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NED-83-252

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Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2
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

Gentlemen:

Your letter of December 17, 1982 requested that Georgia Power Company (GPC) provide additional information for the post-implementation review of the subject NUREG-0737 items. GPC hereby submits Enclosure 1 in response to this request.

Please contact this office if there are any questions.

Very truly yours,

J. T. Beckham, Jr.

JH/mb

Enclosure

A046

xc: H. C. Nix, Jr.
J. P. O'Reilly (NRC- Region II)
Senior Resident Inspector

ENCLOSURE 1
ADDITIONAL INFORMATION REGARDING 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

STAFF POSITION

(1) EXCEPTIONS BEING TAKEN TO NUREG 0737 REQUIREMENTS

(a) "Please indicate any exceptions that you plan to take to the NUREG 0737 items in the scope of our 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."

(b) "During the phone conversation on 13 Apr 82 between Bill Burns (GPC) and Peter Kapo (NRC), Bill Burns stated that the hydrogen monitor is activated by a Safety Injection signal, but is not initiated by simultaneous Safety Injection plus High Energy Steam Line Break signals. The logic was set up this way because hydrogen monitoring is only useful in the event of a LOCA. We accept this exception you are taking to the requirements of NUREG 0737 and will not require any further justification from you on this point."

RESPONSE

(a) No exceptions are taken to the criteria of NUREG 0737 Items II.F.1.4, II.F.1.5, or II.F.1.6. In our submittal dated December 15, 1980 it was noted that containment hydrogen monitors were already installed but that limited component replacement in response to I&E Bulletin 79-01B would be necessary. The necessary modifications have not yet been completed. The information provided in this submittal pertains to the monitors as they will be modified. The NRC will be promptly notified if any changes occur which affect the information contained in this submittal.

RESPONSE(cont.)

(b) The staff position, while correct in its conclusion, reflects a misinterpretation of the referenced April 13, 1982 discussion. The original exception to NUREG-0737 Item II.F.1.6 was addressed to the wording of Clarification (2) - "... continuous indication and recording shall be functioning within 30 minutes of initiation of safety injection." In a BWR there are occasions of safety injection (i.e., High Pressure Coolant Injection) which are activated by reactor vessel water level indication which do not require hydrogen monitoring capability. An example of such occasion is the High Energy Line Break (HELB) which will typically result in Main Steam Isolation Valve (MSIV) closure, pressure relief through Safety/Relief Valves (SRVs), lowered RPV water level and consequent HPCI injection. This incident of HPCI injection does not represent a situation which would result in the generation of hydrogen nor the associated need for monitoring. In fact, the HELB may involve environmental conditions for the hydrogen monitor for which it is not qualified.

The more appropriate criteria for the requirement for continuous indication and recording of hydrogen concentrations would be initiation within 30 minutes from potential hydrogen generation--core uncovery following a Loss of Coolant Accident (LOCA). In the event of a LOCA, the primary containment isolation system (PCIS) valves for systems such as the hydrogen monitor which penetrate the primary containment are automatically isolated. This condition makes the initiation of the monitor impractical at this point. Upon override of the PCIS by the operator, the sample suction and discharge valves for the hydrogen monitoring system automatically open and the instrument, if in the normal standby status, initiates monitoring. Operator action will initiate such processes so that continuous indication and recording are functioning within 30 minutes of the LOCA. Alternately, the monitor may be activated manually from its control panels. The analyzer system is qualified for the LOCA environment.

We feel that this system meets the requirements of Item II.F.1.6 and offer this as a point of clarification rather than exception.

STAFF POSITION

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

(a) "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."

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

(c) "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."

(d) "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)."

(e) "We will compute the overall system time response for you****."

RESPONSE

(a) Attachment A provides block diagrams of the configuration of modules that make up the PMS for Plant Hatch Units 1 and 2.

