Regional Administrator-III
NRR Project Manager, NRC
Resident Inspector, NRC
G Charnoff

Attachment

A003
1/40

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC NOTE 5	SCHEDULE	COMMENTS
B7. DRYWELL PRESSURE (B9, C8, C10, D4)	1	YES	SEIS B	QA A	2 CH.	-5 TO 250 PSIG	INSTR AC	RECORDERS	YES	YES	INSTALLED	
B8. DRYWELL SUMP LEVEL (C6)	1	NO	NO	QA B	NO	0-14"	INSTR AC	RECORDER	YES	YES	INSTALLED	IMPLEMENTED AS A CATEGORY 3 VARIABLE, SEE NOTE 9
MAINTAINING CONTAINMENT INTEGRITY												
B9. PRIMARY CONTAINMENT PRESSURE (B7, C8, (C10, D4)	1	- SAME AS VARIABLE B7 -										
B10. PRIMARY CONTAINMENT ISOLATION VALVE POSITION (EXCLUDING CHECK VALVES)	1	YES	SEIS B	QA B	NO	OPEN/CLOSED	INSTR AC OR DC	INDICA LITES	YES	YES	INSTALLED	SEE NOTE 10
FUEL CLADDING												
C1. RADIOACTIVITY CONCENTRATION OR RADIATION LEVEL IN CIRCULATING PRIMARY COOLANT	1	NO	NO	QA A	NO	1/2 TO 100 TIMES TECH SPEC LIMIT	1E SOURCE	NO	NO	NO	INSTALLED	IMPLEMENTED AS A CATEGORY 3 VARIABLE, SEE NOTE 11
C2. ANALYSIS OF PRIMARY COOLANT (GAMMA SPECTRUM)	3	NA	NA	NA	NA	10 UCI/GM TO 10 CI/GM	NA	NA	NA	NA	NA	ON-SITE LAB ANALYSIS
C3. BWR CORE THERMOCOUPLES (B5)	1	- SAME AS VARIABLE B5 -										
REACTOR COOLANT PRESSURE BOUNDARY												
C4. RCS PRESSURE (B6, C9)	1	- SAME AS VARIABLE B6 -										
C5. PRIMARY CONTAINMENT AREA RADIATION (E1)	3	YES	SEIS B	QA A	2 CH.	1-10E8 R/HR	INSTR AC	INDICATORS AND RECORDERS	YES	YES	INSTALLED	IMPLEMENTED AS A CATEGORY 1 VARIABLE, SEE E1
C6. DRYWELL DRAIN SUMPS LEVEL (Identified and Unidentified Leakage) (B8)	1	- SAME AS VARIABLE B8 -										

MONTICELLO NUCLEAR POWER PLANT
SUMMARY INFORMATION FOR COMPLIANCE WITH
REGULATORY GUIDE 1.97
INSTRUMENTATION FOR LIGHT-WATER-COOLED
NUCLEAR POWER PLANTS TO ASSESS PLANT AND
ENVIRONS CONDITIONS DURING AND FOLLOWING AN ACCIDENT

