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RECIP.NAME	RECIPIENT AFFILIATION
DENTON,H.R.	Office of Nuclear Reactor Regulation, Director
STOLZ,J.F.	Operating Reactors Branch 4

SUBJECT: Forwards addl info to aid in completion of review re NUREG-0737,Items II.F.1.4,II.F.1.5 & II.F.1.6,per 830110 ltr request & justification concerning Item II.F.1.5.Amend to 830318 Confirmatory Order requested.

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HAL B. TUCKER
VICE PRESIDENT
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TELEPHONE
(704) 373-4531

May 31, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
NUREG Item II.F.1.4 Containment Pressure Monitor
II.F.1.5 Containment Water Level Monitor
II.F.1.6 Containment Hydrogen Monitor

Dear Sir:

Enclosed in Attachment 1 is the additional information you requested by your January 10, 1983 letter. This information is submitted to aid in the completion of your review of our previous submittals concerning NUREG-0737 Items II.F.1.4, II.F.1.5, and II.F.1.6.

During the process of preparing this response to the NRC Request for Information, it was determined that an existing component of the containment water level monitoring system, the Reactor Building narrow range water level monitoring system, was not environmentally qualified. On May 24, 1983, as a result of further review, it was determined that this system did not meet the intent of Action Plan Item II.F.1.5, Clarification (1), which concerns environmental qualification as noted in Regulatory Guide 1.89. This Action Plan Item was included in a Confirmatory Order dated March 18, 1983 which states that continuous indication of containment water level be implemented and maintained. Duke considers that the intent of the Order is met by the existing containment water level monitoring system. Justification for this position is provided in Attachment 2. Nevertheless, an amendment to the Confirmatory Order of March 18, 1983 is requested to reflect the revised implementation dates found in Attachment 2.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

RLG/php
Attachment

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cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Mr. J. C. Bryant
NRC Resident Inspector
Oconee Nuclear Station

Mr. John F. Suermann
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

HAL B. TUCKER, being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this request for amendment to the NRC confirmatory of March 18, 1982 for the Oconee Nuclear Station; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

Hal B. Tucker

Hal B. Tucker, Vice President

Subscribed and sworn to before me this 31st day of May, 1983.

Sue C. Sherrill

Notary Public

My Commission Expires:

September 20, 1984

Response to Request for Additional Information on NUREG-0737 Items

Request: (1a) Please indicate any exceptions that you plan to take to the NUREG-0737 items in our scope of review. For each exception indicate (1) why you find it difficult to comply with this item, (2) how this exception will affect the monitor system accuracy, speed, dependability, availability, and utility, (3) if this exception in any way compromises the safety margin that the monitor is supposed to provide, and (4) any extenuating factors that make this exception less deleterious than it appears at face value.

Response: No exceptions are taken to the NUREG-0737 items concerning containment pressure monitoring, containment hydrogen monitoring, or containment water level monitoring. However, the current narrow range water level instrumentation is not environmentally qualified.

Request: (1b) Your letter of 3 Aug 81 from William O. Parker, Jr. (Duke) to Harold R. Denton (NRC) describes existing containment monitors, but describes little of the systems you propose to satisfy NUREG-0737 requirements. Please indicate which of the existing monitors you plan to use to satisfy NUREG-0737 requirements and which monitors will have to be added to satisfy NUREG-0737 requirements.

Response: The letter of August 3, 1981 was provided to justify delay in implementation of several NUREG-0737 requirements and was not intended nor required to provide descriptions of such systems.

a) II.F.1.4 Containment Pressure Monitor

The containment pressure monitoring system which has been added to satisfy the NUREG-0737 requirements consists of two redundant pressure transmitters with ranges of -5 to 175 psig. Each transmitter sends a signal to a receiver gauge located in the Control Room. In addition to the receiver gauge, one channel provides an input to a Control Room recorder.

b) II.F.1.5 Containment Water Level Monitor

The wide range containment water level monitoring system which has been added to satisfy the NUREG-0737 requirements consists of two redundant level transmitters with ranges of 0 - 15 FTWC*. Each transmitter sends a signal to a receiver gauge located in the Control Room. In addition to the receiver gauge, one channel provides an input to a Control Room recorder.

