REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
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RECIP.NAME RECIPIENT AFFILIATION
CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Forwards addl info requested 830407 re containment pressure monitor,containment water level monitor & containment hydrogen monitors installed per requirements of TMI Items II.F.1.4,II.F.1.5 & II.F.1.6.

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TITLE: OR Submittal: TMI Action Plan Rqmt NUREG-0737 & NUREG-0660

NOTES:NRR/DL/SEP 1cy. 05000244

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JOHN E. MAIER
Vice President

TELEPHONE
AREA CODE 716 546-2700

June 20, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: NUREG 0737, Items II.F.1.4, II.F.1.5, II.F.1.6
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

Your letter dated February 23, 1983 requested additional information concerning the containment pressure monitor, containment water level monitor and containment hydrogen monitors installed to meet post-TMI requirements. Your letter dated April 7, 1983 provided reference material which RG&E had requested concerning the evaluation techniques to be used for system reviews. The enclosure to this letter provides the additional information which you requested in February.

Very truly yours,

John E. Maier

J. E. Maier

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ROCHESTER GAS & ELECTRIC CORPORATION

REQUEST FOR ADDITIONAL INFORMATION ON NUREG-0737 ITEMS

II.F.1.4 CONTAINMENT PRESSURE MONITOR
II.F.1.5 CONTAINMENT WATER LEVEL MONITOR
II.F.1.6 CONTAINMENT HYDROGEN MONITOR

(1) EXCEPTIONS BEING TAKEN TO NUREG-0737 REQUIREMENTS

(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: Previous submittals (October 17, 1979, November 19, 1979, December 28, 1979, October 22, 1980, December 15, 1980, December 30, 1980, November 25, 1981, April 23, 1982) have described the equipment we have installed and identified exceptions to the NUREG 0737 positions. No exceptions other than those previously noted have been identified. There is a change to information which we previously provided concerning the hydrogen monitors. No accuracy requirement for the hydrogen monitoring system is specified in NUREG-0737 although RG&E previously stated that the systems would be accurate to $\pm$ 2% of the instrument range of 0 to 10% volume concentration of hydrogen. That statement was based upon the manufacturers specification for the equipment. It now appears that the uncertainty of the equipment may be as large as 10% of the monitored range. The accuracy of the system remains adequate, however, for its post-accident function, which is to provide an indication to the operators when it may be necessary to start the recombiners. Procedures can account for the uncertainty in system accuracy so that the recombiners are started at an appropriate time.

(1b) In your letter of December 15, 1980 from John E. Maier (RG&E) to Dennis M. Crutchfield (NRC), you indicate that containment pressure will not be recorded continuously, as required by NUREG-0737, but that recording will be initiated by a Safety Injection or Containment Isolation signal. We find this acceptable and we will not require any further justification from you on this point. Can the control room operator easily initiate and curtail pressure recording manually?

Response: Subsequent to our December 15, 1980 letter, the design of the containment pressure monitor has been modified to provide continuous pressure recording in accordance with the NUREG-0737 position.

(1c) In your letter of December 15, 1980 you indicate that your water level monitor has a capacity of 500,000 gallons, rather than 600,000 gallons as is indicated in NUREG-0737. We understand that the 500,000 gallon capacity is based on the total water inventory available for flooding the containment. We find the 500,000 gallon capacity acceptable and will not require further justification from you on this point.

Response: No response required.

(2) II.F.1.4 - PRESURE MONITORING SYSTEM (PMS) - ACCURACY AND TIME RESPONSE

(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: See Figure 1 for block diagram.

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

Response: The uncertainty of the transfer function of each module is a measure of random inaccuracy only.

(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:

Module Uncertainties (Ref. Fig. 1):

1A - ± 0.5% of span
1B - ± 0.5% of span
1C - ± 1.5% of span
1D - ± 0.5% of span

Uncertainty of Containment Pressure Indicator and Recorder

For conservatism, individual component uncertainties are summed algebraically.

Indicator Uncertainty = 0.5 + 0.5 + 1.5 = 2.5% of span

Recorder Uncertainty = 0.5 + 0.5 + 0.5 = 1.5% of span

(2d) For each module indicate the time response***.

For modules with a linear transfer function, state either the time constant 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:

Module Time Responses (Ref. Fig. 1):

1A - time constant = 0.478 seconds
1B - negligible
1C - 2.5 sec
1D - 0.2 sec

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

(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: See Figures 2 and 3 for block diagrams.

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

Response: The uncertainty of the transfer function of each module is a function of random inaccuracy only.