MONTICELLO DETAILS

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC NOTE 5	SCHEDULE	COMMENTS
A1. COOLANT LEVEL IN REACTOR (B4)	1	YES	SEIS B	QA A	2 CH.	-335" TO +65"	INSTR AC	INDICATORS AND RECORDER	YES	YES	1984 REFUEL	THIS RANGE COVERS THE FUEL ZONE AND NORMAL OPERATING RANGE. QUALIFIED TRANSMITTERS AND CABLE WILL BE INSTALLED.
A2. SUPRESSION POOL WATER TEMPERATURE (D6)	1	YES	SEIS A	QA A	2 CH.	30-230 DEG F	INSTR AC	INDICATORS	YES	YES	1 CHANNEL INSTALLED	CHANNEL B INSTALLATION TO BE COMPLETED DURING 1984 REFUEL OUTAGE
REACTIVITY CONTROL												
B1. NEUTRON FLUX (APRM/SRM/IRM)	1	MILD	SEIS B	QA B	YES	10E-6 % TO 100%	DC & RPS	INDICATORS & RECORDERS	YES	YES	INSTALLED	SEE NOTE 6. ONLY APRMS READINGS TO BE AVAILABLE IN TSC AND EOF.
B2. CONTROL ROD POSITION	3	NO	NO	QA B	NO	FULL IN TO FULL OUT	INSTR AC	INDICATORS	NO	NO	INSTALLED	
B3. RCS SOLUBLE BORON CONCENTRATION (SAMPLE)	3	NA	NA	NA	NA	0 TO 1000 PPM	NA	NA	NA	NA	NA	ON-SITE LAB ANALYSIS
CORE COOLING												
B4. COOLANT LEVEL IN REACTOR (A1)	1	- SAME AS VARIABLE A1 -										SEE NOTE 7
B5. BWR CORE THERMOCOUPLES (C3)	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NONE	NOT IMPLEMENTED, OPEN ISSUE
MAINTAINING REACTOR COOLANT SYSTEM INTEGRITY												
B6. REACTOR PRESSURE (C4, D9)	1	YES	SEIS B	QA A	2 CH.	0-1500 PSI	INSTR AC	INDICATORS AND RECORDER	YES	YES	1985 REFUEL	SEE NOTE 8

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS. QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC NOTE 5	SCHEDULE	COMMENTS
C7. SUPRESSION POOL WATER LEVEL (D5)	1	YES	SEIS B	QA A	2 CH.	-8' TO 5'	INSTR AC	RECORDER	YES	YES	INSTALLED	
C8. DRYWELL PRESSURE (B7, B9, C10, D4)	1	- SAME AS VARIABLE B7 - - - - - - - - - - - - - - - - - -										
CONTAINMENT												
C9. RCS PRESSURE (B6, C4)	1	- SAME AS VARIABLE B6 -										
C10. PRIMARY CONTAINMENT PRESSURE (B7, B9 C8, D4)	1	- SAME AS VARIABLE B7 - - - - - - - - - - - - - - - - - -										
C11. CONTAINMENT AND DRYWELL HYDROGEN CONCENTRATION	1	YES	SEIS A	QA A	2 CH.	0-20%	1E SOURCE	INDICATORS AND RECORDERS	YES	YES	INSTALLED	SEE NOTE 12
C12. CONTAINMENT AND BRYWELL OXYGEN CONCENTRATION	1	YES	SEIS A	QA A	2 CH.	0-25%	1E SOURCE	INDICATORS	YES	YES	INSTALLED	
C13. CONTAINMENT EFFLUENT RADIOACTIVITY NOBLE GASES (From Identified Release Points Including Standby Gas Treatment System Vent) (C15, E4)	3	YES	NO	QA A	2 CH.	10E0-10E12 UC/S	INSTR AC	INDICATORS AND RECORDERS	YES	YES	INSTALLED	IMPLEMENED AS A CAT. 2 VARIABLE, 2 CHANNELS AT BOTH THE OFF-GAS STACK AND REACTOR BUILDING VENT
C14. RADIATION EXPOSURE RATE (E2, E3) (Inside Buildings or Areas, E.G., Auxiliary Building, Fuel Handling Building, Secondary Containment, which are in Direct Contact with Primary Containment where Penetrations and Hatches are Located)	2	- SAME AS VARIABLE E3 -										IMPLEMENTED AS CATEGORY 3 VARIABLE, SEE NOTE 13
C15. EFFLUENT RADIOACTIVITY - NOBLE GASES (C13, E4)	2	- SAME AS VARIABLE C13 -										
CONDENSATE AND FEEDWATER SYSTEM												
D1. MAIN FEEDWATER FLOW	3	NO	NO	QA B	NO	0-118%	INSTR AC	INDICATORS AND RECORDER	YES	YES	INSTALLED	
D2. CONDENSATE STORAGE TANK LEVEL	3	NO	NO	QA B	NO	BOTTOM TO TOP	INSTR AC	INDICATORS	YES	YES	INSTALLED	

