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DENTON,H.R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards Revision 4 to facility response to Task Force, Short-Term Lessons Learned requirements.

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PACIFIC GAS AND ELECTRIC COMPANY

PGandE 77 BEALE STREET, 31ST FLOOR • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211

April 11, 1980

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Phillips Building
7920 Norfolk Avenue
Bethesda, Maryland 20014

BY COURIER

Re: Docket No. 50-275
Docket No. 50-323
Diablo Canyon Units 1 and 2

Dear Mr. Denton:

Enclosed are 20 copies of the Revision 4 pages for the report entitled "Pacific Gas and Electric Company Response to NUREG-0578: Short-Term Lessons Learned Requirements."

This revision answers the comments of the NRR Short-term Lessons Learned Review Team that have not been previously addressed in revisions to the PGandE Response to NUREG-0578.

Twenty additional copies will be forwarded to you by regular mail and copies for the service list will be mailed not later than April 12, 1980.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it to me in the enclosed addressed envelope.

Very truly yours,

Philip A. Crane, Jr.

Enclosures

cc w/enc.: Service List

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INSTRUCTIONS FOR INSERTION OF
NUREG-0578 RESPONSE REVISION 4 PAGES

1. Replace the Rev. 0 pages indicated below with Rev. 4 pages:

   III-D-3, III-J-5, III-0-13, III-S-3

2. Add the Rev. 4 pages indicated below:

   III-D-4, III-0-14 through III-0-21, III-R-3, III-S-4

3. Replace the Rev. 1 pages indicated below with Rev. 4 pages:

   III-P-3

PACIFIC GAS AND ELECTRIC COMPANY

RESPONSE TO

NUREG-0578: SHORT TERM LESSONS LEARNED REQUIREMENTS

April 11, 1980

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4/11/80

Section 2.1.3.a (Continued)

The pressurizer PORV's have a position indicating system that complies with the Task Force Position and all clarifications except clarification 2. To comply with clarification 2, an alarm will be provided, and will be operative by May 1, 1980.

The position of the pressurizer safety valves will be measured with acoustic monitors manufactured by Technology for Energy Corporation (TEC). Readouts will be provided on the control board which give analog indications which will be correlated to valve positions. Precalibrated setpoints will be used to provide alarm of open valves.

The Safety Valve acoustic monitors will be calibrated using experimental data developed by the manufacturer. (EPRI Report NP1313, January 1980, Valve Position Indication Through Acoustic Monitoring of Steam Flow, by W. F. Hartman). The gain of the unit is set by the calculation:

$$G = 2.0 * F/(S*R)$$

Where G is the gain setting to use.
F is an engineering safety factor (2.0 per Diablo).
S is the tested sensitivity of the monitor components.
R is the RMS noise level for the particular valve (approximately 30 for Diablo).

It should be understood that this calibration will detect any significant leakage and an order of magnitude indication of valve opening. Since the manufacturer's data is not based on the same valve (Crosby 6" x 10" tested, Crosby 6" x 6" at Diablo), exact calibration for accurate flow measurements is not presently available.

Section 2.1.3.a (Continued)

Accelerometers, acting as acoustical sensors, are to be located on the discharge piping within six inches of the valve for sensing valve flow signals. High frequency (30 KHz) signals to which the accelerometers are sensitive are rapidly attenuated in the roughly 30 feet minimum of heavy piping and supports between each valve and the common header which is twice the diameter of the discharge piping. Due to the isolation which is provided by this arrangement, crosstalk has been shown in other plants, to generally be reduced by a factor of at least 100 so that the indication of an open valve would be readily distinguished from any noise introduced by an adjacent valve. Monitor gains are adjusted so that normal background noise levels do not influence position indications. Thus the effects of any feedback are minimized.

The monitors will be safety grade. Backup indication is provided by valve discharge temperature indicators on the main control board. Devices will be environmentally and seismically qualified to IEEE Standards No. 323-1974 and No. 344-1975. The manufacturers qualification program is scheduled to be completed in late 1980.

Installation is expected to be completed by June 1, 1980.

Section 2.1.6.a (Continued)

Containment spray recirc piping and valves outside containment are leak rate tested with precision volumetrics equipment at a 24 month interval as part of a containment isolation valve surveillance test.

Individual surveillance test procedures (STP) will be written for each system or each half system in the case of SIS and RHR. Each STP will list system boundary valves and specify test pressures. Each test will be performed prior to fuel loading, and at refueling outage intervals thereafter.

The portions of systems that will be monitored for leakage in this program are indicated on the attached piping schematics.

