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AUTH.NAME AUTHOR AFFILIATION
SCHUYLER,J.O. Pacific Gas & Electric Co.
RECIP.NAME RECIPIENT AFFILIATION
KNIGHTON,G.W. Licensing Branch 3

SUBJECT: Informs that SENTRY post-accident sampling sys per TMI Item II.B.3,operable w/exception of training of technicians for in-line sampling & analysis.Completion of training scheduled by 840725.

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J. O. SCHUYLER
VICE PRESIDENT
NUCLEAR POWER GENERATION

July 24, 1984

PGandE Letter No.: DCL-84-271

Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-76
Diablo Canyon Unit 1
Operability of PASS

Dear Mr. Knighton:

The primary method for post accident sampling at Diablo Canyon Unit 1, the SENTRY Post Accident Sampling System (SENTRY PASS), is operable with the exception of training of technicians for in-line sampling and analysis. This training is scheduled to be completed by July 25, 1984.

Enclosure 1 describes PGandE's Sentry Post Accident Sampling Capability which meets the requirements of Section II.B.3 of NUREG 0737 and license condition 2.C.(8)h of Operating License Number DPR-76. Enclosure 2 discusses the results of SENTRY PASS functionality tests. Enclosure 3 summarizes PGandE's response to Region V Inspection Report (No. 50-275/84-18) issues.

This letter also clarifies SSER 14 commitments and information contained in PGandE's submittal of September 8, 1984 discussing post accident sampling capability.

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

Sincerely,

For J. O. Schuyler

Enclosures

cc: J. B. Martin
Service List

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ENCLOSURE 1

DESCRIPTION OF SENTRY POST ACCIDENT SAMPLING CAPABILITY

The SENTRY Post Accident Sampling System (SENTRY PASS), which is the primary method for post accident sampling at Diablo Canyon Unit 1, is operable with the exception of training for in-line sampling assessment. This in-line sample assessment training for the shift chemical and radiation protection technicians is scheduled to be completed by July 25, 1984. All other training has been completed and associated procedures have been approved. The combination of equipment, procedures, and trained technicians provides a PASS capability which satisfies the requirements of Section II.B.3 of NUREG 0737 and license condition 2.C.(8)h of Operating License Number DPR-76.

The SENTRY PASS is the permanent system for providing post accident sampling capability. The SENTRY PASS supersedes the combined Interim Post-Loca Sampling System (Liquid) and the air sampling portion of the SENTRY PASS as described in PGandE's submittal of September 8, 1983. The SENTRY PASS is considered functional based on satisfactory performance during the test program conducted during July 1984. Table 1 lists the initial demonstration acceptance guidelines and was the basis for determining satisfactory performance. Discussion of the testing process and results are provided in Enclosure 2. The acceptance guidelines are established in approved procedure STP-G-14, Revision 1. Performance capability of the SENTRY PASS is defined by completion of the following aspects related to post accident sampling:

1. Initial demonstration of functionality of the SENTRY PASS:

   The SENTRY PASS tests and sampling results taken during July 1984 meet the acceptance guidelines.

2. Procedures for operation of the SENTRY PASS:

   Procedures EP RB-15 and EP RB-16 were approved on July 20, 1984 pending independent verification. Independent verification is scheduled to be completed by July 25, 1984.

3. Training of technicians for the SENTRY PASS:

   Training on the SENTRY PASS for technicians on shift has been completed, with further training on in-line sampling scheduled to be completed by July 25, 1984.

4. Acceptance criteria for sampling on the SENTRY PASS:

   Procedure STP-G-14, Revision 1, identifying the acceptance criteria for post accident sampling, was approved on July 20, 1984.

5. Maintenance capability and surveillance procedures:

Surveillance criteria for post accident sampling is provided in Procedure STP-G-14. When these surveillance criteria are not met, corrective actions, including maintenance activities, are initiated.

The overall capability for post accident sampling is augmented by the Interim Post-Loca Sampling System, radiological monitors, radiological samplers and grab sample capability. Together, this equipment is capable of providing alternative methods of post accident sampling for reactor coolant, radioactive iodines and particulates in plant gaseous effluents, and containment atmosphere. The use and operation of this equipment is described in established procedures. Procedure STP-G-14 describes alternatives to be used in the event of a SENTRY PASS component malfunction (Table 2).

Those issues related to post accident sampling which were identified in NRC Region V Inspection Report No. 50-275/84-18 are addressed in Enclosure 3. In particular, with respect to item C of the Inspection Report, a definition of operability for the overall post accident sampling capability is found in approved plant procedures and provides for alternative methods of post accident sampling.

TABLE 1

Initial Demonstration Acceptance Guidelines

(From STP-G-14)

Parameter		Guidelines[1]
a.	Reactor Coolant	
1.	Visual Inspection	Visually inspect the equipment for leakage prior to and during the sampling exercise and after sampling is completed.
2.	Sampling of the RCS	Perform a sampling from either the hot leg or the RHR pump discharge in accordance with applicable procedures. Collect both diluted and undiluted samples.
3.	Perform analyses for boron, dissolved hydrogen, dissolved oxygen, pH, conductivity chloride, and isotopic analysis by gamma spectroscopy. Also, perform the same analyses on a separate RCS sample in the normal manner. Record both sets of data.	Boron[2] $\pm$ 20% when greater than 100 ppm; Dissolved hydrogen $\pm$ 15% when H_2 is between 10 and 2000 cc/kg; Dissolved oxygen $\pm$ 10% for 0.1 to 20 ppm; pH $\pm$ 0.5 pH units; conductivity $\pm$ 5% for 1.0 to 20 micromhos/centimeter. Chloride $\pm$ 10% for 1.0 to 20 ppm, and $\pm$ 15% for 0.1 to 1.0 ppm. Radioactivity within a factor of 2 when the 95% counting error is less than one-tenth of the measured net activity.
4.	Sampling Reactor Cavity Sump	Establish sample purge for the reactor cavity sump to verify sample availability.
5.	Identified Deficiencies	Note any identified deficiencies, and initiate a problem report. If there is system leakage, determine whether the acceptance criteria of the leakage surveillance test procedure has been exceeded.

