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Robert L. Mittl General Manager
Nuclear Assurance and Regulation

June 18, 1985

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Attention: Mr. Walter Butler, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

AIRBORNE IODINE CONCENTRATION INSTRUMENTS -
SER CONFIRMATORY ISSUE 35
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

In response to Hope Creek Generating Station Safety Evaluation Report (SER) Confirmatory Issue 35, Public Service Electric and Gas Company (PSE&G) hereby provides for NRC staff review the attached description of equipment, training, and procedures for accurately determining the airborne iodine concentration in areas within the Hope Creek plant where personnel may be present during an accident.

The required description is provided as Attachment 1 to this letter. PSE&G will also revise the Hope Creek FSAR in the next scheduled amendment, as shown in Attachment 2, to incorporate this information. Unless notified otherwise, PSE&G now considers this issue to be closed.

Should you have any questions or concerns regarding this matter, please contact us.

Very truly yours,

C D. H. Wagner
USNRC Licensing Project Manager

A. R. Blough
USNRC Senior Resident Inspector

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ATTACHMENT 1

RESPONSE TO SER
CONFIRMATORY ISSUE 35

ATTACHMENT 1

RESPONSE TO CONFIRMATORY ISSUE 35

SAMPLE EQUIPMENT AND MEDIA

Inplant sampling for radioiodine shall be performed using two types of portable instruments - a standard low volume air sampler with a silver zeolite cartridge as the sample media, and an Emergency Air Sampler Assembly, comprised of an evacuated (29-30" Hg) 9.5 liter Marinelli Beaker with a silver zeolite cartridge as the sample media (see Figure 1). In addition to the AC-powered low volume air samplers used for normal on-site air sampling, two DC-powered air samplers will be provided in each of the Emergency Lockers located in the 137'el Control Point, TSC, Control Room, Emergency Van, and one in each off-site survey team kit. One Emergency Air Sample Assembly will also be stored in each of the Emergency Lockers located in the 137'el Control Point, TSC, and Control Room.

SAMPLE ANALYSIS EQUIPMENT AND LOCATION

Analyses of inplant and onsite silver zeolite cartridges for radioiodine will normally be performed using high purity germanium detectors (HPGe). These detectors will be located in the Chemistry Laboratory (124'el) and the Radiation Protection Count Room (137'el). Analyses of offsite silver zeolite cartridges will be performed using Eberline Model SAM-2 portable dual channel analyzer with a probe capable of detecting 365 kev iodine-131. The SAM-2 will also be used to analyze silver zeolite cartridges for in-plant or on-site samples should the background radiation levels in the Chemistry Laboratory or Radiation Protection Count Room be too high to perform analyses with the HPGe.

SAMPLE FLUSHING METHOD

Prior to analysis, all silver zeolite cartridges analyzed in-plant will be purged using bottled nitrogen gas or clean air (i.e., free of noble gases) to ensure absence of noble gases (i.e. xenon). Purging the cartridges will be performed in a well ventilated area or under a laboratory hood.

Emergency grab Air Sampling shall be performed in accordance with Emergency Procedure EP-IV-112 using air samples and Emergency Air Sample Assemblies. EP-IV-112 describes the methodology for evacuating the Marinelli Beaker and obtaining the sample. It also describes the methodology to obtain a sample utilizing a low volume air sampler and sample transport.

Radioiodine and Noble Gas Activity Sample Analysis shall be performed in accordance with Emergency Procedure EP IV-113 and HCGS Radiation Protection Procedure RP-SA.ZZ-003(Q) Airborne Radioactivity Analysis. EP-IV-113 describes the methodology to analyze emergency grab air samples (air sampler and Emergency Air Sample Assembles). It also provides instruction on how to determine iodine concentrations (using the HPGe, SAM-2, or rule of thumb). RP-SA.ZZ-003 provides additional step-by-step instruction on analysis of samples using the HPGe.