The initial leak test of the Gaseous Radwaste System has been completed. Test results are available for inspection at the Diablo Canyon site. Test procedures for the RHR and SIS tests have been written. Testing of the SIS has started, but is being temporarily delayed because of water supply problems. The test procedure for the NSSS Sampling system is currently being written. Overall, testing is about 60% complete. Testing is currently anticipated to be fully completed by May 1980.

Section 2.1.8.b (Continued)

HIGH RANGE CONTAINMENT MONITOR (HRCM):

Two mutually redundant HRCMs are provided at Diablo Canyon. Each monitor consists of a detector mounted inside containment about five feet above the operating deck at elevation 140, a readout module, and a strip chart recorder in the control room. The detectors are about 135 degrees apart on the containment liner to mitigate the effects of local "hot spots." The monitor units are powered from separate instrument power channels.

Each detector is a hermetically sealed stacked parallel plate, 3 terminal, guarded ionization chamber, operated in the saturated mode. The detector and its special cable are environmentally qualified to IEEE 323-1974.

Each readout has a range of 1 to 10^7 R/hr. and has high alarm, failure alarm, logarithmic scale, recorder output, and electronic system and detector checks.

The system is depicted in Figure 2.1.8.b-1.

PLANT VENT MONITORING SYSTEM:

All major, potentially radioactive, gaseous effluents from the plant pass through the plant vent. These include all ventilation exhausts (except control room and technical support center), containment purge, steam jet air

ejector, gland steam condenser exhaust, gaseous radwaste vent, gas decay tank vent, and waste evaporator vent. The only exceptions are the 10% steam dump exhausts and the blowdown tank. These are discussed at the end of this section.

Due to the varying levels of background and ability to discriminate at different dose rates, several ranges of plant vent monitors are provided.

The normal plant vent monitors detect noble gases to 10^{-4}uCi/cc, air particulates to 10^{-6}uCi/cc, and iodine to 10^{-7}uCi/cc. They are described in Section 11.4 of the Diablo Canyon FSAR.

The accident monitors are broken down into midrange and high level monitors.

The midrange monitor consists of an air particulate prefilter/grab sampler, an iodine monitor, and a noble gas monitor. The iodine monitor uses an iodine filter (either charcoal or silver zeolite) and a gamma scintillator with a single channel analyzer to monitor in the range of 10^{-8}uCi/cc to 10^{-1}uCi/cc. The noble gas monitor uses a beta scintillator to monitor in the range of 10^{-5}uCi/cc to 1uCi/cc. Both monitors have readouts in the control room which have indication, recorder output, high alarm, failure alarm, and check source operation. The unit has purge and bypass capability which can be operated either locally or from the control room. The system is depicted in Figure 2.1.8.b-2.

When the radiation level exceeds the trip limit of the midrange system, the system is automatically isolated (to minimize contamination) and the high range system is utilized. The high range system consists of a gross gamma monitor and an iodine sampler.

The gross gamma monitor consists of a shielded ion chamber mounted directly on the plant vent, a local readout at the access door to the vent ladder, and a control room readout. The readout has a range of 10^{-3}uCi/cc to 10^{+5}uCi/cc, and consists of an indicator, high alarm, failure alarm, recorder output, and electronic system and detector checks. The system is depicted in Figure 2.1.8.b-3.