(b) The following is a list of all parameters used to compute the overall uncertainty in the transfer function of each module of the PMS instrument loops shown in Attachment A:

1. Rated accuracy
2. Repeatability
3. Power supply change effects
4. Hysteresis effect
5. Deadband effect
6. Calibration accuracy
7. Drift
8. Temperature change effects
9. Radiation effects
10. Seismic effects

The uncertainty derived from the effect of parameters 1 through 7 has been defined as the normal uncertainty. The maximum uncertainty also takes parameters 8 and 9 (for instruments located outside the Main Control Room) and 10 (for all instruments) into consideration to determine the uncertainty level resulting from a LOCA concurrent with a SSE. The repeatability, hysteresis, and deadband effects are considered individually only when they have not been previously included in the rated accuracy.

(c) The following tables list normal and maximum uncertainties for each PMS instrument loop at Plant Hatch Units 1 and 2. The uncertainties are expressed as a percentage of the full range of the modules. We have not presented the uncertainties in terms of standard deviations because we do not concur with the assumption that vendors have quoted accuracies based on data with normal density functions.

HNP-1 PMS Loop Uncertainties

INSTRUMENT LOOP DESCRIPTION	FULL RANGE PSIG	RECORDER UNCERTAINTY % OF FULL RANGE NORMAL	MAXIMUM
Wide Range Drywell Pressure	0 to 250	± 1.2%	± 10.7%
Mid Range Torus Pressure	-10 to 90	± 1.2%	± 8.7%
Mid Range Drywell Pressure	-10 to 90	± 1.2%	± 9.0%
Narrow Range Drywell Pressure	-10 to 10	± 1.2%	± 11.9%

HNP-2 PMS Loop Uncertainties

INSTRUMENT LOOP DESCRIPTION	FULL RANGE PSIG	INDICATOR UNCERTAINTY % OF FULL RANGE		RECORDER UNCERTAINTY % OF FULL RANGE	
		NORMAL	MAXIMUM	NORMAL	MAXIMUM
Wide Range Drywell Pressure	0 to 250	N/A	N/A	± 1.2%	± 10.7%
Narrow Range Drywell Pressure	-10 to 10	N/A	N/A	± 1.2%	± 11.9%
Mid Range Torus Pressure	-10 to 90	± 1.5%	± 8.7%	± 1.2%	± 8.7%
Mid Range Drywell Pressure	-10 to 90	± 1.5%	± 9.0%	± 1.2%	± 9.0%

Modifications are being considered to change the range of the narrow range drywell loops in both Units 1 and 2. If implemented, these modifications will have the following effect on both Units. The range will be -5 to 5 PSIG, the recorder normal uncertainty will be ± 1.5%, and the recorder maximum uncertainty will be ± 23.1%

(d) The following table provides time responses for the modules identified in the block diagrams of Attachment A. We have provided a single time response value for each type of module because instruments with identical model numbers (and time responses) are used. Time responses for the power supplies and signal converters are not provided because they operate instantaneously. These values apply to both Units 1 and 2.

HNP 1 and 2 Module Time Responses

	PRESSURE TRANSMITTER TIME CONSTANT	PRESSURE RECORDER FULL SCALE RESPONSE	PRESSURE INDICATOR TIME CONSTANT
Time Response	0.2 Sec.	1.0 Sec.	2.5 Sec.

STAFF POSITION

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

(a) "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."

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

(c) "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

(a) Attachment B provides block diagrams of the configuration of modules which make up the WLMS at Plant Hatch Units 1 and 2.

(b) The following is a list of all parameters used to compute the overall uncertainty in the transfer function of each module in the WLMS.

1. Rated accuracy
2. Repeatability
3. Power supply change effects
4. Hysteresis effect
5. Deadband effect
6. Calibration accuracy
7. Drift
8. Temperature change effects
9. Radiation effects
10. Seismic effects

The uncertainty derived from parameters 1 through 7 has been defined as the normal uncertainty. The maximum uncertainty also considers parameters 8 and 9 (for instruments located outside the Main Control Room) and 10 (for all instruments) to determine the uncertainty level resulting from a LOCA concurrent with a SSE. The repeatability, hysteresis, and deadband effects are considered individually only when they have not been previously included in the rated accuracy.