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC NOTE 5	SCHEDULE	COMMENTS
PRIMARY CONTAINMENT-RELATED SYSTEMS												
D3. SUPRESSION CHAMBER SPRAY FLOW (D8)	2	YES	SEIS B	QA A	NO	0-125%	INSTR AC	INDICATORS	YES	YES	1984 OUTAGE	QUALIFIED FLOW TRANSMITTERS AND CABLES TO BE INSTALLED. SAME INSTR. USED FOR BOTH DRYWELL AND SUPP. CHAMBER SPRAY FLOW
D4. DRYWELL PRESSURE (B7, B9, C8)	1	- SAME AS VARIABLE B7 - - - - - - - - - - - - - - - - - - -										
D5. SUPRESSION POOL WATER LEVEL (C7)	2	- SAME AS VARIABLE C7 - - - - - - - - - - - - - - - - - - -										IMPLEMENTED AS A CAT. 1 VARIABLE
D6. SUPRESSION POOL WATER TEMPERATURE (A2)	2	- SAME AS VARIABLE A2 - - - - - - - - - - - - - - - - - - -										IMPLEMENTED AS A CAT. 1 VARIABLE
D7. DRYWELL ATMOSPHERE TEMPERATURE	2	NO	NO	QA B	NO	0-600 DEG F	INSTR AC	RECORDER	YES	YES	INSTALLED	IMPLEMENTED AS A CAT. 3 VARIABLE. SEE NOTE 14.
D8. DRYWELL SPRAY FLOW (D3)	2	- SAME AS VARIABLE D3 -										
MAIN STEAM SYSTEM												
D9. MAIN STEAMLINE ISOLATION VALVES LEAKAGE CONTROL SYSTEM PRESSURE	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NONE	NOT IMPLEMENTED NOT PART OF MONTICELLO DESIGN
D10. PRIMARY SYSTEM SAFETY RELIEF VALVE POSITION, INCLUDING ADS OR FLOW THROUGH OR PRESSURE IN VALVE LINES	2	YES	NO	QA A	NO	CLOSED/OPEN	INSTR AC	INDICA LITES	YES	YES	INSTALLED	PRESSURE SENSORS IN DISCHARGE LINE
SAFETY SYSTEMS												
D11. ISOLATION CONDENSOR SYSTEM SHELL-SIDE WATER LEVEL	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NONE	NOT IMPLEMENTED, ISO CONDENSER NOT PART OF MONTICELLO DESIGN
D12. ISOLATION CONDENSER SYSTEM VALVE POSITION	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NONE	NOT IMPLEMENTED, ISO CONDENSER NOT PART OF MONTICELLO DESIGN
D13. RCIC FLOW	2	MILD	NO	QA B	NO	0-125%	INSTR AC	INDICATOR	YES	YES	INSTALLED	SEE NOTE 15