TRAINING

Training of personnel who will obtain and analyze inplant radioiodine samples will be accomplished in two ways:

1. Radiation Protection Technician/Technical Assistant (TN/TA) Training.

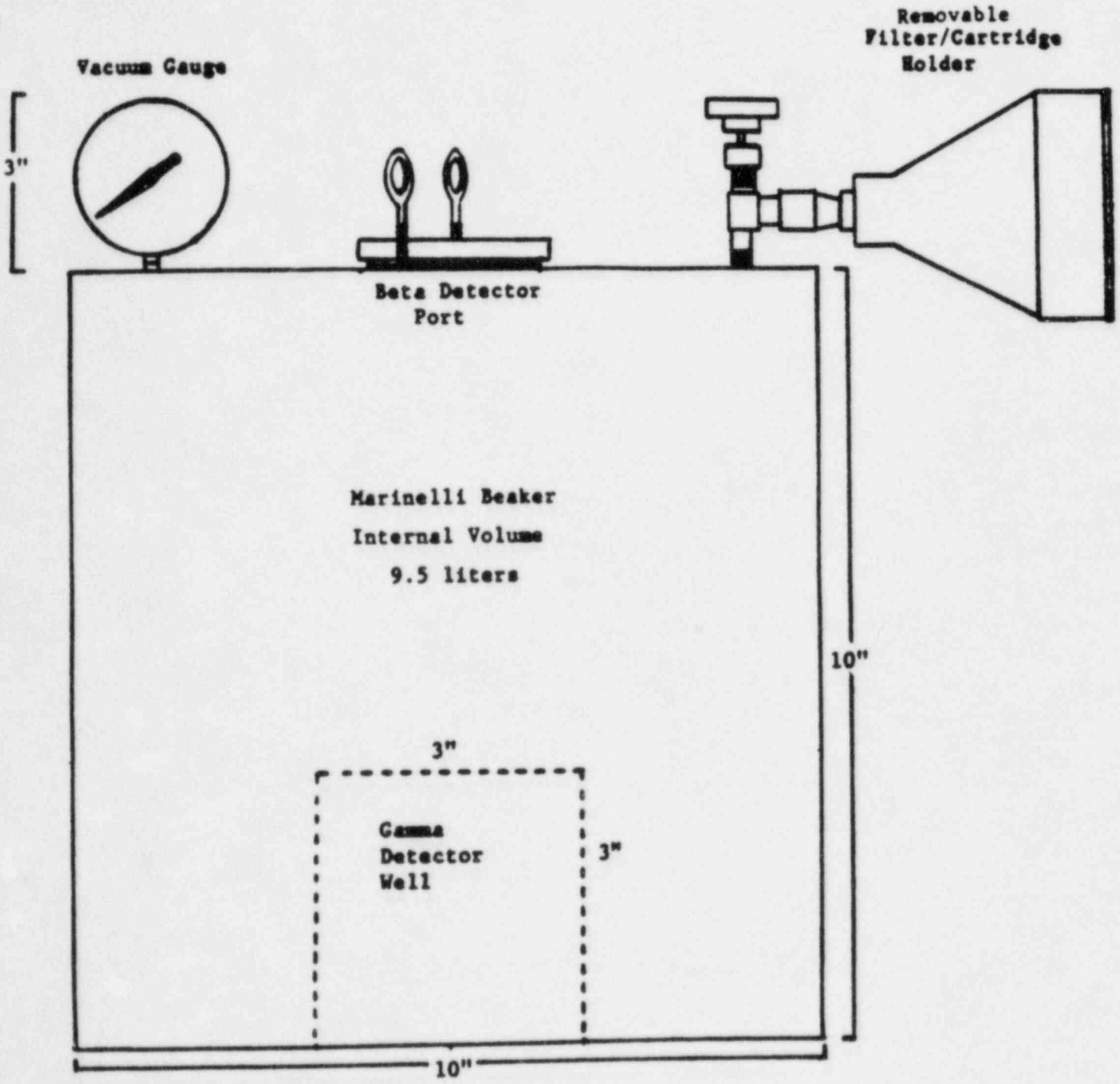
2. Emergency Plan Training.