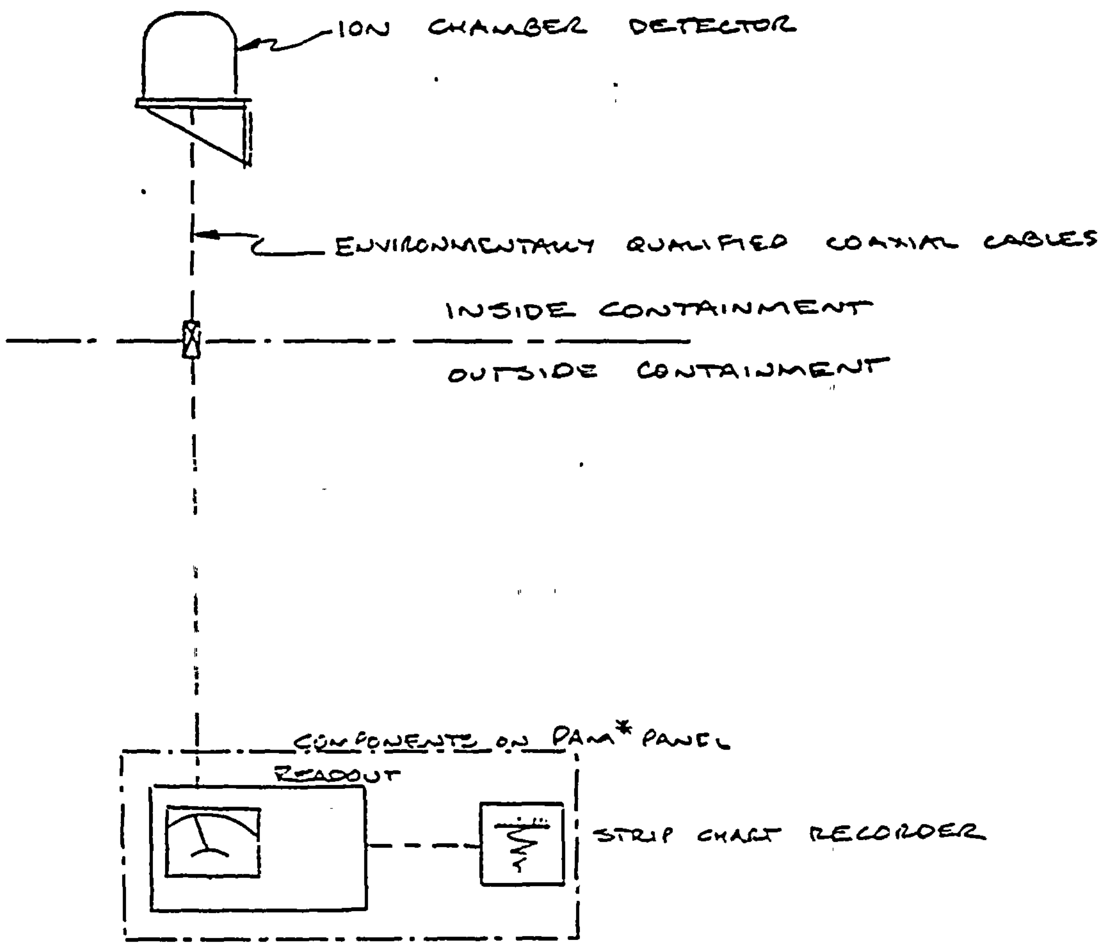
Should the radiation level rise to the range covered by this monitor, it would be impossible to detect iodine presence against the noble gas background. It would also be impossible to enter the monitor area to obtain a grab sample due to the high radiation shine from the vent itself. Therefore a separate iodine grab sampler is mounted in a remote location, shielded from the plant vent and containment. The system has particulate prefilters at the isokinetic probes in the plant vent, and sample lines which run to the sampler. The sampler consists on an iodine collection cannister holder and an air moving system. A lead transfer carriage is used to remove contaminated cartridges and transport them to the laboratory for analysis. The sampler has the capability to purge the iodine cannister and the sample line, as well as the capability to purge one prefilter while the other is in operation. These purges can either

be controlled locally or from the control room. Although the system is capable of operating continuously, it is envisioned for use as a timed, grab sampler only. It is depicted in Figure 2.1.8.b-4.

ALARA monitors are provided for all sample locations. They are depicted in Figure 2.1.8.b-5.

If PG&E's supplier meets current delivery date commitments, installation is expected to be completed by September 1, 1980, except for the iodine grab sampler which will be installed by November 1, 1980. For operation prior to September 1, 1980, PG&E will provide the necessary instrumentation and methods as required by the clarifications.

The only two potential release paths not using the plant vent are the 10% atmospheric steam dumps and the steam generator blowdown tank vent. There is a radiation monitor on the blowdown tank vent, but it has never worked properly. Several design changes have been made without resolution. Work is continuing on this problem. When a solution is found, the monitoring system will be implemented on the 10% steam dumps.



READOUT HAS HIGH ALARM AND FAILURE ALARM

*Post Accident Monitoring

ONE MONITOR IS SHOWN. THE REDUNDANT UNIT IS IDENTICAL.