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC	SCHEDULE	COMMENTS
D14. HPCI FLOW	2	YES	SEIS B	QA A	NO	0-115%	INSTR AC	INDICATOR	YES	YES	INSTALLED	
D15. CORE SPRAY SYSTEM FLOW	2	YES	SEIS B	QA A	NO	0-165%	INSTR AC	INDICATORS	YES	YES	1984 REFUEL	QUALIFIED TRANSMITTERS AND CABLES WILL BE INSTALLED
D16. LPCI SYSTEM FLOW (D19)	2	YES	SEIS B	QA A	NO	0-125%	INSTR AC	INDICATORS AND RECORDER	YES	YES	1984 REFUEL	QUALIFIED TRANSMITTERS AND CABLES WILL BE INSTALLED
D17. SLCS FLOW	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NONE	NOT IMPLEMENTED, SEE NOTE 16
D18. SLCS STORAGE TANK LEVEL	2	MILD	NO	QA B	NO	300-3000 GAL	INSTR AC	INDICATOR	YES	YES	INSTALLED	SEE NOTE 16
RESIDUAL HEAT REMOVAL (RHR) SYSTEMS												
D19. RHR SYSTEM FLOW (D16)	2	---------- SAME AS VARIABLE D16 ----------										
D20. RHR HEAT EXCHANGER OUTLET TEMPERATURE	2	NO	NO	QA B	NO	0-600 DEG F	INSTR AC	RECORDER	YES	YES	INSTALLED	IMPLEMENTED AS A CAT 3 VARIABLE, SEE NOTE 17
COOLING WATER SYSTEM												
D21. COOLING WATER TEMPERATURE TO ESF SYSTEM COMPONENTS	2	NO	NO	QA B	NO	0-600 DEG F	INSTR AC	RECORDER	YES	YES	1985 REFUEL	INTERPRETED AS THE RHR SERVICE WATER SYSTEM - IMPLEMENTED AS A CAT 3 VARIABLE SEE NOTE 18
D22. COOLING WATER FLOW TO ESF SYSTEM COMPONENTS	2	NO	NO	QA B	NO	0-140%	INSTR AC	INDICATOR	YES	YES	INSTALLED	INTERPRETED AS RHR SERVICE WATER FLOW - IMPLEMENTED AS A CATEGORY 3 VARIABLE - SEE NOTE 18
RADWASTE SYSTEMS												
D23. HIGH RADIOACTIVITY LIQUID TANK LEVEL	3	NO	NO	QA B	NO	TOP TO BOTTOM	IE SOURCE	RECORDER	NO	NO	INSTALLED	INTERPRETED AS RADWASTE FLOOR DRAIN COLLECTOR TANK AND WASTE COLLECTOR TANK

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC	SCHEDULE	COMMENTS
VENTILATION SYSTEMS												
D24. EMERGENCY VENTILATION DAMPER POSITION	2	YES	NO	QA B	NO	OPEN/CLOSE	IE SOURCE	IND. LIGHTS	NO	NO	INSTALLED	SBGTS DAMPERS AND CONTROL ROOM VENTILATION DAMPERS
POWER SUPPLIES												
D25. STATUS OF STANDBY POWER AND OTHER ENERGY SOURCES IMPORTANT TO SAFETY (Hydraulic, Pneumatic)	2	MILD	SEIS B	QA B	NO	0-600 AMPS 0-5250 VAC 0-300 VDC 0-150 VDC	SOURCE POWERED	AMP & VOLT METERS	YES	YES	INSTALLED	SEE NOTE 19
CONTAINMENT RADIATION												
E1. PRIMARY CONTAINMENT AREA RADIATION HIGH RANGE (C5)	1	SAME AS VARIABLE C5										
E2. REACTOR BUILDING OR SECONDARY CONTAINMENT AREA RADIATION (C14, E3)	2	SAME AS VARIABLE E3										IMPLEMENTED AS CATEGORY 3 VARIABLE SEE NOTE 13
AREA RADIATION												
E3. RADIATION EXPOSURE RATE (E2,C14) (Inside Buildings or Areas where Access is Required to Service Equipment Important to Safety)	2	NO	NO	QA B	NO	.1-1000 MR/HR	INSTR AC	INDICATORS AND RECORDER	YES	YES	INSTALLED	IMPLEMENTED AS A CATEGORY 3 VARIABLE, SEE NOTE 13
AIRBORNE RADIOACTIVE MATERIALS RELEASED FROM PLANT												
E4. NOBLE GASES AND VENT FLOW RATE (C15, C13)	2	SAME AS VARIABLE C13										THE STACK AND REACTOR BUILDING VENT MONITORS MEASURE AND CAN DISPLAY BOTH VENT FLOW AND SAMPLE FLOW RATES