(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:

Narrow Range Containment Water Level (Ref. Fig. 2)

Module Uncertainties:

2A - $\pm$ 0.24% of span
2B - $\mp$ 0.25% of span
2C - $\mp$ 0.5% of span
2D - $\mp$ 1.5% of span
2E - $\mp$ 0.5% of span

Uncertainty of Indicator and Recorder

For conservatism, individual component uncertainties are summed algebraically.

Indicator Uncertainty = 0.24 + 0.25 + 0.5 + 1.5 = 2.49% of span

Recorder Uncertainty = 0.24 + 0.25 + 0.5 = 1.49% of span

Wide Range Containment Water Level (Ref. Fig. 3)

Note that the wide range WLMS at Ginna Station is composed of a series of level switches rather than a continuous level monitor. The switches are located at specific levels determined to be of importance for operator action and equipment protection.

Module Uncertainties:

3A thru E - actuation level = ± 1/2 inch
3F - Not applicable
3G - ± 0.5% of span

Uncertainty of Indicator and Recorder

The level indicator lights (module 3F) are labelled in inches of water; each light being actuated by one level switch. At the moment an indicator light is illuminated, the containment water level is ± 1/2 inch of the indicated level.

The recorder (module 3G) records level switch actuation only, therefore, at the moment a level switch is actuated, the containment water level is ± 1/2 inch of the recorded level.

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

(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 HMSs give this information for each type.

Response: See Figure 4 for block diagram.

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

Response: The uncertainty of the transfer function of each module is a measure of random inaccuracy only.

(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:

Module Uncertainties:

4A - ± 10% of span
4B - ± .25% of span

Uncertainty of Containment Hydrogen Recorder

Algebraically Sum Uncertainties. Spans are the same.

± 10% + ± .25% = ± 10.25%

Uncertainty as a % of the full 0-10% range.

(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: Ginna Station has two hydrogen sample ports in containment.

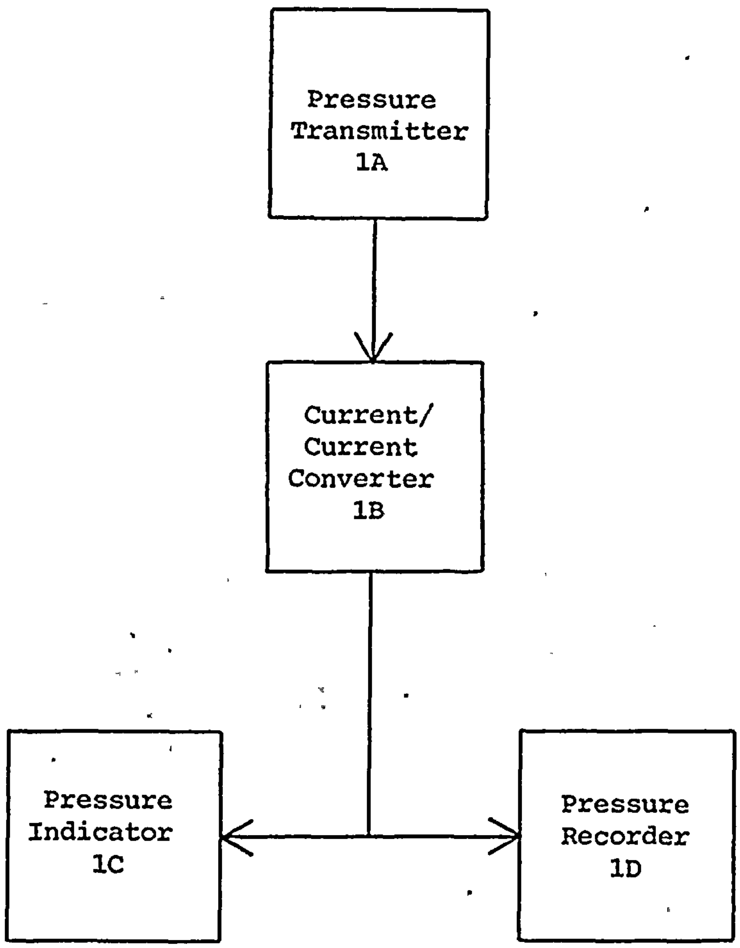
Elevation	Quadrant
256'3"	Northwest
256'3"	Northwest

No special sampling techniques are used.

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

Response: The only obstruction which would affect the time required for hydrogen to move from the core to the sample ports is the reactor coolant system pressure boundary. The degree of affect on the transport time of hydrogen depends on the magnitude of the loss of Coolant Accident (LOCA) and the location of the break. EPRI Report # NP-2669, Project 1932-8 entitled "Hydrogen Mixing and Distribution in Containment Atmospheres" further shows that there will be a good distribution of hydrogen in containment following a release of hydrogen. Factors contributing to a good mix would be momentum transfer from fluid jets, forced convection, and natural convection.