* Feet of water column

The existing sump water level monitoring system will be used as an interim narrow range water level instrument. In order to meet the environmental qualification requirements of NUREG-0737, a new narrow range water level monitoring system will be installed in the normal sump and the emergency sump. Current intentions are for each sump to have two redundant level transmitters with ranges of 0 to 3 FTWC for the emergency sump and 0 to 2 FTWC for the normal sump. Each transmitter will send a signal to a receiver gauge located in the Control Room. In addition to the receiver gauge, one channel will input to a Control Room recorder. These are preliminary plans and are subject to further design review.

c) II.F.1.6 Containment Hydrogen Monitor

Redundant containment hydrogen monitoring systems with a range of 0 - 10% hydrogen containment have been added to satisfy the NUREG-0737 requirements. Each analyzer supplies a signal to a Control Room receiver gauge. In addition to the receiver gauge, one analyzer provides an input to a Control Room recorder.

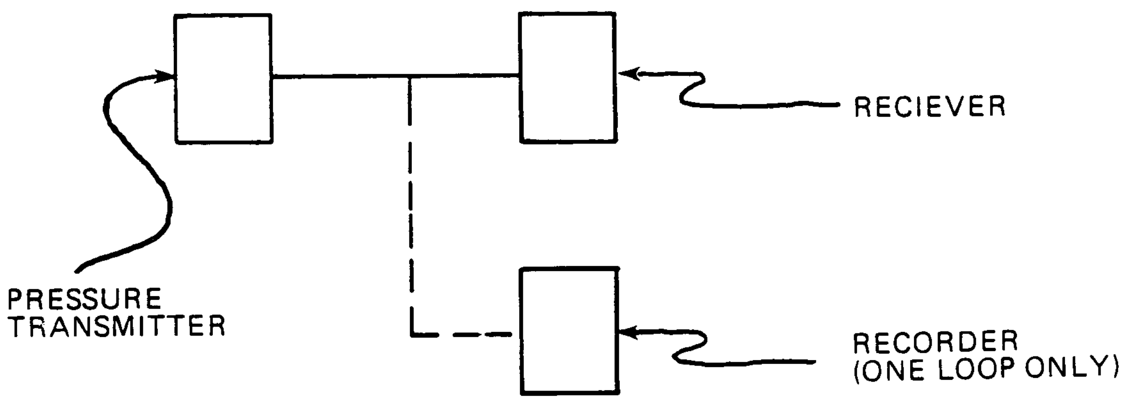
Request: (1c) In your letter of 3 Aug 81, you indicate that your hydrogen monitor is not automatic. Please indicate what actions your operator will have to take with this system that he would not have to take with an automatic system and how long these steps will delay the procurement of hydrogen concentration data.

Response: In 1981, there were no automatic hydrogen analyzers. The present containment hydrogen analyzers require an operator to turn the system on. The time required for the system to warm up is about 60 seconds. The operator may then choose the area inside containment from which the sample is to be taken.

(2) II.F.1.4 PRESSURE MONITORING SYSTEM (PMS) - ACCURACY & TIME RESPONSE

Request: (2a) Provide a block diagram of the configuration of modules that make up your PMS. Provide an explanation of any details in the block diagram that might be necessary for an understanding of your PMS accuracy and time response.

Response:



Request: (2b) For each module provide a list of all parameters* which describe the overall uncertainty in the transfer function of that module.

Response: Transmitter

Manufacturer: Rosemount
Model: 1153GA8
Range: -5 to 175 psig
Uncertainties associated with transmitter:

1) Random Bias ± .25% of calibrated span. Includes combined effects of hysteresis, repeatability, and linearity.

2) Temperature Effect ± 5.0% of span per 100°F.

3) Power Supply Effect .225% of output span.

Receiver

Manufacturer: Westinghouse
Model: VX-252
Uncertainties associated with receiver:

1) Random Bias ± 1.50% of full scale deflection

Recorder

Manufacturer: Westinghouse
Model: Optimac strip chart
Uncertainties associated with recorder:

1) Random Bias + .5% of full scale

2) Random Error + .1% of full scale

Request: (2c) Combine** parameters in 2b to get an overall system uncertainty. If you have both strip chart recorder and indicator output, give the overall system uncertainty for both systems. If you have systems spanning different ranges, give the overall system uncertainty for each system.