VARIABLE	R.G. CAT	ENV QUAL NOTE 1	SEIS QUAL NOTE 2	QUAL ASSUR NOTE 3	REDUND	RANGE	POWER SUPPLY NOTE 4	CR DISPLAY	TSC LOC NOTE 5	EOF LOC NOTE 5	SCHEDULE	COMMENTS
E5. PARTICULATES AND HALOGENS	3	NA	NA	NA	NA	10E-3uCi/CC TO 10E+2uCi/CC	NA	NA	NA	NA	INSTALLED	THE STACK AND REACTOR BUILDING VENT MONITORS HAVE PROVISIONS FOR COLLECTING SAMPLES FOR LAB ANALYSIS
ENVIRONS RADIATION AND RADIOACTIVITY												
E6. RADIATION EXPOSURE METERS (Continuous Indication at Fixed Locations)	NONE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NONE	NOT IMPLEMENTED, NO REQUIREMENT EXISTS
E7. AIRBORNE RADIOHALOGENS AND PARTICULATES (Portable Sampling With On-site Analysis Capability)	3	NA	NA	NA	NA	10E-9uCi/CC TO 10E-3uCi/CC	NA	NA	NA	NA	NA	ON SITE LAB ANALYSIS
E8. PLANT AND ENVIRONS RADIATION (Portable Instrumentation)	3	NA	NA	NA	NA	RG SPECS	NA	NA	NA	NA	NA	ON SITE PORTABLE INSTRUMENTS
E9. PLANT AND ENVIRONS RADIOACTIVITY (Portable Instrumentation)	3	NA	NA	NA	NA	MULTICHANNEL GAMMA-RAY SPECTROMETER	NA	NA	NA	NA	INSTALLED	PORTABLE SAMPLING WITH BACKUP COUNT ROOM FACILITIES AT THE EOF
METEOROLOGY												
E10. WIND DIRECTION	3	NO	NO	QA-A	YES	0-540 DEG	NON 1E	NO	YES	YES	INSTALLED	WILL BE AVAILABLE IN CONTRGL RM VIA SPDS COMPUTER
E11. WIND SPEED	3	NO	NO	QA-A	YES	0-100 MPH	NON 1E	NO	YES	YES	INSTALLED	WILL BE AVAILABLE IN CONTROL RM VIA SPDS COMPUTER
E12. ESTIMATION OF ATMOSPHERIC STABILITY	3	NO	NO	QA-A	YES	-5 DEG C TO +5 DEG C dT	NON 1E	NO	YES	YES	INSTALLED	WILL BE AVAILABLE IN CONTROL RM VIA SPDS COMPUTER
ACCIDENT-SAMPLING CAPABILITY (Analysis Capability On-site)												
E13. PRIMARY COOLANT AND SUMP	3	NA	NA	NA	NA	RG SPECS	NA	NA	NA	NA	NA	IMPLEMENTED PRIMARY COOLANT ONLY. SEE NOTE 20.
E14. CONTAINMENT AIR	3	NA	NA	NA	NA	RG SPECS	NA	NA	NA	NA	NA	IMPLEMENTED WITH THE PASS SEE NOTE 20

GENERAL NOTES:

Two Type A variables have been identified based on a review of the existing abnormal procedures. These are: 1.) Reactor Water Level - used as criteria to initiate SBLC and stop ADS; and 2.) Suppression Pool Water Temperature - used as criteria to manually scram the reactor, initiate SBLC, and initiate suppression pool cooling. Revision 3 of the BWR Owners' Group Emergency Procedures Guidelines was also reviewed to identify potential Type A variables that would be incorporated into the new Emergency Operating Procedures. No additional Type A variables have been identified at this time.

R.G. 1.97 recommends that Category 1 circuits be separated in accordance with R.G. 1.75. The existing plant separation scheme does not fully meet this guide. The existing separation scheme will be utilized for Category 1 circuits (USAR Section 8.8).

R.G. 1.97 suggests that accident monitoring instrumentation be specifically identified to aid the operator during accident conditions. This will be addressed as a Human Factor Review Program issue, not as a specific R.G. 1.97 issue.

Note 1: ENVIRONMENTAL QUALIFICATION

A yes or no designation is made only for those variables having instrument(s) located in a harsh environment. The yes or no designation indicates instrument compliance with the requirements of 10 CFR 50.49. Instruments located in mild environments or those only required to operate in mild environments are designated as "mild".