Both Radiation Protection TN/TA Training and Emergency Plan Training are comprised of classroom instruction and practical factors demonstrations.

Radiation Protection TN/TA Training provides instruction for sampling and analysis of samples during normal conditions. In addition, Emergency Plan Training provides additional instruction on the use of the apparatus used to draw and analyze the sample IAW Emergency Plan procedures.

FIGURE 1

EMERGENCY AIR SAMPLE ASSEMBLY



PHYSICAL DESCRIPTION OF EMERGENCY AIR SAMPLE ASSEMBLY

The Emergency Air Sample Assembly is a 9.5 liter Marinelli Beaker fitted with a vacuum gauge and a small penetration where a vacuum tube or an air sample filter/cartridge holder may be attached. This penetration is located on the top of the container and may be sealed by closing the attached Whitey Vacuum Valve. This cylindrical aluminum container is 10 inches tall, has a 10 inch diameter, and weighs 11 pounds. The valve and vacuum gauge stand less than 3 inches above the container and need not be moved for a beta-gamma analysis of the contents. A nylon carrying strap is attached to eyelets on top of the sample assembly by a set of quick disconnect clips. A recessed well is provided in the bottom of the container where a Sodium Iodide, Germanium Lithium, or High Purity Germanium Detector may be placed for gamma counting. The capped 2" Diameter penetration in top center of the container may be fitted with a beta phospher detector and photomultiplier tube for a coincident beta count when desired.

ATTACHMENT 2

FSAR CHANGES RELATED TO
SER CONFIRMATORY ISSUE 35
RESPONSE

Background and efficiency checks are performed routinely. Counter plateaus are established to determine operating voltages. Calibrations for the isotopes are based on National Bureau of Standards (NBS) related guidelines. Conventional radionuclide reference standards will be used for calibrations.

12.5.2.2.3 Portable Survey Instruments and Equipment

Portable survey equipment is used primarily for conducting area surveys and for monitoring personnel throughout the plant. Some portable equipment is reserved for emergency use and is located in lockers at the access control point, the control room, the technical support center, and the offsite emergency operations facility.

The criteria for selection of the portable instruments include:

a. Ability of instrument to perform in its intended use with reliability and accuracy;

b. Ease of calibration and repair;

c. Interchangeability of components;

d. Weight and size for user acceptance;

e. Standard readouts and controls/adjustments to simplify training of users.

Portable instruments for routine plant use are provided to permit alpha, beta, gamma, and neutron radiation measurements, and for obtaining samples of surface and airborne contamination. The projected numbers and types of instruments are listed in Table 12.5-1.

Portable instruments for emergency use are provided to permit alpha, beta and gamma radiation measurements for obtaining samples of surface and airborne contamination.

12.5.2.2.4 Personnel Dosimetry

Personnel monitoring will be provided by the use of thermoluminescent dosimeters (TLDs), direct reading pocket dosimeters, or calculations from area survey data and exposure

before, during, and/or after various work activities. Area surveys are performed by radiation protection personnel.

12.5.3.1.1 Radiation Detection

The preferred instrument for beta-gamma dose rate measurements is an ion chamber. G-M probes are preferred for measurement of low radiation levels or where environmental conditions such as temperature or humidity could cause erratic responses from ion chambers.

The preferred neutron measurement instrument is a rem counter, or equivalent, that has the ability to measure neutron dose rate in rem per hour.

These radiation detection methods are supplemented by continuous area and process radiation monitoring equipment with alarm capabilities, as described in Sections 11.5 and 12.3.4.

12.5.3.1.2 Surface Contamination Detection

A variety of techniques are used to detect and measure radioactive contamination. Procedures prescribe the use of smears (small paper discs) and swipes (paper towels) to wipe a surface to pick up removable contamination. Fixed contamination is determined by scanning a surface with portable survey meters. G-M probes are used for beta-gamma measurements and alpha detectors are used to distinguish the alpha component.