Figure 2.1.8.b-1

CONTAINMENT HIGH RANGE
GROSS GAMMA MONITOR

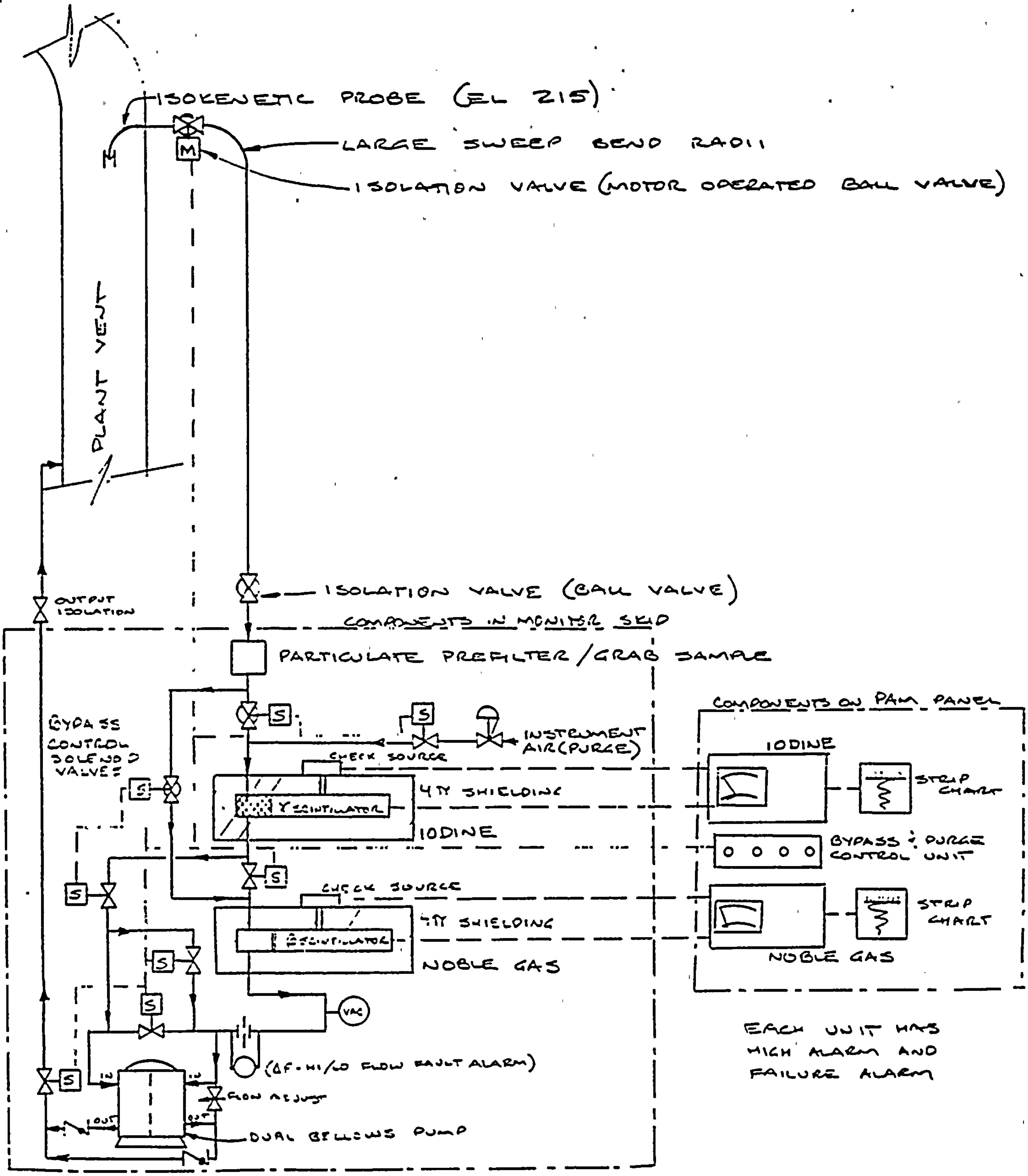


Figure 2.1.8.b-2
MID-RANGE IODINE AND
NOBLE GAS PLANT VENT
MONITORING SYSTEM

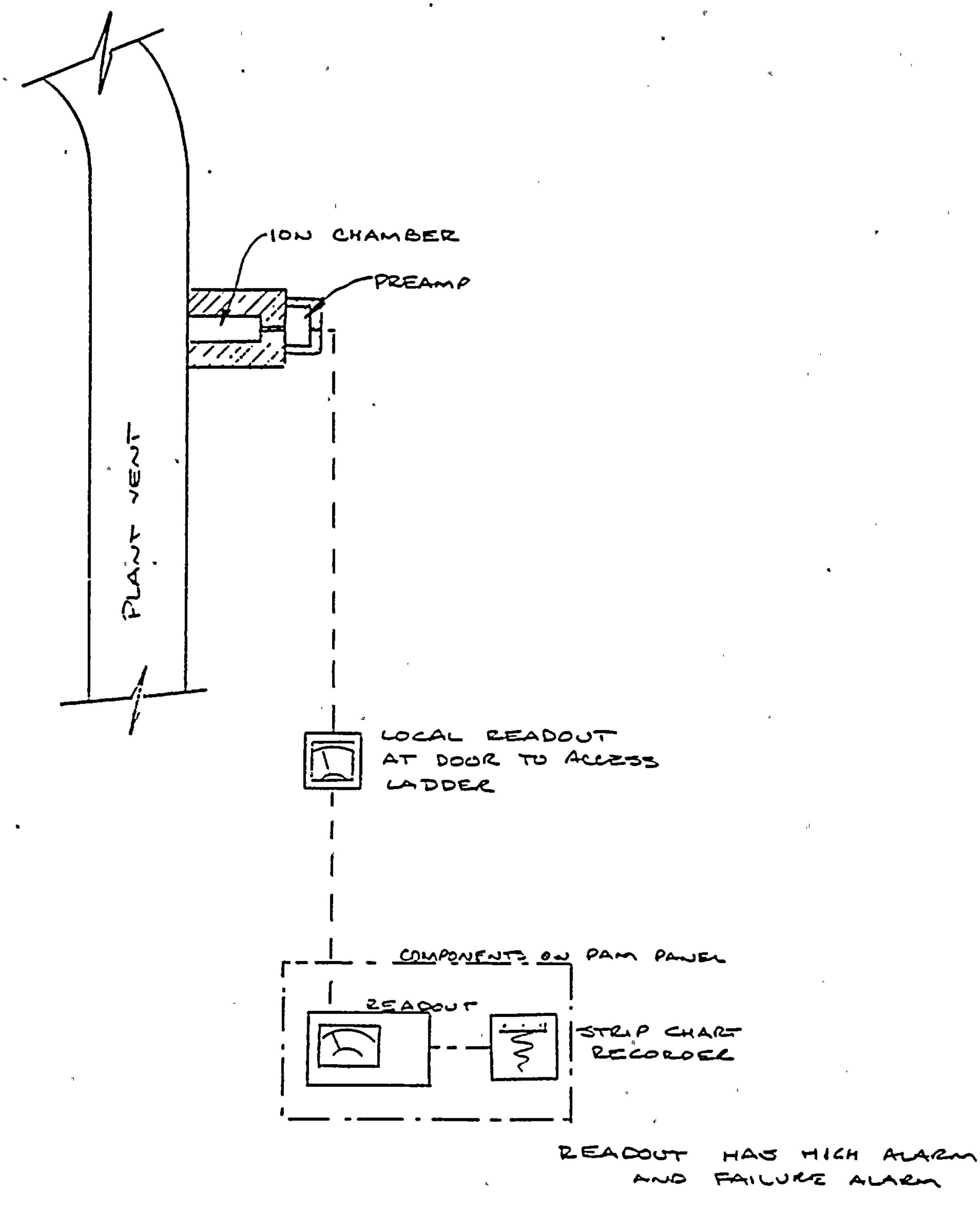


