PSNH PUBLIC SERVICE
Company of New Hampshire

SEABROOK STATION
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November 29, 1982

SBN-390
T.F. B7.1.2

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) USNRC Memorandum, dated October 14, 1982, "Notice of Meeting Regarding Open Items in the Safety Review," L. L. Wheeler to J. D. Kerrigan
(c) USNRC Memorandum, dated September 17, 1982, "Radiological Assessment Branch Site Tour of Seabrook Station," L. L. Wheeler to J. D. Kerrigan

Subject: Response to Open Items (SRP 11.5.2, 12.3.2, 12.3.4; Effluent Treatment Systems Branch, Radiological Assessment Branch)

Dear Sir:

The following open items were discussed at the referenced meetings. A summary of each Open Item and our response is provided below:

1. Open Item (SRP 11.5.2; Effluent Treatment Systems Branch)

Summary: The Process and Effluent Monitoring and Sampling System provision for radioiodines and particulates during the course of a postulated accident has not been addressed.

Response: In accordance with NUREG-0737 (Table II.F.1-2), provisions for obtaining samples of radioiodines and particulates from plant gaseous effluents, during the course of a postulated accident, have been included in the design of the Process and Effluent Monitoring and Sampling System.

A detailed discussion will be incorporated in OL Application Amendment 48 in FSAR Section 12.3.4 entitled "Plant Vent Monitor" as follows:

B001

Provisions for obtaining samples of radioiodines and particulates during the course of a postulated accident are included in the Seabrook design as part of the plant vent monitor. These sampling provisions are located downstream of the isokinetic nozzles. The air flow enters the sample conditioning skid of monitor RM-6528 at a flow rate of $\approx$ 0.06 cfm during

postulated accident conditions. This skid is intended to provide representative particulate and radioiodine samples for laboratory analysis (for normal operation as well as accident conditions) and to prevent contamination of the gas monitors. A multiple filter arrangement is provided so as to allow sampling capabilities for the duration of the measurement period. Each filter is equipped with a 4" solid lead shielding and quick disconnect fittings to minimize personnel exposures. In addition, all functional control is done remotely.

2. Open Item (SRP 11.5.2; Radiological Assessment Branch)

Summary: The applicant has not included noble gas monitors for the steam generator atmospheric relief valves or the safety valves as required by NUREG-0737.

Response: FSAR Table 11.5-1 (Sheet 1 of 2) has been revised (see Attachment A) to include the Range and Reference Isotope of the Main Steam Line Monitors. The revised version of FSAR Table 11.5-1 will be included in OL Application Amendment 48.

3. Open Item (SRP 12.3.2; Radiological Assessment Branch)

Summary: Submit information pertaining to Item II.B.2 of NUREG-0737, "Design Review of Plant Shielding and Environmental Qualification of Equipment for Spaces/Systems Which May be Used in Post-Accident Operations."

Response: The Radiological Assessment Branch Review (Mr. Sy Block) has been provided a copy of the Seabrook Post-Accident Shielding Analysis for his review.

4. Open Item (SRP 12.3.2; Radiological Assessment Branch)

Summary: Submit information pertaining to Item II.F.1.3 of NUREG-0737, "Containment High-Range Radiation Monitor."

Response: FSAR Section 12.3.4.1.b.3 (FSAR Page 12.3-16) has been revised (see Attachment A) to include the commitment to "design, locate, calibrate, and qualify" the containment high-range radiation monitors in "accordance with Table II.F.1-3 of NUREG-0737."

5. Open Item (SRP 12.3.2; Radiological Assessment Branch)

Summary: Submit information pertaining to Item III.D.3.3 of NUREG-0737, "Improved Inplant Iodine Instrumentation Under Accident Conditions."

Response: A new FSAR Section 12.3.4.3 entitled "Post-Accident Inplant Iodine Assessment," will be included OL Application Amendment 48 (see Attachment A).

FSAR Section 12.5.2.1 has been revised (see Attachment A) to address gamma detection equipment which is available in the Health Physics Counting Room and Radio-Chemistry Laboratory to detect the presence of iodine in air samples. The revised version of FSAR Section 12.5.2.1 will be included in OL Application Amendment 48.

6. Open Item (SRP 12.3.4; Radiological Assessment Branch)

Summary: Airborne radioactivity monitoring ventilation monitors are installed downstream of filters so they can not monitor for inplant airborne radioactivity.