Note 2: SEISMIC QUALIFICATION

Much of the instrumentation was designed, installed, and licensed prior to the existence of Regulatory Guide 1.100. The seismic design criteria for this instrumentation is described in the Monticello USAR (Section 7.10). Category 1 instrumentation qualified to this criteria is designated as "Seis B" in the table. Category 1 instrumentation designed and installed after the issuance of Regulatory Guide 1.100 that have been qualified to the Regulatory Guide criteria are designated as "Seis A" in the table.

Note 3: QUALITY ASSURANCE

Much of the instrumentation was designed, installed, and licensed prior to the regulatory guide program and the ANSI programs. All plant safety related instruments satisfy the quality assurance requirements accepted by the NRC as required industry practice at the time of their relative design and procurement.

These instruments are designated as "QA B" in the table. Instrumentation installed that satisfy the current industry QA requirements, as delineated in the Monticello USAR (Section 13A), are designated as "QA A". Although the QA Plan specifically applies to "Safety Related" structures, system and components, implementation if the plan does provide controls applicable to items considered "Important to Safety".

NOTE 4: POWER SUPPLY

The majority of plant instrumentation is powered from the instrument AC system as described in USAR Section 8.7. All of this instrument AC system is backed up by the on-site emergency diesel generators. A portion of the system includes an uninterruptible power supply powered from the 250 VDC battery to supply those instruments where interruptible power is not acceptable. Instruments supplied by the instrument AC system are listed as "INSTR AC".
Some instruments are powered from the reactor protection power supply system described in USAR Section 8.6. This is a non-1E interruptible supply with redundant 1E voltage and frequency protective relaying monitoring the output voltage. Instruments powered from this system are listed as "RPS".
Some instruments and indicators are powered from the plant 24 volt or 125 volt battery systems (described in USAR Section 8.5). These battery systems are equipped with battery chargers powered from the emergency diesel generator source. Instrument and indicators powered from these batteries are listed as "DC".
There are instruments that are powered directly from step-down transformers off the essential MCC's. These instruments are listed as "1E Source" in the table.
Those instruments that are powered from their source (i.e. voltmeters, amp-meters) are listed as "SOURCE POWERED" in the table. Those instruments that are powered from non-essential sources are listed as "NON-1E" in the table.

Note 5: TSC AND EOF

The method for providing data to the Technical Support Center (TSC) and Emergency Operations Facility (EOF) is with the Safety Parameter Display System (SPDS) computer. The schedule for completing implementation of the SPDS was agreed to in a July 20, 1983 meeting with the NRC Monticello Project Manager as six (6) months after startup of Cycle 12.

A "Yes" in these columns indicates that the information will be provided in the TSC or EOF in accordance with the schedule above. A "No" indicates that the information will not be provided in the TSC or EOF.

Note 6: NEUTRON FLUX

The existing neutron monitoring system (SRM/IRM/APRM) is considered acceptable even though cables and detectors inside the primary containment are not qualified for a LOCA environment. This system provides the control room operator with indication of neutron flux from startup to 100% power and also provides input to the reactor protection system. The system will provide indication of neutron flux for operational and design basis accident events except for design basis LOCA events. Under these conditions, the scram system is assumed to operate properly since the Standby Liquid Control System is not designed for LOCA events. However, a scram can be verified by diverse means such as:

a.) indication of scram relay operation
b.) scram valve position indication
c.) CRD scram accumulator low pressure indication
d.) Scram Discharge Volume high level alarms
e.) Indication of expected responses, i.e., makeup to the vessel, pressure decay, torus temperature rise, etc.

Note 7: COOLANT LEVEL IN REACTOR

Redundant, qualified level indication loops provide level indication from the bottom of the core support plate to the top end of the normal operating range (-335" to +65"). Only one qualified level indicator is provided for vessel floodup (to top of vessel including steam lines) since there is only one reactor vessel tap for this indication. It is felt that the above system is acceptable because:

a) The fuel zone to operating range level indication is sufficient to deal with design basis accidents.

b) Vessel floodup is called for as a contingency operation.

c) Modifications to the reactor level sensing line arrangement are being implemented to improve the accuracy of level instrumentation during a drywell temperature transient or reactor depressurization events, thereby reducing the probability of flood-up events.