(c) The following table lists normal and maximum uncertainties for the WLMS instrument loops at Plant Hatch Units 1 and 2. These uncertainties are expressed as a percentage of the full range of the module. We have not expressed the uncertainty in terms of the standard deviation because we do not concur with the assumption that vendors have quoted accuracies based on data with normal density functions.

HNP 1 and 2 WLMS Loop Uncertainties

INSTRUMENT LOOP DESCRIPTION	FULL RANGE INCHES	INDICATOR UNCERTAINTY % OF FULL RANGE		RECORDER UNCERTAINTY % OF FULL RANGE	
		NORMAL	MAXIMUM	NORMAL	MAXIMUM
Wide Range Torus Water Level	0 to 300	± 3.0%	± 12.0%	N/A	N/A
Narrow Range Torus Water Level	0 to 30	N/A	N/A	± 1.0%	± 12.0%

The reference level for the wide range loops is the bottom of the Torus, although the lower instrument tap is actually located 21 1/4 inches above this level. The range requirement of Item II.F.1(6) is met, however, because the active range extends from below the lowest emergency core cooling system (ECCS) suction line inlet to greater than five feet above the normal Torus water level. The reference level for the narrow range loops is located 133 inches above the bottom of the Torus. A modification is being considered which would change the narrow range scale to 133 to 163 inches. If implemented, this modification would have no effect on the loop uncertainty.

STAFF POSITION

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

(a) "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."

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

(c) "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."

(d) "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."

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

RESPONSE

(a) Attachment C provides a block diagram of the configuration of modules that make up the HMS at Plant Hatch Units 1 and 2.

(b) Following is a list of all parameters used to compute the overall uncertainty in the transfer function of each module of the HMS.

1. Rated accuracy
2. Repeatability
3. Power supply change effects
4. Hysteresis effect
5. Deadband effect
6. Calibration accuracy
7. Drift
8. Temperature change effects
9. Radiation effects
10. Seismic effects

The uncertainty derived from the effects of parameters 1 through 7 has been defined as the normal uncertainty. The maximum uncertainty also considers parameters 8 and 9 (for instruments located outside the Main Control Room) and 10 (for all instruments) to determine the uncertainty level resulting from a LOCA concurrent with a SSE. The repeatability, hysteresis, and deadband effects are considered individually only when they have not been previously included in the rated accuracy

The following table lists the normal and maximum uncertainties for the HMS loops at Plant Hatch Units 1 and 2. The uncertainties are expressed as a percentage of the full range of the modules. We have not presented the uncertainties in terms of standard deviations because we do not concur with the assumption that vendors have quoted accuracies based on data with normal density functions.

HNP 1 and 2 HMS Loop Uncertainties

INSTRUMENT LOOP DESCRIPTION	FULL RANGE VOLUME %	INDICATOR UNCERTAINTY % OF FULL RANGE NORMAL	INDICATOR UNCERTAINTY % OF FULL RANGE MAXIMUM	RECORDER UNCERTAINTY % OF FULL RANGE NORMAL	RECORDER UNCERTAINTY % OF FULL RANGE MAXIMUM
Narrow Range Drywell/Torus H2	0 to 10%	± 4.4%	± 5.4%	± 3.8%	± 5.6%
Wide Range Drywell/Torus H2	0 to 50%	± 4.4%	± 5.4%	± 3.8%	± 5.6%

(d) Hatch Units 1 and 2 each have redundant hydrogen monitors. Each individual monitor is capable of sampling either drywell or torus atmosphere. Specific intake port locations are as follows:

HNP-1 "A" Monitor

Drywell Elevation 172'-6", Azimuth 217°
Torus Elevation 117'-0", Azimuth 0°

HNP-1 "B" Monitor

Drywell Elevation 193'-9", Azimuth 181.5°
Torus Elevation 117'-0", Azimuth 45°

HNP-2 "A" Monitor

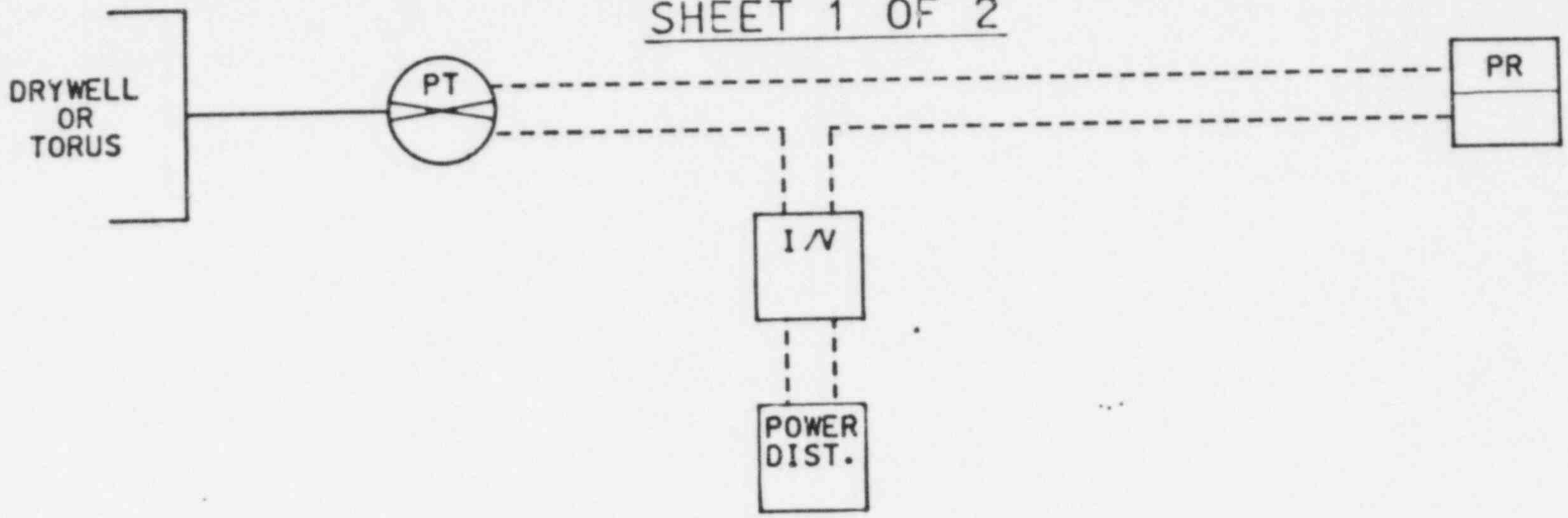
Drywell Elevation 143'-1 1/2", Azimuth 234°
Torus Elevation 117'-4", Azimuth 270°

HNP-2 "B" Monitor

Drywell Elevation 191'-7 1/2", Azimuth 180°
Torus Elevation 117'-2 1/2", Azimuth 180°