Response: FSAR Section 12.3.4.2.b.2.(c) (FSAR Page 12.3-20) has been revised (see Attachment A) to include monitoring of Primary Auxiliary Building exhaust air upstream of filters.

FSAR Section 12.3.4.2.b.5 (FSAR Page 12.3-23) has been revised (see Attachment A) to include an increase in the number of Portable Continuous Air Monitors and their normal locations.

The above FSAR revisions will be included in OL Application Amendment 48.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

David O. Maidrand

J. DeVincentis for
Project Manager

ALL/fsf

cc: Atomic Safety and Licensing Board Service List

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TABLE 11.5-1
(Sheet 1 of 2)

PROCESS AND EFFLUENT RADIATION MONITORS

INSTRUMENT TAG NO. RE-	DESCRIPTION	DETECTOR TYPE	BACK-GRD. < mr/hr	RANGE LOW-HIGH (μCi/cc)	(Note 5) ALARM SET POINT (μCi/cc)	REFERENCE ISOTOPE	DETECTOR QTY. PER UNIT	SAFETY CLASS	ENERGY* LEVEL	LOOP DIAG. 9763-M	P&ID 9763-F
6502	Waste Gas Inlet to Carbon Delay Beds	Gamma Scint	15.0	10^{-2} 10^{+2}	(To be established during initial operation of plant)	Xe^{133}	1-Unit 1 only	Non 1E	Note 1	506897	805611
6503	Waste Gas Compresser Inlet	Gamma Scint	15.0	10^{-3} 10^{+1}		Kr^{85}	1-Unit 1 only	"	Note 1	506898	805612
6504	H_2 Gas Compressor Disch.	Gamma Scint	15.0	10^{-3} 10^{+1}		Kr^{85}	1-Unit 1 only	"	Note 1	506899	805612
6505	Condenser Air Evac	Beta Scint	0.5	Note 3		Xe^{133}	1 per Unit	"	Note 1	506055	202093
6500	Boron Recovery Stor. Tank Inlet	Gamma Scint	1.0	10^{-5} 10^{-1}		Co^{58},I^{131},Cs^{137}	1-Unit 1 only	"	Note 2	506105	805614
6501	Boron Recovery Test Tank Inlet	Gamma Scint	2.5	10^{-6} 10^{-3}		Co^{58},I^{131},Cs^{137}	1-Unit 1 only	"	Note 2	506113	805624
6515,6516	Primary Component Cooling Water	Gamma Scint	2.5	10^{-7} 10^{-3}		Co^{58},I^{131},Cs^{137}	2 per Unit	"	Note 2	506190	805016
6509	Liquid Waste Test Tk Disch to CWS	Gamma Scint	2.5	10^{-6} 10^{-2}		Co^{58},I^{131},Cs^{137}	1-Unit 1 only	"	Note 2	506927	805621
6514	Waste Liquid From Evaporators	Gamma Scint	2.5	10^{-6} 10^{-2}		Co^{58},I^{131},Cs^{137}	1-Unit 1 only	"	Note 2	506931	805621
6510,6511 6512,6513	Steam Gen Blowdown Sample Loops 1,2,3,4	Gamma Scint	2.5	10^{-6} 10^{-2}		Co^{58},I^{131},Cs^{137}	4 per Unit	"	Note 2	506815	805025
6519	Steam Gen Blowdown Flash Tank Drain	Gamma Scint	2.5	10^{-7} 10^{-3}		Co^{58},I^{131},Cs^{137}	1 per Unit	"	Note 2	506734	805024
6520-1,2	Reactor Coolant Gross Activity Monitor	Gamma Scint	2.5	10^{-4} 10^{+3}		Co^{58},I^{131},Cs^{137}	2 per Unit	"	Note 2	506297	805011
6481-1, 6482-1 6481-2, 6482-2	Main Steam Line Monitor	GM	2.5	~~(later)~~ 10^{-1} – 10^{+4} mR/hr		~~(later)~~ Xe-133	4 per Unit	"	-	506551 -2, -3, -4	202074
6560	RS TK-79A & B Filter	GM	>100	Note 4			1-Unit 1 only	Non 1E		506	805613
6561	Screen Monitor	GM	15	Note 4			1-Unit 1 only	Non 1E		506694	805613
6564	Screen Monitor	GB	15	Note 4			1-Unit 1 only	Non 1E		586692	805613

* See Table 11.5-1 (Sheet 2) for notes.