Figure 2.1.8.b-3

PLANT VENT HIGH RANGE
GROSS GAMMA MONITOR

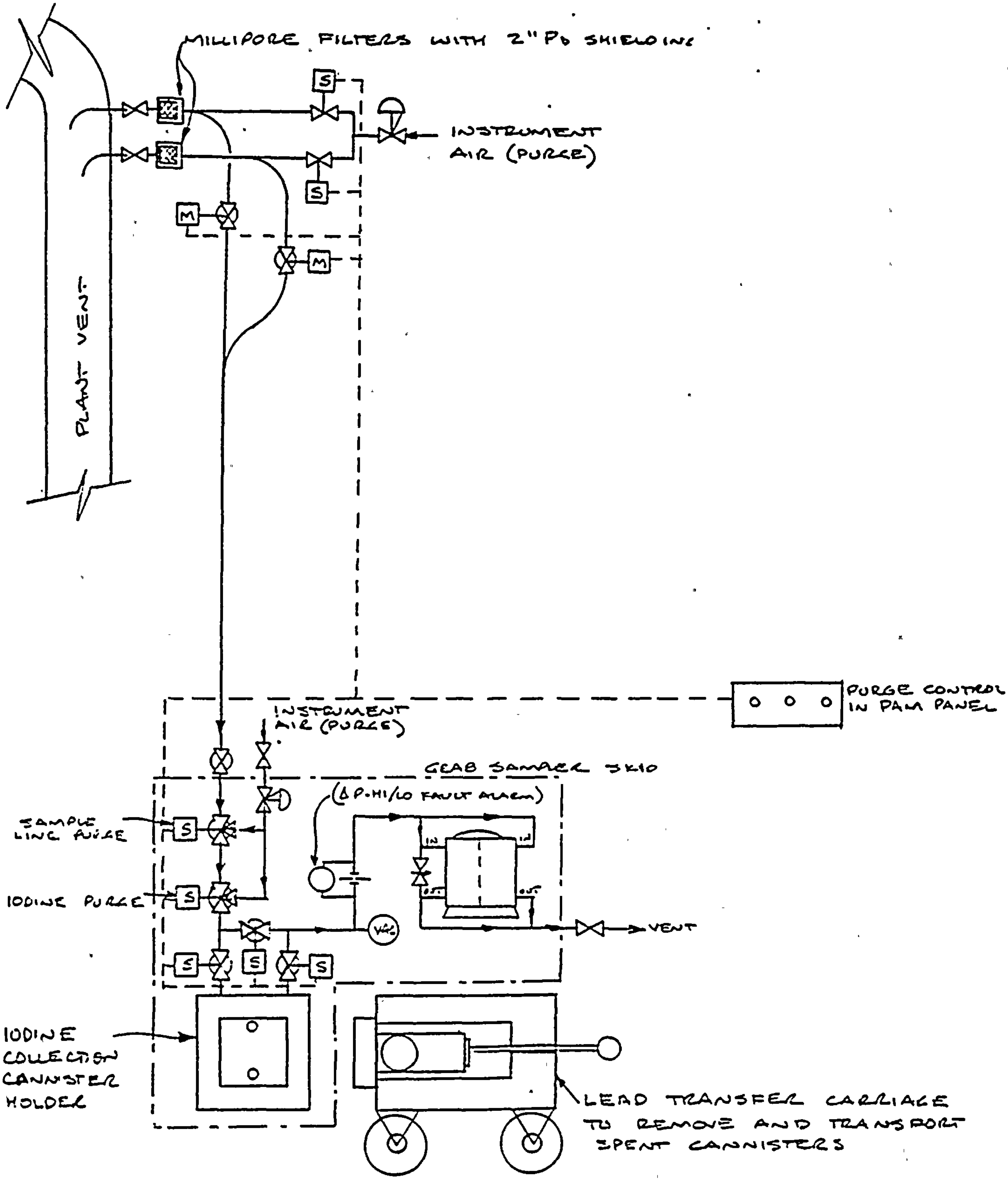


Figure 2.1.8.b-4

IODINE GRAB SAMPLER

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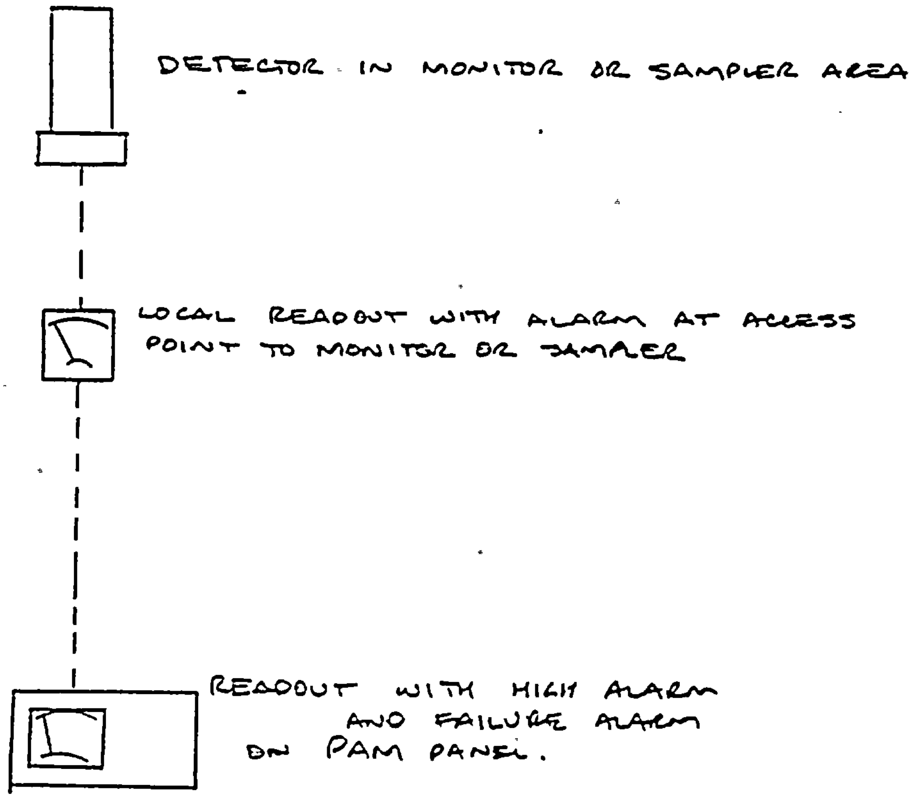

ONE ALARA MONITOR IS USED FOR THE PLANT VENT MONITOR AREA, AND ONE IS USED FOR THE SAMPLER AREA.

THE LOCAL READOUT FOR THE PLANT VENT GROSS GAMMA MONITOR SERVES AS ALARA MONITOR FOR THAT ACCESS.