Response: 1) System including transmitter and receiver:

Overall System Uncertainty is ± 5.23%

2) System including transmitter, receiver, and recorder:

Overall System Uncertainty is ± 5.23% for the worst case using the transmitter and receiver. The accuracy of the transmitter and recorder will be better than the transmitter and receiver.

Request: (2d) For each module indicate the time response***. For modules with a linear transfer function, state either the time constant, τ, or the Ramp Asymptotic Delay Time, RADT. For modules with an output that varies linearly in time, state the full scale response time. (Most likely the only module you have in this category is the strip chart recorder.)

Response: Transmitter Response Time = $\leq$ 200 milliseconds

Receiver Response Time = 2.5 seconds

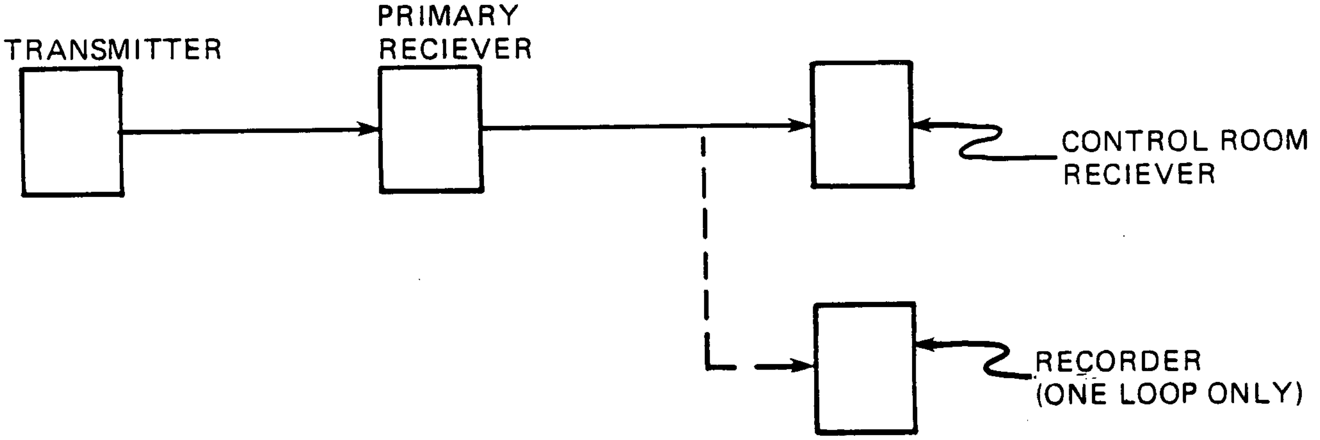
Recorder Response Time = 1 second for 100% step change

(3) II.F.1.5 - WATER LEVEL MONITORING SYSTEM (WLMS) - ACCURACY

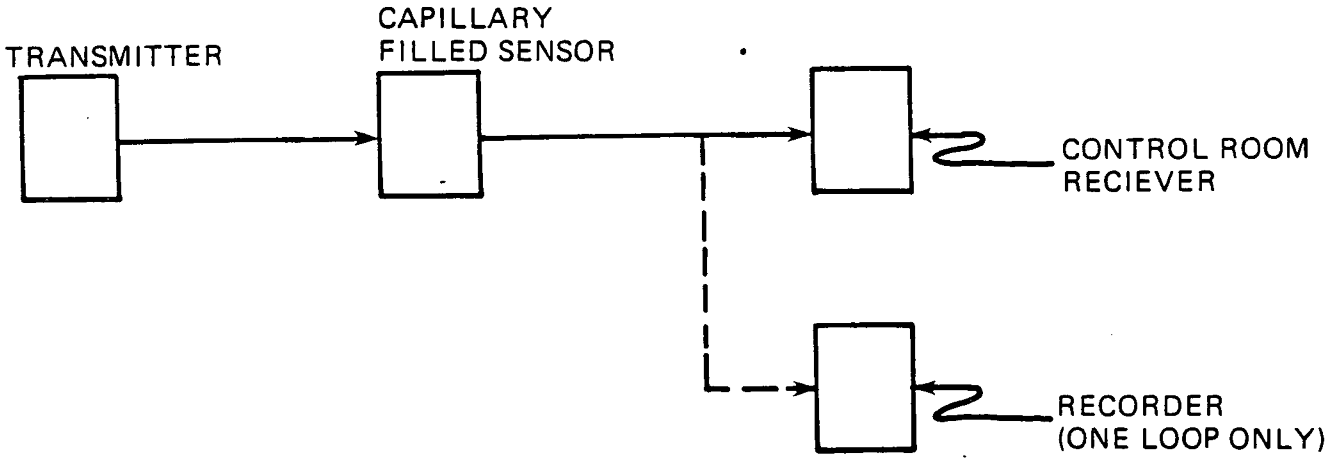
Request: (3a) Provide a block diagram of the configuration of modules that make up your WLMS. Provide an explanation of any details in the block diagram that might be necessary for an understanding of your WLMS accuracy.