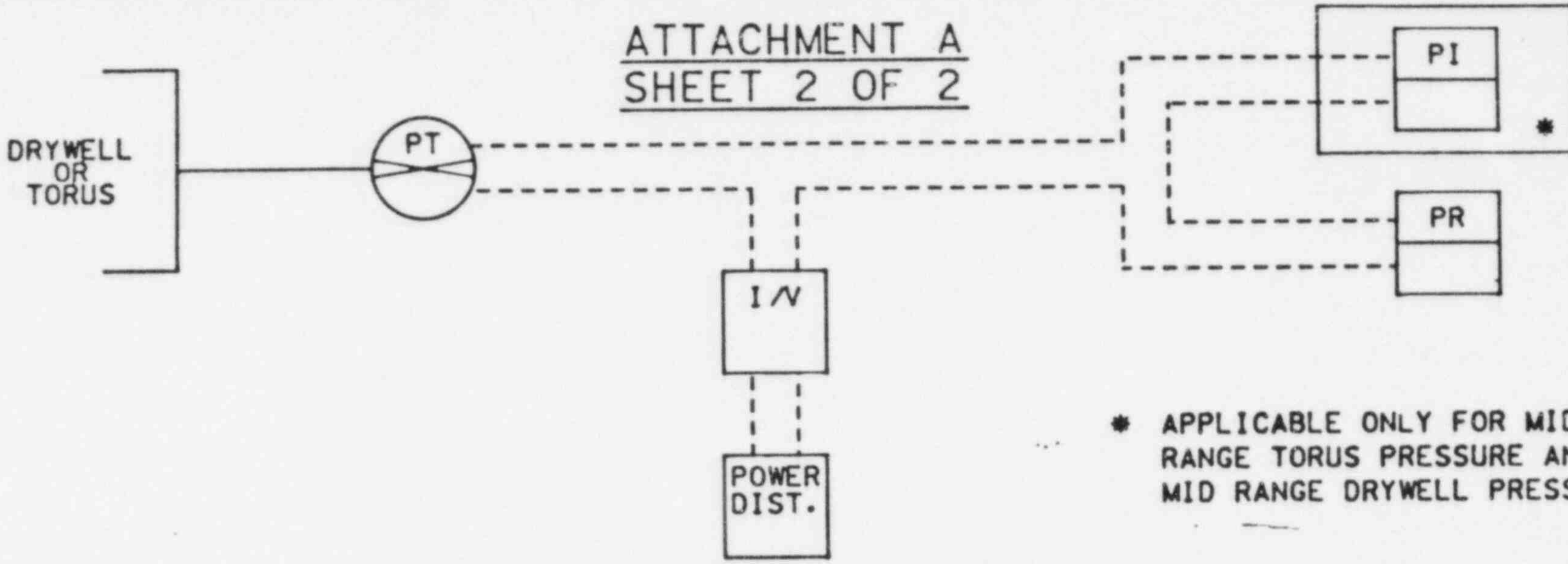
Hydrogen is not expected to collect in any particular region of the primary containment because the containment atmosphere will be well mixed following a LOCA. Representative sampling is therefore assured.

(e) There are no obstructions which would prevent hydrogen escaping from the core from quickly reaching the hydrogen sample ports.



PRESSURE TRANSMITTER (PT)	SIGNAL CONVERTER I/V	POWER DIST.	PRESSURE RECORDER (PR)	LOOP DESCRIPTION
QT48-PT-N003A	K605A	K604A	R601A	WIDE RANGE DRYWELL PRESSURE
QT48-PT-N003B	K605B	K604B	R601B	WIDE RANGE DRYWELL PRESSURE
QT48-PT-N008A	K609A	K604A	R608	MID RANGE TORUS PRESSURE
QT48-PT-N008B	K609B	K616	R609	MID RANGE TORUS PRESSURE
QT48-PT-N023A	K609A	K604A	R608	MID RANGE DRYWELL PRESSURE
QT48-PT-N023B	K609B	K616	R609	MID RANGE DRYWELL PRESSURE
QT48-PT-N020A	K608A	K604A	R607A	NARROW RANGE DRYWELL PRESSURE
QT48-PT-N020B	K608B	K616	R607B	NARROW RANGE DRYWELL PRESSURE