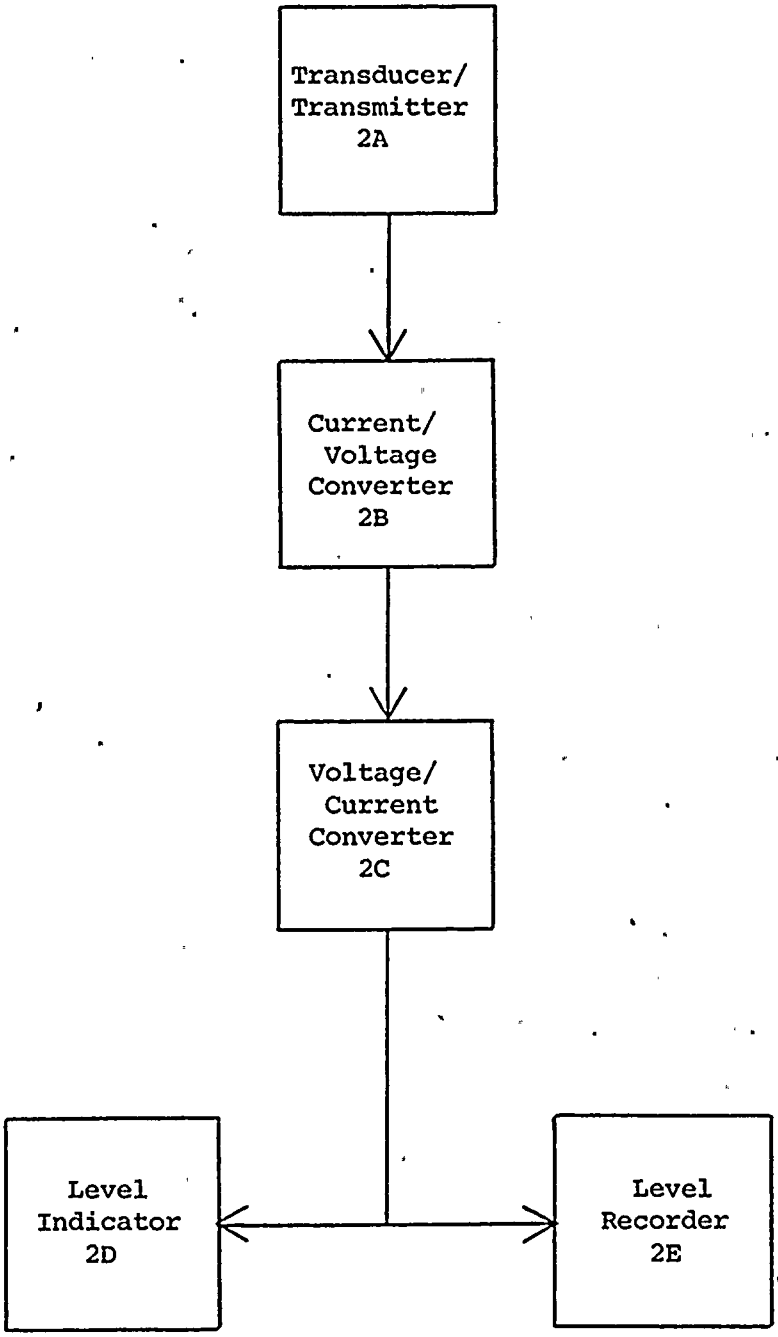
PRESSURE MONITORING SYSTEM



Range: 10-200 psia

FIGURE 1

CONTAINMENT
NARROW RANGE WATER LEVEL MONITORING SYSTEM



Range: 0-30 feet

FIGURE 2

CONTAINMENT