Response:

WIDE RANGE SYSTEM



NARROW RANGE SYSTEM



Request: (3b) For each module provide a list of all parameters* which describe the overall uncertainty in the transfer function of that module.

Response: Wide-range Water Level Monitoring System

Transmitter

Manufacturer: Transamerica Delaval, Inc. Gems Sensor Division System consists of one type XM-60620 bottoming transmitter and one type XM-60625 transmitter located inside the reactor building and a type RE-36562 primary receiver located in the cable room.
Uncertainties associated with transmitter:

Non-accumulative accuracy: ± .3%
Power supply effect: ± .5%
Temperature effect: ± .5%

Receiver

Manufacturer: Westinghouse
Model: VX-252
Uncertainties associated with receiver:

1) Random Bias ± 1.50% of full scale deflection

Recorder

Manufacturer: Westinghouse
Model: Optimac strip chart
Uncertainties associated with recorder:

1) Random Bias + .5% of full scale

2) Random Error + .1% of full scale

Proposed Narrow Range Water Level Monitoring System:

Transmitter

Manufacturer: Barton
Model: 764 differential pressure transmitter
Accuracy: Reference accuracy: ± .5% of span
Sensitivity: ± .01 of span
Load Effect: ± .05% of span per 100 ohm change
Power Supply Effect: ± .0025% of span per 1 vdc change
Thermal Effect: + .5% of span per 50°F change
Overpressure Effect: ± .5% of span per 1000 psig

Sealed Capillary Sensor

Manufacturer: Barton
Model: 351
Accuracy: ± 1%

Receiver

Manufacturer: Westinghouse
Model: VX 252
Random Bias ± 1.50% of full scale deflection

Recorder

Manufacturer: Westinghouse
Model: Optimac strip chart
Uncertainties:

1) Random Bias + .5% of full scale
2) Random Error + .1% of full scale

Request: (3c) Combine** parameters in 3b to get an overall system uncertainty. If you have both strip chart recorder and indicator output, give the overall system uncertainty for both systems. If you have systems spanning different ranges, give the overall system uncertainty for each system.

Response: Wide Range Level System Uncertainty

1) System including transmitter and receiver:

Overall system uncertainty is ± 1.68%

2) System including transmitter, receiver, and recorder:

Overall system uncertainty is ± 1.68% for the worst case using the transmitter, receiver, and recorder

Narrow Range Level System Uncertainty

1) System including transmitter and receiver:

Overall system uncertainty is ± 2.0%

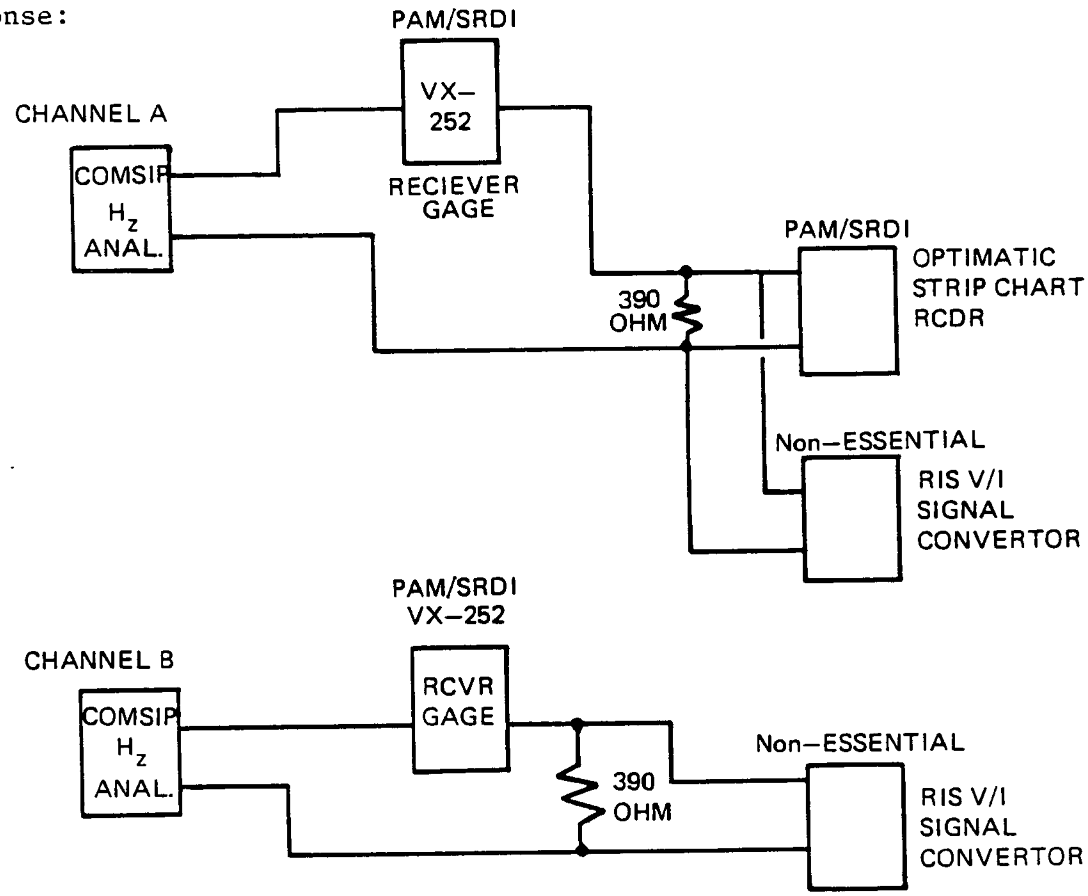
2) System including transmitter, receiver, and recorder:

Overall system uncertainty is ± 2.00% for the worst case using the transmitter, receiver, and recorder.

(4) II.F.1.6 - HYDROGEN MONITOR SYSTEM (HMS) - ACCURACY & PLACEMENT

Request: (4a) Provide a block diagram of the configuration of modules that make up your HMS. Provide an explanation of any details in the block diagram that might be necessary for an understanding of your HMS accuracy. If you have different types of HMS give this information for each type.

Response:



Request: (4b) For each module provide a list of all parameters* which describe the overall uncertainty in the transfer function of that module.

Response: Analyzer

Manufacturer: Comsip, Inc. Delphi Systems Division
Model: K-111
Range: 0 - 10%
Uncertainties associated with analyzers:

Electronics Accuracy: ± 1% full scale
Calibration Gas Accuracy: ± 2% full scale
Inaccuracy due to flow: ± 1% full scale
Transducer System Calibration Accuracy: ± .5% full scale
Random Error: ± .5% full scale

Receiver

Manufacturer: Westinghouse
Model: VX-252
Uncertainties associated with receiver:

1) Random Bias ± 1.50% of full scale deflection

Recorder

Manufacturer: Westinghouse
Model: Optimac Strip Chart
Uncertainties associated with recorder:

1) Random Bias + .5% of full scale
2) Random Error + .1% of full scale

Request: (4c) Combine** the parameters in 4b to get an overall system uncertainty. If you have both strip chart recorder and indicator output, give the overall system uncertainty for both systems.

Response: 1) System including analyzer and receiver:

Overall system uncertainty is ± 2.96%

2) System including analyzer, receiver, and recorder:

Overall system uncertainty is ± 2.96% for the worst case using the analyzer and receiver. The accuracy of the analyzer and recorder will be better than the analyzer and receiver.

Request: (4d) Indicate the placement and number of hydrogen monitor intake ports in containment. Indicate any special sampling techniques that are used either to examine one region of containment or to assure that a good cross section of containment is being monitored.