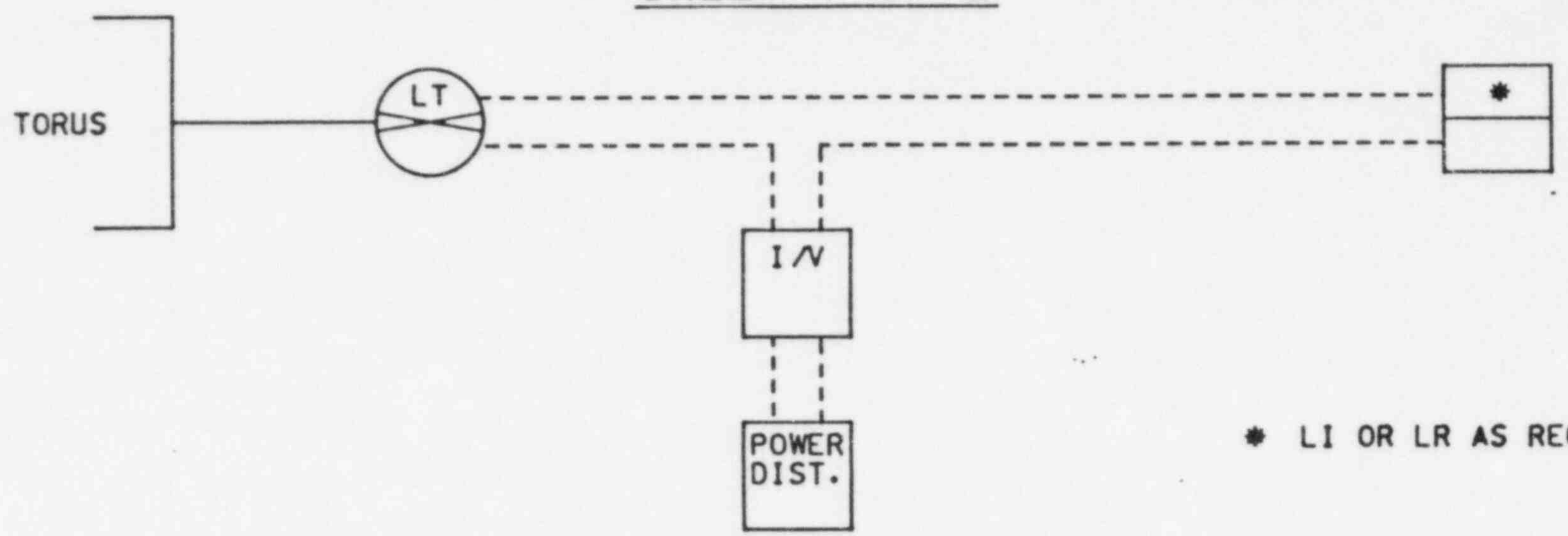
CONTAINMENT PRESSURE MONITOR LOOPS
HNP1



* APPLICABLE ONLY FOR MID RANGE TORUS PRESSURE AND MID RANGE DRYWELL PRESSURE

PRESSURE TRANSMITTER (PT)	SIGNAL CONVERTER I/V	POWER DIST.	PRESSURE RECORDER (PR)	PRESSURE INDICATOR (PI)	LOOP DESCRIPTION
Q2T48-PT-N003A	K605A	K604A	R601A	-	WIDE RANGE DRYWELL PRESSURE
Q2T48-PT-N003B	K605B	K604B	R601B	-	WIDE RANGE DRYWELL PRESSURE
Q2T48-PT-N020A	K608A	K604A	R607A	-	NARROW RANGE DRYWELL PRESSURE
Q2T48-PT-N020B	K608B	K622	R607B	-	NARROW RANGE DRYWELL PRESSURE
Q2T48-PT-N008A	K620A	K604A	R608	R632A	MID RANGE TORUS PRESSURE
Q2T48-PT-N008B	K620B	K622	R609	R632B	MID RANGE TORUS PRESSURE
Q2T48-PT-N023A	K620A	K604A	R608	R631A	MID RANGE DRYWELL PRESSURE
Q2T48-PT-N023B	K620B	K622	R609	R631B	MID RANGE DRYWELL PRESSURE