Note 8: REACTOR PRESSURE

These two reactor pressure indicators are part of the feedwater control system and currently provide 0-1200 psig indication. The pressure transmitters and cables expected to be in a harsh environment will be upgraded to meet the environmental qualifications during the 1984 refueling outage. These loops will be isolated from the non-1E feedwater control system and re-scaled to 0-1500 psig during the 1985 refueling outage in conjunction with another scheduled modification to the feedwater control system.

Note 9: B8 - DRYWELL SUMP LEVEL
C6 - DRYWELL DRAIN SUMP LEVEL

Monticello has two drain sumps. One drain is the equipment drain sump, which collects identified leakage; the other is the floor drain sump, which collects unidentified leakage.

The drywell-sump level signal does not automatically initiate safety-related systems. Both sumps have level detectors that provide only the following nonsafety indications:

a. Continuous level indication
b. Rate of rise indication, or leak rate
c. High-level alarm (starts first sump pump)
d. High-high-level alarm (starts second sump pump)

In addition, timers are used to indicate the duration of sump pump operation and thereby permit the amount of leakage to be estimated.

Although the level of the drain sumps can be a direct indication of breach of the reactor coolant system pressure boundary, there is other instrumentation required by RG 1.97 that would indicate leakage in the drywell:

a. Drywell pressure -- variable D7, Category 1
b. Drywell temperature -- variable D7, Category 2
c. Suppression Pool Water Level -- variable A4, Category 1
d. Primary Containment Hydrogen -- variable C11, Category 1

Regulatory Guide 1.97 requires instrumentation to function during and after an accident. The drywell sump systems are deliberately isolated at the primary containment penetration upon receipt of an accident signal to establish containment integrity. This fact renders the drywell-sump-level signal irrelevant. Therefore, by design, drywell-level instrumentation serves no useful accident-monitoring function.

Note 10: PRIMARY CONTAINMENT ISOLATION VALVE POSITION

Each primary containment isolation valve is equipped with a single channel position indication scheme. However, there are two isolation valves in series at each primary containment penetration, either of which will accomplish the required isolation. Therefore, the control room operator can verify proper isolation by observing the indication of the redundant valve should the position indication on any valve fail. It is felt that this arrangement satisfies the intent of the Reg. Guide.

Note 11: C1 - RADIOACTIVITY CONCENTRATION OR RADIATION LEVEL IN CIRCULATING PRIMARY COOLANT

The instrumentation for measuring variable C1 has been classified as Category 3, because no planned operator actions are identified and no operator actions are anticipated based on this variable serving as the key variable. Existing Category 3 instrumentation is adequate for monitoring fuel cladding status.

The usefulness of the information obtained by monitoring the radioactivity concentration or radiation level in the circulating primary coolant, in terms of helping the operator in his efforts to prevent and mitigate accidents, has not been substantiated. The critical actions that must be taken to prevent and mitigate a gross breach of fuel cladding are (1) shut down the reactor and (2) maintain water level. Additional operator actions to prevent fuel barriers being challenged, other than those based on Type A and B variables, have not been identified.

The Regulatory Guide specifies measurement of the radioactivity of the circulating primary coolant as the key variable in monitoring fuel cladding status during isolation of the NSSS. Monitors in the condenser off-gas and main steam lines provide reliable and accurate information on the status of fuel cladding when the plant is not isolated. After isolation of the NSSS, the post-accident sampling system will provide an accurate status of coolant radioactivity, and hence cladding status, once the post-accident sampling system is activated. In the interim between NSSS isolation and operation of the post-accident sampling system, monitoring of the primary containment radiation will provide information on the status of the fuel cladding.

Note 12: CONTAINMENT AND DRYWELL HYDROGEN CONCENTRATION

The installed hydrogen analyzers have a detection range of 0-20% hydrogen. Although not the suggested range, the installed monitors satisfy the intent of the Reg. Guide in that they do detect the potential for a breach of the containment by measuring hydrogen concentration well into the explosive range.