A typical channel is shown in Figure 12.3-18.

High radiation during refueling at the manipulator crane area in the containment structure initiates isolation of the containment purge and vent system.

Detectors designated as non-Class 1E located inside the containment structure are not designed to operate following a major LOCA, and are assumed to be not available to monitor post-LOCA conditions inside containment.

Refer to Section 11.5.2 for a discussion of the local microprocessor provisions and operating details.

1. Area Monitor Detectors

   The area monitors employ Geiger-Mueller and ion chamber gamma detectors, as indicated on Table 12.3-13.

2. Class 1E Requirements

   Separate redundant cabinets are provided in the control room for control, recording and remote indication for the monitors in Table 12.3-13 designated as Class 1E. These cabinets and Class 1E area monitors are powered from their respective Class 1E inverters. Class 1E monitors supply their data to the RDMS host computer through an IEEE-279 acceptable isolation device. No information or alarm setting is permitted between the RDMS host computer and the Class 1E equipment. All set-point changes and check-source insertions are performed locally or from hard-wired modules in the control room.

3. In-Containment High Range Monitoring

   Class 1E redundant detectors are located inside containment ~~near the top of the dome~~ to monitor conditions during post-LOCA conditions. The detector range is 10^0-10^7 R/hr. The electronics cabinet is located outside containment in the electrical tunnels. Indication and alarm is provided in the control room.* insert

4. Containment Manipulator Crane Area Monitor-Channels 6535 A and B

   Class 1E redundant detectors are located on the manipulator crane. In the event of a fuel handling accident, these monitors isolate the containment on-line and off-line purge isolation valves. Indication and alarm is provided locally and in the main control room.

* These monitors will be designed, located, calibrated and qualified in accordance with Table II. F. 1-3 of NUREG-0737.

Indication and alarm is available locally near the cleanup filter, and remotely in the main control room.

(e) Containment Enclosure Monitor - Channel 6568

This detector is located in the exhaust duct from the containment enclosure at the inlet to the cleanup filter. The detector monitors the gross activity exhausted from the containment enclosure. Indication and alarm is available locally near the cleanup filter, and remotely in the control room.

(f) Control Room Air Intake Monitors - Channels 6506A and B, 6507A and B

Four detectors are located in the east air intake structure and four detectors are located in the west air intake structure. Two detectors at each intake structure are dedicated to each unit. These detectors, which are Class 1E, monitor the control room air intake and automatically shut down, on a high radiation signal, their respective control room ventilation fans and isolation dampers.

Indication and alarm is provided locally. Indication, recording and alarm is provided in the main control room.

5. Portable Continuous Air Monitors (CAM)

Four portable continuous air monitors are available. These devices are composed of a beta scintillation detector which monitors a fixed particulate filter. Downstream of the filter is a charcoal cartridge which can be removed for laboratory analysis. The device also includes a pumping system, flow rate measuring device, a microprocessor and an interface connection with the RDMS host computer. The range of the CAM's is 10^{-10} and 10^{-6} microcuries per cubic centimeter.

see next page

6. Calibration and Maintenance

Refer to Subsection 11.5.2.6 for calibration and maintenance details.

12.3.4.3 Post Accident Inplant Iodine Assessment

The capability exists for the determination of airborne radioiodine levels inplant under accident conditions. This capability includes the use of air samplers with radioiodine specific sample cartridges and the use of high resolution gamma spectroscopy instrumentation for sample analysis. Information on portable air sampling and counting room equipment is discussed in Sub section 12.5.2. This sampling and analysis is described in station procedures

to which station personnel are trained.

5. Portable Continuous Air Monitors (CAM)

Eight portable continuous air monitors are available. The CAMs are equipped to monitor particulate, ~~iodine~~, and noble gas. Iodine cartridges are removed from the CAMs for laboratory analysis (as described in 12.5.2.1). and sample for iodine.

The normal locations for the CAMs are as follows:

- o 1 per Control Room
- o 1 per Primary Auxiliary Building
- o 1 per Fuel Storage Building
- o 1 per Containment (on the operating floor during refueling outages)

CAMs may be moved to other station locations as radiological conditions dictate.

12.5.2.1 Counting Room Equipment

The instrumentation in the Counting Rooms is used for determining airborne radionuclide concentrations, removable contamination, and radionuclide concentrations in liquid samples.