CONTAINMENT PRESSURE MONITOR LOOPS
HNP2

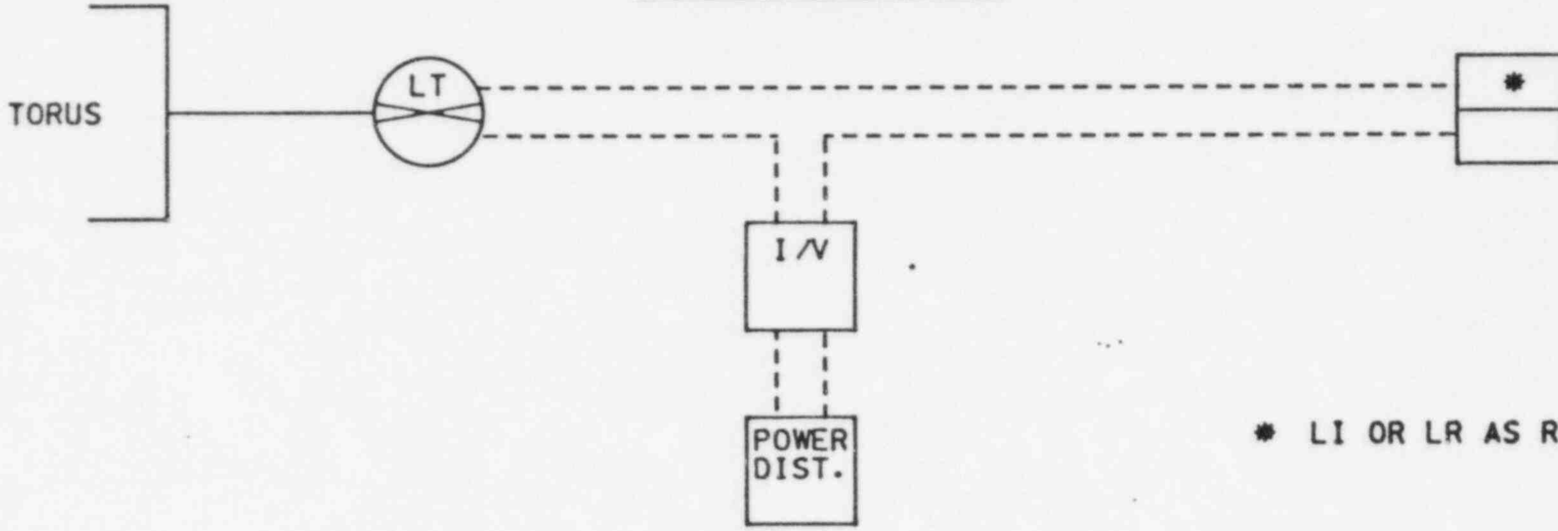


* LI OR LR AS REQUIRED

LEVEL TRANSMITTER (LT)	SIGNAL CONVERTER I/V	POWER DIST.	LEVEL RECORDER (LR)	LEVEL INDICATOR (LI)	LOOP DESCRIPTION
QT48-LT-N010A	K623A	K604A	-	R622A	WIDE RANGE TORUS WATER LEVEL
QT48-LT-N010B	K623B	K616	-	R622B	WIDE RANGE TORUS WATER LEVEL
QT48-LT-N021A	K623A	K604A	R607A	-	NARROW RANGE TORUS WATER LEVEL
QT48-LT-N021B	K623B	K616	R607B	-	NARROW RANGE TORUS WATER LEVEL