Note 13: RADIATION EXPOSURE RATE

Radiation exposure rate in the secondary containment will be largely a function of radioactivity in the primary containment and in fluids flowing through the ECCS piping which will cause direct radiation shine on the area monitors. It is doubtful if the area monitors can provide an indication of a containment break or leakage under these conditions. The stack and reactor building vent radiation monitors (variable C13) provide positive evidence of a break or leakage. Therefore, this item is being implemented as a Category 3 variable.
It is felt that the range of the existing area radiation monitoring system is acceptable because:

a.) the range is adequate for normal operation and wide enough to use as criteria for local evacuation
b.) under emergency conditions, entries past the access control point are controlled by established emergency plan procedures
c.) the plant shielding design review (USAR Section 14.9) and readings from other instruments (Variable C.1, C.2, C.5, and C.13) allow personnel to make reasonable exposure estimates.

Note 14: DRYWELL ATMOSPHERE TEMPERATURE

The drywell temperature monitoring system consists of thermocouples at various points in the primary containment wired out to a temperature recorder in the control room. This system will indicate properly for normal operation, operational transients, and design basis accidents, which do not result in a harsh environment. For the harsh environment design basis accident (LOCA), drywell pressure (Category 1) can be used to determine the temperature.

Note 15: RCIC FLOW

The design basis for the RCIC system is to provide makeup to the vessel during loss of off-site and on-site AC power conditions (USAR Section 10.2.5). It is not designed for LOCA events, therfore the environment for the RCIC flow instrument is listed as "mild".

Note 16: SLCS FLOW

The SLC system is manually initiated. Flow-measuring devices were not provided for this system. The pump-discharge header pressure, which is indicated in the control room, will indicate SLC pump operation. Besides the discharge header pressure observation, the operator can verify the proper functioning of the SLCS by monitoring the following:

a. The decrease in the level of the boron solution storage tank
b. The reactivity change in the reactor as measured by neutron flux
c. The motor contactor indicating lights and pump discharge pressure.
d. Squib valve continuity indicating lights

The use of these indications is believed to be a valid alternative to SLCS flow indication.

The design basis for the SBLC system does not include operation during a LOCA or High Energy Line Break (HELB) event, therefore the environment for the SBLC instruments is listed as "mild".

Note 17: RHR HEAT EXCHANGER OUTLET TEMPERATURE

The RHR heat exchanger outlet temperature is measured by thermocouples wired to a temperature recorder in the control room. For non-harsh environments, this system will provide reliable temperature indication. For harsh environment conditions (LOCA and HELB), the suppression pool temperature monitoring system (Category 1) will provide indication of the cooling trend.

Note 18: COOLING WATER SYSTEM

Cooling water to the emergency system components is supplied by the normal service water system and the emergency service water system. Temperature is monitored by the process computer, and can be displayed in the conrol room. Flow is monitored by pressure alarms on the header. The computer is operated from the uninterruptible AC supply, and the annunciator system is powered from the 125V DC battery system so that service water system monitoring is available even during accident conditions. In the event of trouble, an operator can be dispatched to the intake structure since this area is accessible during DBA's. Therefore, with a highly reliable monitoring system, and the capability for manual verification, it is felt that Category 3 implementation is acceptable.

Note 19: STATUS OF STANDBY POWER

The 250V DC, 125V DC, and 24V DC battery systems are only provided with undervoltage alarms in the control room. This is deemed acceptable since the batteries are redundant and the battery rooms are accessable during DBA so that an operator can investigate alarm conditions.

Note 20: ACCIDENT SAMPLING CAPABILITY

The Post Accident Sampling System (PASS) will be utilized to sample the primary coolant, containment atmosphere, and suppression pool water (NSP commitment to NUREG 0737, Item II.B.3). During accident conditions, the drywell sumps are isolated, and these sumps will spill over into the suppression pool during LOCA events; therefore, drywell sump samples are not deemed necessary. Means are available in the radwaste building to sample water from the collector tanks and to control sump pumps if highly radioactive water is being transferred to the building.