Response: Ten Hydrogen Analyzer intake parts are installed, (two each)** in the following locations:

a) The top of the Containment Building Dome, Elevation 983' ± 5"
b) The operational level as close to the vessel as practical, Elevation 844 + 0" ± 10'
c) The basement area, Elevation 788' + 0" ± 10'
*d) The radiation monitor/hydrogen recombiner inlet header, Elevation 827' + 4"
e) The radiation monitor/hydrogen recombiner outlet header, Elevation 824' + 0"

*One inlet header is open to branches at six different levels on a stack header in containment. The other inlet header is open only to containment atmosphere at 827' + 4" level. The former will normally be in operation.

**Redundant parts and sample lines from each location were provided. A minimum separation of 18 inches was provided between redundant paths.

From the analyzer control panel(s), the operator may select any one of the five intake ports locations from either of the two redundant trains. Only one port may be opened at any one time.

The Reactor Building cooling units may be used after an accident to ensure adequate mixing of the containment atmosphere.

Request: (4e) Are there any obstructions which would prevent hydrogen escaping from the core from reaching the hydrogen sample ports quickly?

Response: No

Attachment 2

Duke Power Company's Discussion of Compliance to the NRC Confirmatory Order Pertaining to NUREG-0737 Item II.F.1.5

Duke Power Company (DPC) interpretation of NUREG-0737 Action Plan Item II.F.1.5, Containment Water Level Monitor, was that instrumentation be installed to adequately provide information for post-accident situations. The Oconee Nuclear Station pre-TMI design had installed Reactor Building (RB) water level monitors on two separate sumps (normal and emergency), that collect drainage in each containment for each unit. The normal sump has a 359 gallon capacity and dimensions of 4' x 6' x 2' deep. The purpose of this sump is to collect normal water leakage should it happen to occur from the Reactor Coolant System. The emergency sump has a 4040 gallon capacity and dimensions of 10' x 18' x 3' deep. Its purpose is to collect larger amounts of water that would occur only in an emergency situation. The suction lines for the low pressure injection tie in to this sump. Presently, there are two wide range water monitors, newly installed in the Reactor Building, that measure the water level from the RB floor to fifteen (15) feet above the RB floor. These meet the design and qualification criteria of Regulatory Guide 1.97. There is a narrow range water level monitor on the emergency sump that measures the water level from the sump bottom to seven (7) feet above the RB floor. The normal sump has a narrow range monitor that measures the water level from the sump bottom to thirty (30) inches above the sump floor. These narrow range monitors are non-safety grade and are not environmentally qualified for post-accident environment. If the narrow range monitors were not available, their principal function; to monitor for excessive RCS leakage; would be provided by the existing RB radiation monitors and the RCS inventory balance calculations. They are not required for post-accident mitigation.

Duke considers that the intent of the NRC Confirmatory Order of March 18, 1983 is met. The order states that continuous indication of containment water level be implemented and maintained. Oconee is presently able to continuously monitor the containment water level with the two qualified devices. Fulfilling the NUREG's original purpose, in the event of a severe accident, the wide range level instruments would function to provide water level indication in the Reactor Building. The lack of narrow range water level indication in the emergency sump, (and the normal sump), if the non-safety indication failed to function in a post-accident mode, is of minimal safety implication.

The lack of environmentally qualified narrow range level instrument was discussed with the NRC Project Manager on May 25, 1983. Based on this discussion, the NRC requested that a request for Amendment to the Confirmatory Order be submitted. Duke is preparing a modification package to install a qualified device to satisfy the specifics of Regulatory Guide 1.89. That system is described in Attachment 1 of this submittal. At present, we are unable to identify a firm schedule for full implementation. However, it is our intention to install qualified devices during the first refueling outage of each unit after July 1, 1984. This delay is necessary because of an approximate lead time of one year to procure the qualified devices. In the interim, Duke Power will rely on the existing water level transmitters in each Oconee Reactor Building. These include both the newly installed and qualified wide range level instruments as well as the original non-safety grade sump level monitors. Furthermore, DPC will investigate the circumstances related to this apparent failure to implement this TMI requirement. We will keep you informed of our progress.