CONTAINMENT WATER LEVEL MONITOR LOOPS
HNP1

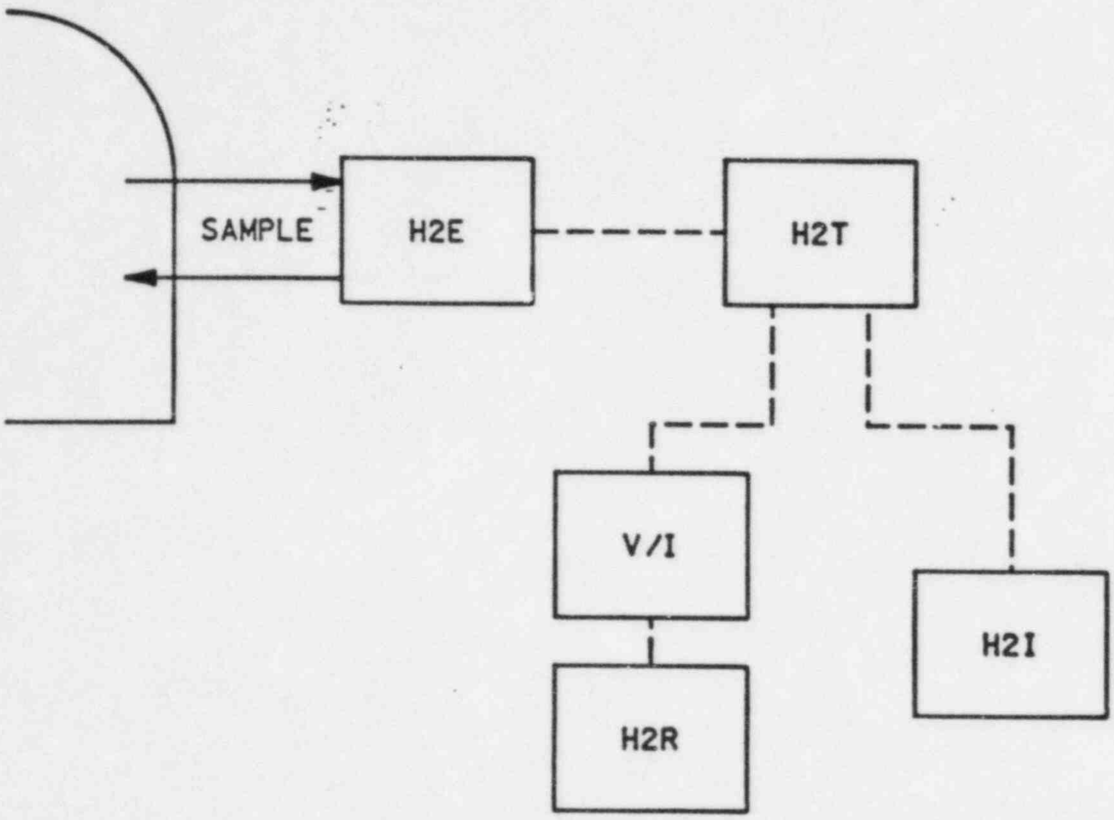
ATTACHMENT B
SHEET 2 OF 2



* LI OR LR AS REQUIRED

LEVEL TRANSMITTER (LT)	SIGNAL CONVERTER I/V	POWER DIST.	LEVEL RECORDER (LR)	LEVEL INDICATOR (LI)	LOOP DESCRIPTION
Q2T48-LT-N010A	K621A	K604A	-	R622A	WIDE RANGE TORUS WATER LEVEL
Q2T48-LT-N010B	K621B	K604B	-	R622B	WIDE RANGE TORUS WATER LEVEL
Q2T48-LT-N021A	K621A	K604A	R607A	-	NARROW RANGE TORUS WATER LEVEL
Q2T48-LT-N021B	K621B	K604B	R607B	-	NARROW RANGE TORUS WATER LEVEL

CONTAINMENT WATER LEVEL MONITOR LOOPS
HNP2



HNP	HYDROGEN SENSOR H2E	HYDROGEN TRANSMITTER H2T	SIGNAL CONVERTER V / I	HYDROGEN RECORDER H2R	HYDROGEN INDICATOR H2I	LOOP DESCRIPTION
1	QP33-H2E-N028A	N600A	K601A	R601A		DRYWELL/TORUS HYDROGE
	•	•	—	—	R604A	
	QP33-H2E-N028B	N600B	K601B	R601B		
	•	•	—	—	R604B	
2	Q2P33-H2E-N028A	N600A	K601A	R601A		
	•	•	—	—	R604A	
	Q2P33-H2E-N028B	N600B	K601B	R601B		
	•	•	—	—	R604B	

CONTAINMENT HYDROGEN MONITOR LOOPS
HNP - 1 AND 2