12.5.3.1.3 Airborne Contamination

Airborne contamination is normally determined by using air samplers to draw a known volume of air through a filter paper or charcoal cartridge. A charcoal cartridge is used with filter paper where iodine is of concern. The filter paper and charcoal cartridge are is analyzed by gross beta-gamma count and/or gamma spectrometry. The gamma spectrometry identifies the particulate and radioiodine isotopic activity. Gross beta-gamma count data is used to judge the need for gamma spectrometry. High volume air samplers and low volume air samplers having nominal sample rates of 25 scfm and 2 scfm, respectively, are available. The high volume air sampler is used primarily to quickly obtain grab samples before, during, and after work activities. The low

volume air sampler is used primarily to obtain the average air concentration for the work period.

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12.5.3.1.4 Survey Frequency and Techniques

Each area found to have a radiation dose rate such that an individual could receive 5 mrem in any one hour, or 100 mrem in any five consecutive days, is conspicuously posted as a radiation area, in accordance with 10 CFR 20. Every reasonable effort is made to minimize inadvertent entries into such areas. Routine surveys of all radiation areas are taken to ensure that each area is surveyed on a regular basis. Areas subject to variations in radiation levels and occupancy times may be surveyed on a more frequent basis. When reactor conditions are operationally stable, survey frequency in radiation areas may be reduced to spot checks at boundaries to minimize radiation protection personnel exposures.

Each area found to have a radiation dose rate equal to or greater than 100 mrem/h is posted as a high radiation area and access is controlled in accordance with 10 CFR 20 and technical specifications. Routine surveys within such areas are not normally performed with conventional portable survey instruments. Every reasonable effort is made to use readings from the radiation monitoring system (RMS) area radiation monitors to identify changes of radiation levels. Measurement of maximum and general radiation levels within high radiation areas is normally performed with remote probe survey instruments, long reach survey instruments, retrievable TLDs, or dosimeters. When practicable, findings from these surveys are correlated to the appropriate RMS area radiation monitor readings and reactor operating conditions. Correlation readings and/or perimeter readings are taken to ensure that each high radiation area is surveyed on a regular basis. In addition, the frequency of radiation surveys taken at entrances to high radiation areas is dependent upon occupancy in the vicinity and variation in radiation levels. If surveys at entrances or RMS readings show significant change, additional surveys may be performed to update the surveys for the area. In order to minimize occupational exposure of surveyors, high radiation area survey frequency may be reduced when operating conditions are stable.

Areas in and around the RCA not considered potential radiation areas are selectively surveyed to establish that every reasonable effort has been made to keep measurable radiation at ALARA levels. Portable instrument surveys are performed to ensure that a representative number of non-radiation areas are surveyed once

INSERT 1

Inplant sampling for radioiodine during an emergency will be performed using two types of portable instruments - a standard low volume air sampler with a silver zeolite cartridge as the sample media, and an Emergency Air Sampler Assembly, comprised of an evacuated (29-30" Hg) 9.5 liter Marinelli Beaker with a silver zeolite cartridge as the sample media. In addition to the AC-powered low volume air samplers used for normal on-site air sampling, two DC-powered air samplers will be provided in each of the Emergency Lockers located in the 137'el Control Point, TSC, Control Room, Emergency Van, and one in each off-site survey team kit. One Emergency Air Sample Assembly will also be stored in each of the Emergency Lockers located in the 137'el Control Point, TSC, and Control Room.

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Individuals who have not received GE~~Y~~T training (T) (i.e., visitors) within the last year shall be escorted by GE~~Y~~T qualified individuals and shall receive pertinent site instructions with each entry.

Individuals who have not received RWT for unescorted access to the RCA shall be escorted by individuals who are currently so qualified and shall receive radiation protection training commensurate with the purpose for entry, prior to such entry, as determined by radiation protection supervision.

Any female employee working in the restricted area, her immediate supervisor, and those specifically identified as coworkers of the female employee, are given instruction concerning prenatal radiation exposure, as defined in Regulatory Guide 8.13 (Rev 1). Female visitors who enter the restricted area also receive these instructions commensurate with their purpose for entry.