Figure 2.1.8.b-5

ALARA MONITORS FOR POST-ACCIDENT MONITOR ACCESS

Section 2.1.8.c (Continued)

b. By January 1, 1981: The licensee shall have the capability to remove the sampling cartridge to a low background, low contamination area for further analysis. This area should be ventilated with clean air containing no airborne radionuclides which may contribute to inaccuracies in analyzing the sample. Here, the sample should first be purged of any entrapped noble gases using nitrogen gas or clean air free of noble gases. The licensee shall have the capability to measure accurately the iodine concentrations present on these samples and effluent charcoal samples under accident conditions.

PG&E Response and Status

PG&E will meet the requirements of the Task Force Position and clarifications by locating an additional multichannel analyzer in a low background, low contamination area near the Technical Support Center. PG&E has 500 silver zeolite cartridges in stock for use with the analyzer to provide accurate iodine sampling. This addition to the system will also give plant personnel the capability to accomplish the iodine analysis in the event that the normal chemistry lab becomes contaminated. This additional capability will be provided by May 1, 1980. In addition, PG&E will provide, if necessary, the installation of additional area monitors with remote read out to be in compliance with forthcoming requirements.

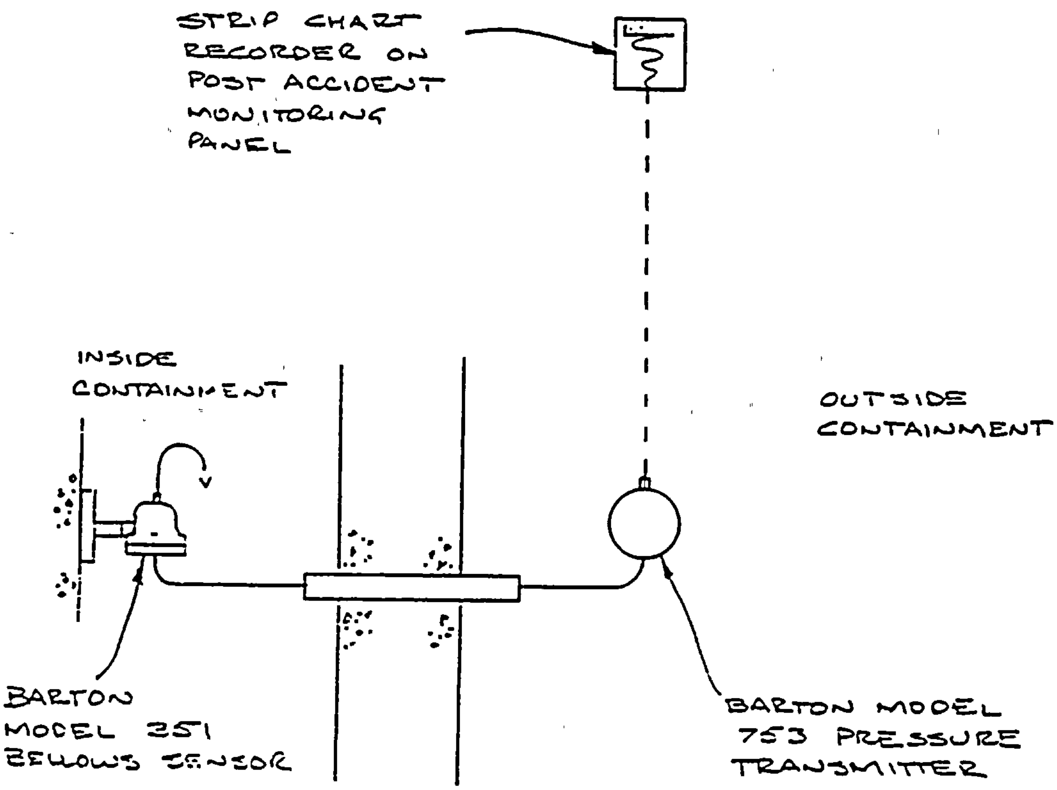

Figure ACRS.1-1

CONTAINMENT HIGH RANGE
PRESSURE INDICIATION (1 SHOWN, TYPICAL OF 2)

wide-range indicator as required would cover from 60' 4" to something less than 96' 1". Wide-range monitors with a 37' 8" span from the sump bottom to the top of the existing narrow-range monitors will be added as will recorders in the control room. The equipment will comply with Regulatory Guide 1.97.

Figure ACRS.2-1 describes the containment water level indication system. Mutually redundant loops are provided which are wired and separated in accordance with IEEE Class IE requirements. Each loop utilizes a Barton Model 764 differential pressure transmitter which, although qualified for submergence, is mounted above maximum flood level. A sealed capillary sensing leg connects each transmitter to a Barton Model 351 bellows sensor mounted in the reactor cavity sump - the lowest point in containment (wide range) or the containment recirculate sump (narrow range). The other leg of each transmitter is vented.