WIDE RANGE WATER LEVEL MONITORING SYSTEM

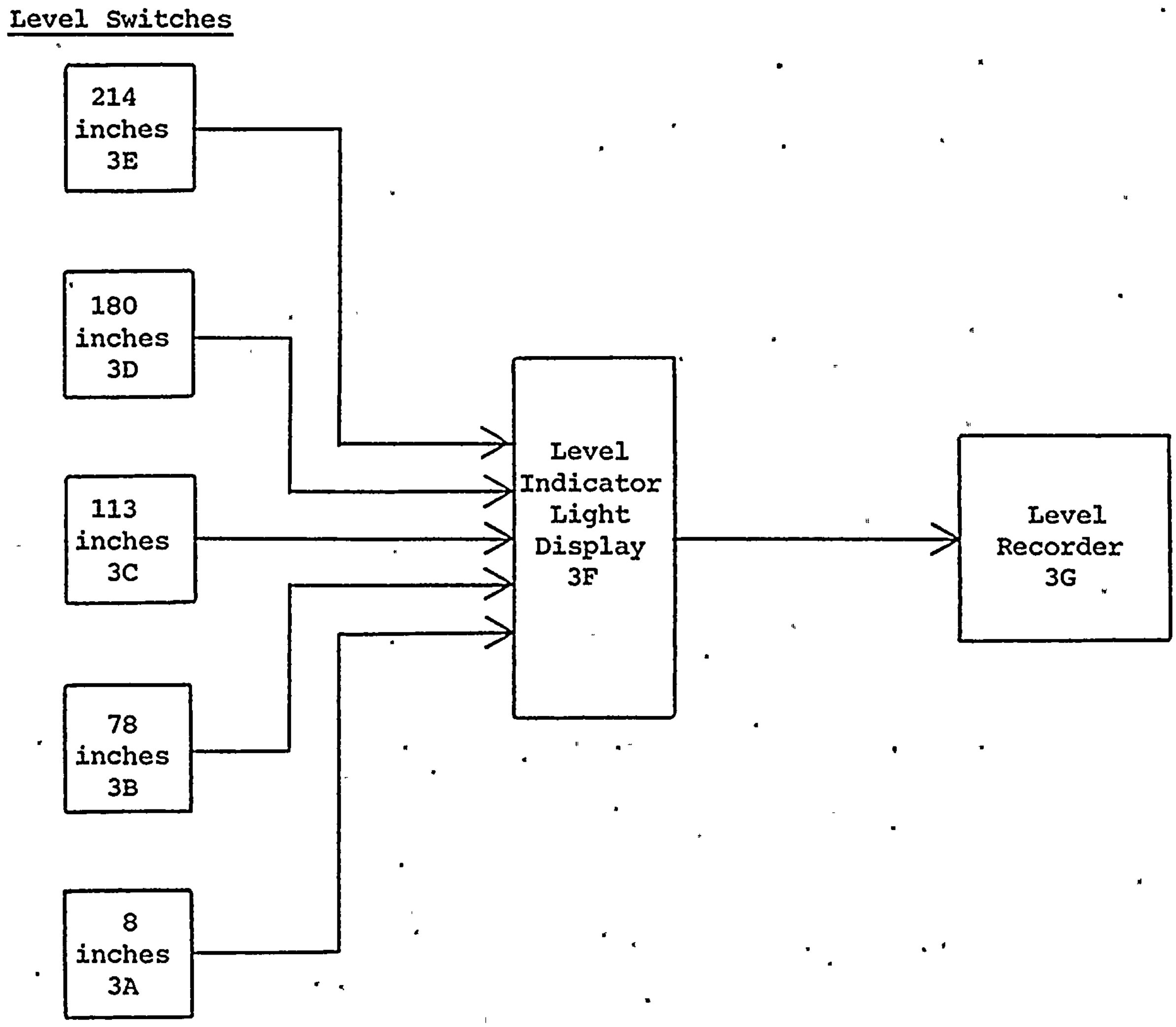
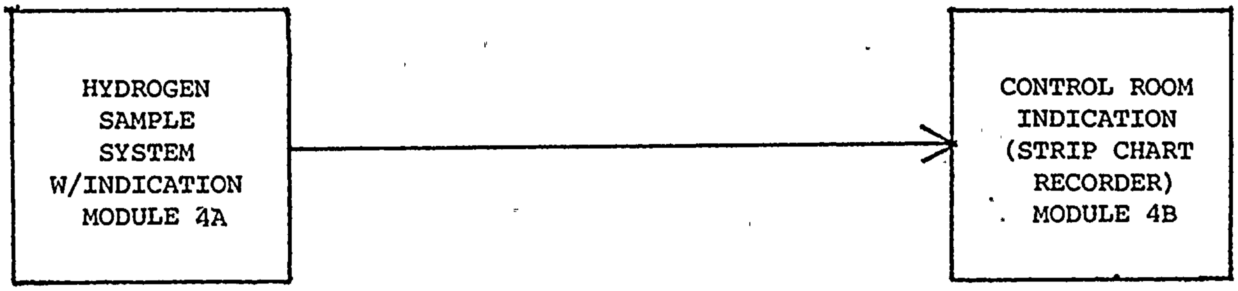


FIGURE 3

HYDROGEN MONITORING SYSTEM



RANGE: 0-10% H_2

FIGURE 4

[illegible]