12.5.3.6.2 Respiratory Equipment Training and Fit Test

Certain individuals may be required to wear specific respiratory equipment in lieu of filter respirators in the performance of their responsibilities. A separate training class, beyond the introduction provided in radiation protection training, will be conducted for them in the purpose, use, and limitations of specific respiratory protective equipment used at the site.

To be eligible for duty which requires the use of respiratory equipment and the application of protection factors, an individual must pass the respiratory fit test, must have received the respiratory equipment training, and must be medically certified as being capable of working safely while wearing respiratory equipment. A test environment of NaCl, corn oil aerosol or equivalent system will be used to quantitatively prove a satisfactory respirator fit for different types of respirators. Procedures will be established that describe the technique and define acceptance criteria.

12.5.3.6.3 Radiation Protection Personnel Training

A radiation protection training program for radiation protection workers, assistants, and technicians is provided as recommended by ANSI 3.1-1981. This program instructs new radiation protection workers in the operational and analytical radiation

protection procedures and familiarizes them with plant layout and systems. After successful completion of the program for assistants and technicians, individuals receive further comprehensive instruction for the specific requirements of their positions, including training on iodine monitoring for the Emergency Plan.

12.5.3.7 Radiation Protection Records

Radiation protection records, which are generated from procedural requirements of Sections 12.5.3.1 through 12.5.3.6, are maintained and retained to meet regulatory and technical specification requirements.

12.5.3.8 ALARA Program

Basic ALARA philosophies, policies and responsibilities are discussed in Section 12.1.

The operational ALARA program encompasses all elements of the radiation protection program. In addition to the station ALARA procedure (SA-AP.ZZ-30) many specific ALARA topics are covered in radiation protection department procedures such as the use of portable shielding, completion of ALARA reviews, and exposure reduction methods.

The station ALARA program as described in SA-AP.ZZ-30 outlines the responsibilities and documentation for:

a. Pre-job planning

b. Job performance evaluation

c. Post job review

d. Process review

e. ALARA review of procedures

f. Station ALARA committee

TABLE 12.5-1

TYPES OF PORTABLE INSTRUMENTS

Type	Instrument(1)	Radiation Detected	Range	Calibration Frequency	Intended Use	Approximate Inventory(3)
Ionization						
	RO-2	beta-gamma	0-5000 m/hr	6 months	Dose Rate Surveys	10
	RO-2A	beta-gamma	0-50 R/hr	6 months	Dose Rate Surveys	10
	PIC-6A	gamma	0-1000 R/hr	6 months	Dose Rate Surveys	8
	SRPD's	gamma	various	6 mos/3 mos(2)	Personnel Monitoring (exposure)	1700
	RO-7	gamma	0-19.99 KR/hr	6 months	Accident Surveys (R.G. 1.97)	2
Proportional						
	PNR-4	neutron	0-5000 mrem/hr	6 months	Dose Rate Surveys	3
	Scalers	alpha,beta,gamma	0-10^4 counts	6 months	Air Samp & Swipe Counting	2
G-M						
	Teletector	beta-gamma	0-1000 R/hr	6 months	High Range Dose Rate Surveys	16
	RM-14	beta-gamma	0-50,000 c/m	6 months	Personnel Monitoring (contamination)	20
	E-530N	gamma	0-20 R/hr	6 months	Dose Rate Surveys	10
	E-140	beta-gamma	0-50 mr/hr	6 months	Low Dose Rate Surveys	10
	AMS-3	beta-gamma		6 months	Continuous Air Monitoring	10
	Scalers	beta-gamma	0-10^4 counts	6 months	Air & Swipe Counting	4
Scintillation						
	PAC-4S	alpha	0-200,000 c/m	6 months	Alpha Surveys	4
	Scalers	alpha,beta, gamma	0-10^4 counts	6 months	Air & Swipe Counting	2

(1) or equivalent instrument

(2) Self-reading pocket dosimeters used for permanent exposure records shall be calibrated every 3 months.

(3) For routine and emergency use.