The wide range recorders are mounted on the Post Accident Monitoring Panel, and the narrow range indicators are mounted on the Main Control Board. The narrow range indicators are used when operating pumps for recirculation and are located above the respective recirculation control switches.

The existing sump level instrumentation meets the requirements for narrow range, except that the level range is from the bottom of the recirculation sump to the highest level used for the recirculation mode. Since the operator is using this instrumentation for recirculation control, it is not advisable to reduce the range. A wide range sump level instrument will be purchased by May 1, 1980. The instrumentation will be installed by January 1, 1981.

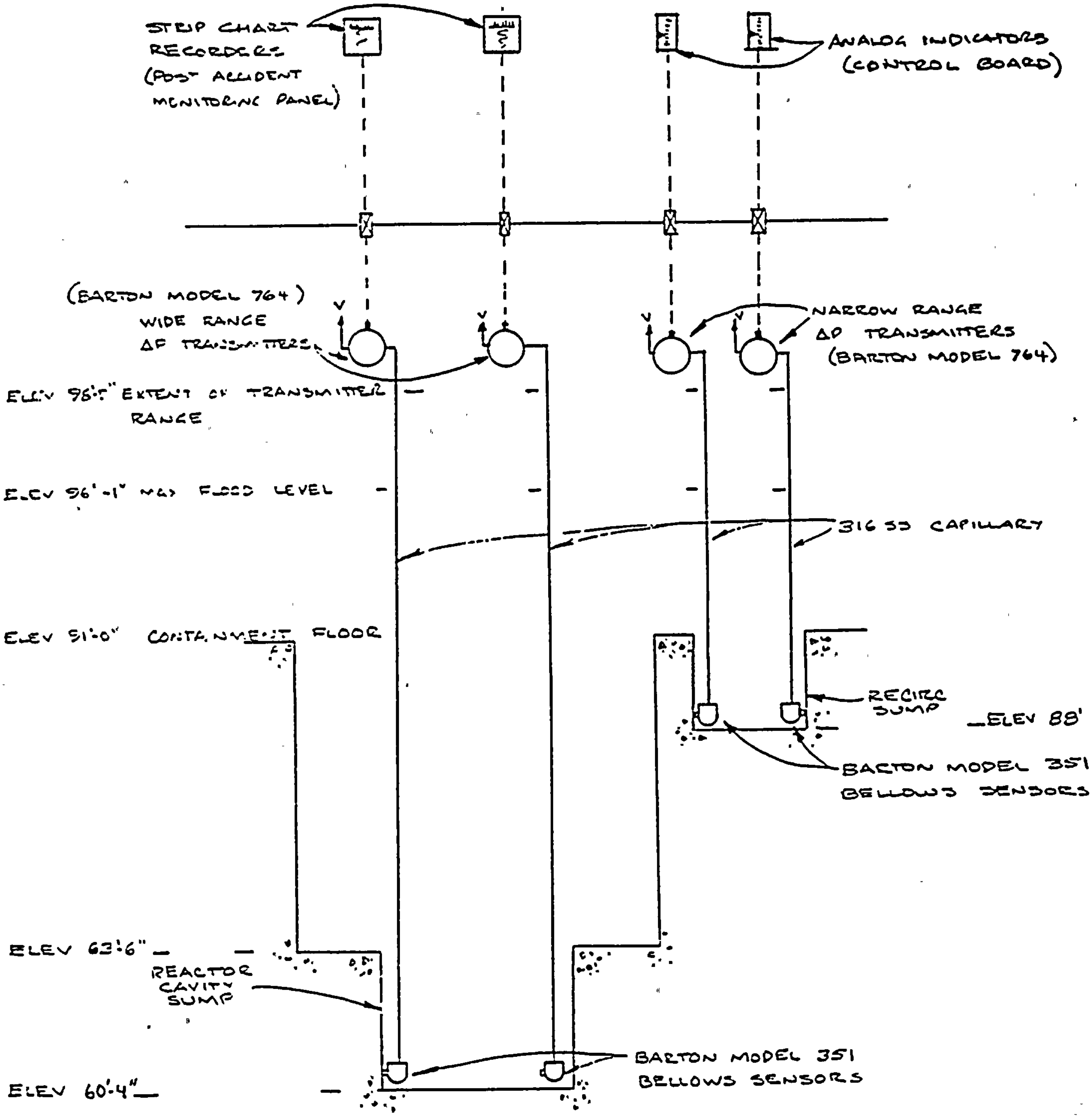

Figure ACRS.2-1

CONTAINMENT WATER LEVEL INDICATION
(DIAGRAMMATIC PRESENTATION - NOT AN ACTUAL LAYOUT)