There are two Counting Rooms that house the fixed radiation detection equipment. The Health Physics Control Station has a Counting Room that is equipped with alpha, beta and gamma detection equipment to analyze routine air samples and contamination survey smears. The Health Physics Counting Room is supplemented by a Counting Room located in the Radio-Chemistry Laboratory when additional analysis capabilities are required. The gamma detection equipment includes two high purity intrinsic germanium detectors equipped with multichannel analyzers. This gamma detection equipment is available in the Health Physics Counting Room and Radio-Chemistry Laboratory. NUREG-0737, Item III.D.3.3 requires the capability to remove air samples (for iodine) to a low background area for analysis. This gamma detection equipment (described above), which is available in two locations, satisfies this requirement.

The equipment located in the Radio-Chemistry Laboratory Counting Room will be capable of detecting, as a minimum, alpha, beta, and gamma activity (as specified above). This Counting Room equipment is used primarily for quantitative and qualitative analysis of liquid.

Criteria for equipment selections are numerous and include accuracy, stability under various atmospheric conditions, sensitivity, and compatibility with many types of peripherals. One detector system is equipped with automatic sample changing and printout devices in order to maximize speed and ease of operation for large numbers of samples which could be expected during various phases of station operation.

Indication and alarm is available locally and in the main control room for both units.

See Subsections 5.2.5.3.b.2, 5.2.5.5.b and 5.2.5.5.c for a further discussion of monitoring requirements.

(b) Waste Process Building Monitor - Channel 6531

The major potential release of airborne radioactivity in the waste processing building is that associated with the gaseous waste processing system. The gas dryers, carbon delay beds and the two gas compressors are situated in their individual compartments, and these compartments are ventilated in such a way that they are at a negative pressure with respect to surrounding areas. The ducted ventilation exhaust is continuously sampled and monitored. The sample is returned to the ducted ventilation exhaust line which is directed to the Unit 1 vent. Both the sampling point and the return are downstream of the filters in the ventilation exhaust line outside the building. Information from this channel is displayed and alarmed on the radiation monitoring system panel in the main control room of Unit 1 and locally.

(c) Primary Auxiliary Building Monitor - Channel 6532

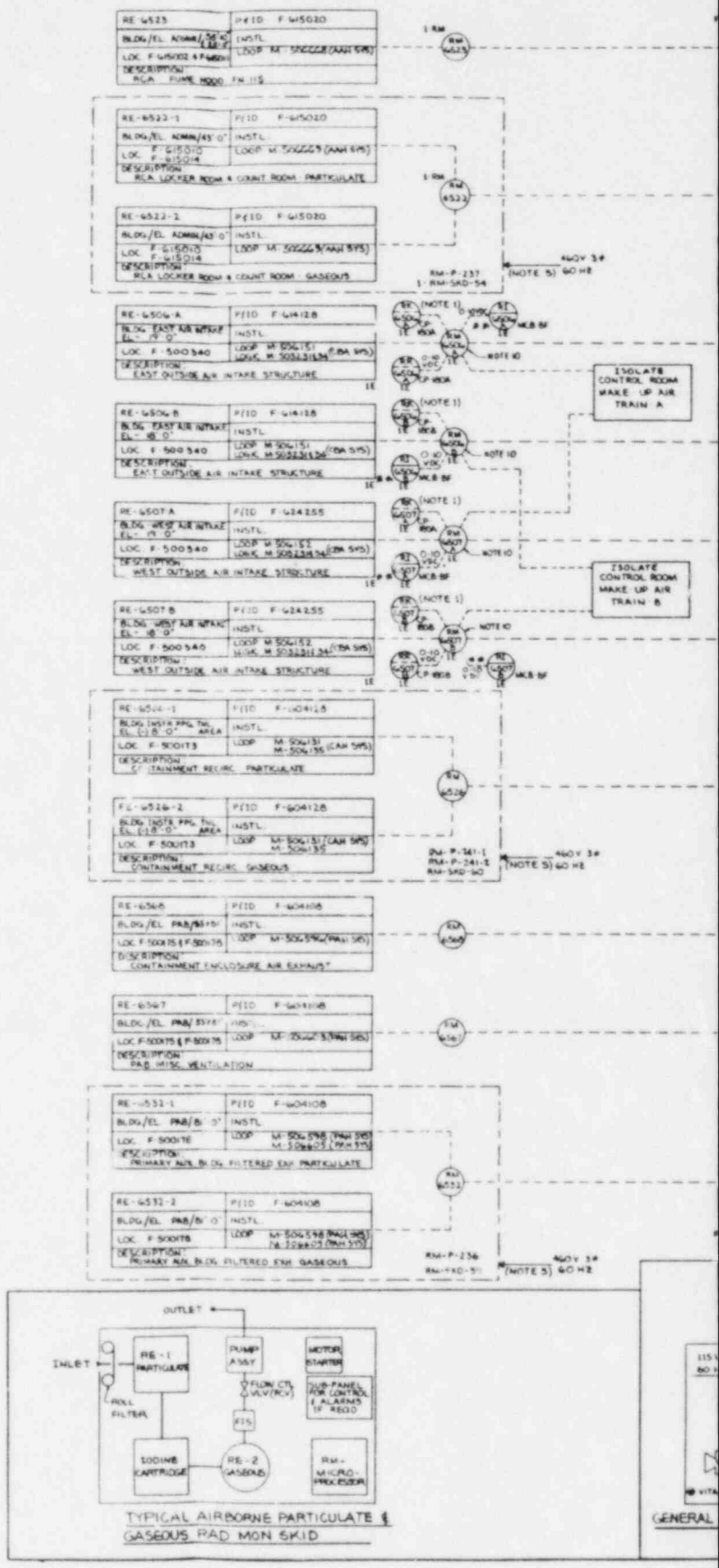
Three minimum ventilation areas have been defined for the primary auxiliary building:

(1) Heat exchanger, thermal regeneration demineralizer, and mixed bed demineralizer area,

(2) Volume control tank area, and

(3) Charging pump area.

These areas, which are potential sources of airborne activity, are maintained at a negative pressure with respect to surrounding areas, and have their own ventilation exhaust ducting, filters, and fans which direct the exhaust air to the plant vent. A continuous air sample is removed from ~~the ducting downstream of the~~ each of the two ducts on the inlet to the PAB ventilation filters. The air is ~~filters and~~ monitored for particulate and gaseous activity. ~~The sample is~~ and returned to the ventilation exhaust line, ~~again, downstream~~ upstream of the filters. Indication and alarm is available locally and in the main control room for both units.
An alarm indication on these monitors would trigger a radiological evaluation within the areas served by these monitored ventilation lines. The evaluation would be performed by station HP personnel using portable survey and/or air sampling equipment, as necessary, to locate the source of the elevated ventilation line indication.


RE-6523
P&ID F-615020
INSTL
DESCRIPTION
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RE-6522-1
P&ID F-615020
INSTL
DESCRIPTION
RCA LOCKER ROOM & COUNT ROOM PARTICULATE
RE-6522-2
P&ID F-615020
INSTL
DESCRIPTION
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RM-SKD-54
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(NOTE 5) 60 HZ
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P&ID F-614128
INSTL
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P&ID F-614128
INSTL
DESCRIPTION
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P&ID F-624255
INSTL
DESCRIPTION
WEST OUTSIDE AIR INTAKE STRUCTURE
RE-6507-B
P&ID F-624255
INSTL
DESCRIPTION
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ISOLATE CONTROL ROOM MAKE UP AIR TRAIN B
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RE-6526-2
P&ID F-604128
INSTL
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CONTAINMENT RECIRC GASEOUS
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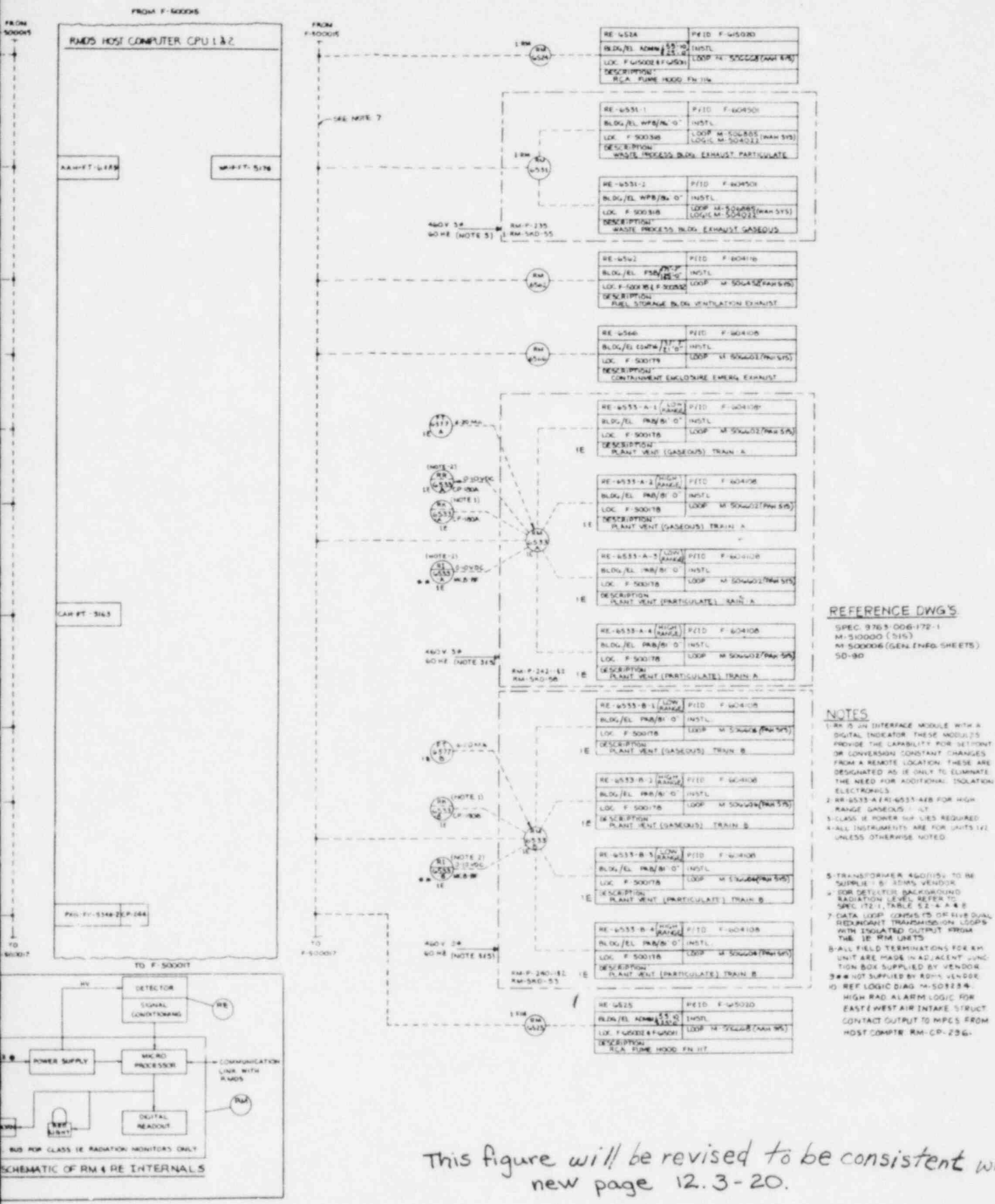
RM-P-241-2
RM-SKD-60
460V 3Φ
(NOTE 5) 60 HZ
RE-6568
P&ID F-604108
INSTL
DESCRIPTION
CONTAINMENT ENCLOSURE AIR EXHAUST
RE-6567
P&ID F-604108
INSTL
DESCRIPTION
PAB MISC. VENTILATION
RE-6532-1
P&ID F-604108
INSTL
DESCRIPTION
PRIMARY AUX. BLDG. FILTERED EXH. PARTICULATE
RE-6532-2
P&ID F-604108
INSTL
DESCRIPTION
PRIMARY AUX. BLDG. FILTERED EXH. GASEOUS
RM-P-236
RM-SKD-59
460V 3Φ
(NOTE 5) 60 HZ
OUTLET
INLET
ROLL FILTER
RE-1 PARTICULATE
PUMP ASSY
MOTOR STARTER
FLOW CTL & VLV (NOV)
SUB-PANEL FOR CONTROL & ALARMS IF REQD
FTS
IODINE CARTRIDGE
RE-2 GASEOUS
RM-MICRO-PROCESSOR
TYPICAL AIRBORNE PARTICULATE & GASEOUS RAD MON SKID
GENERAL



This figure will be revised to be consistent with new page 12.3-20.

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION - UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT	AIRBORNE RADIATION MONITORING SYSTEM INSTRUMENTATION ENGINEERING DIAGRAM	
	9763-F-500016	FIGURE 12.3-19