TABLE 1
(Continued)

Parameter	Guidelines[1]
b. Containment Atmosphere	
1. Sampling of the containment atmosphere.	Perform a sampling of the containment atmosphere in accordance with applicable procedures.
2. Perform analyses for gaseous hydrogen and oxygen[3], and for noble gases and radioiodines and particulates. Perform the same analyses in the normal manner for comparison purposes. Record both sets of data.	Containment hydrogen ± 15% when H_2 volume is between 0.1% and 10% by volume. Radioactivity within a factor of 2 when the 95% counting error is less than one-tenth of the measured net activity.
3. Identified deficiencies.	Note any identified deficiencies, and initiate a problem report.

Footnotes

1 - Radioactivity guideline is based on NRC guidance. Guidelines for dissolved hydrogen, dissolved oxygen, pH, conductivity, chloride and containment hydrogen are based on vendor information.

2 - The ± 20% guideline for boron analysis meets the intent of Criterion (10) of NUREG 0737, Item II.B.3, which states, "Accuracy, range and sensitivity shall be adequate to provide pertinent data to the operator in order to describe radiological and chemical status of the reactor coolant systems." Additionally, the stated accuracy of the carminic acid spectrophotometric method from a recognized evaluation of the method is ± 15% with a footnote which states, "In the procedure presented, uncertainty of the method was not included; based on professional judgment the uncertainty has been estimated at ± 20%", from "Evaluation of GE & SEC Chemical Procedures for Post Accident Analysis of Reactor Coolant Sample, November 1981". Prepared by Exxon Nuclear Idaho Company, Inc., Idaho National Engineering Laboratory, Idaho Falls, Idaho, for the Nuclear Regulatory Commission. Table 5 on page 30. A guideline narrower than ± 20% will require installation of new hardware.

3 - Available 3/31/85 or sooner.

TABLE 2

ALTERNATE METHODS OF POST-ACCIDENT PARAMETER SAMPLING

(FROM STP-G-14)

PASS FUNCTION	ALTERNATE METHOD	ANALYSIS/REMARKS
1. Containment Atmosphere		
a. Hydrogen	1. Read H_2 concentration from Cels 82 or 83 recorded on PAM1 in Control Room, or, 2. Grab sample from PASS or RE 11/12	1. Record data 2. Gas chromatography
b. Radionuclides	1. Read RE-30 or RE-31 and correlate exposure rate to degree of core damage, or 2. Grab sample from RE-11/12, or 3. Read exposure rate outside of containment wall with portable dose rate survey meter and correlate to the degree of core damage.	1. Record data, refer to EP RB-14 2. Spectrum analysis 3. Refer to EP OP-1
2. Reactor Coolant		
a. Hydrogen	1. Grab sample from PASS or Primary Sample Room	1. Gas chromatography
b. Oxygen	1. Grab sample from PASS or Primary Sample Room (not mandatory)	1. Gas chromatography
c. Boron	1. Grab sample from Primary Sample Room, or, 2. Calculate final boron concentration from pre-accident concentrations and effects of water injected.	1. Titrimetric or colorimetric
d. pH	1. Grab sample from PASS or Primary Sample Room	1. pH meter

TABLE 2
(Continued)

ALTERNATE METHODS OF POST-ACCIDENT PARAMETER SAMPLING

PASS FUNCTION	ALTERNATE METHOD	ANALYSIS/REMARKS
2. Reactor Coolant (Cont'd)		
e. Radionuclides	1. Correlate exposure rate in containment to degree of core damage using RE-30, RE-31 or by determining exposure rate outside of the containment wall using a portable survey meter.	1. Refer to RB-14 or EP OP-1
	2. Grab sample from Primary Sample Room	2. Spectrum analysis
f. Chloride	1. Grab sample from PASS or Primary Sample Room	1. Ion chromatography 2. Selective ion electrode 3. Colorimetric 4. Titrimetric
g. Conductivity	1. Grab sample from PASS or Primary Sample Room	1. Conductivity bridge
3. Plant Vent Mid and High Range Radio-iodines and Particulates	1. Collect iodine sample from RE-32 or RX-40	1. Spectrum analysis or exposure rate - see EP RB-12
	2. Read or collect iodine sample from RE-24	2. Local reading, or spectrum analysis

ENCLOSURE 2

DISCUSSION OF SENTRY FUNCTIONALITY TESTS

The SENTRY Post Accident Sampling System (PASS), which is the principal system for post accident sampling at Diablo Canyon Unit 1, has been tested in accordance with Surveillance Test Procedure G-14, Revision 1, "Operability Determination of Post Accident Sampling Program". The results are compared to sample analysis results obtained from normal sampling and accuracy guidelines are used to determine if the various aspects of the SENTRY system are performing satisfactorily. Comparison of the sample analysis results indicated system acceptability for the accuracy guidelines consistent with Table 1 of Enclosure 1. In several cases, the measured parameter concentration was below the range specified for the accuracy guideline; where possible in such cases, a calibration standard was run to test the SENTRY performance. For example, the reactor coolant chloride indicated less than 0.02 ppm on the SENTRY in-line ion chromatograph, and the normal laboratory analysis by ion chromatography indicated 0.008 ppm. A calibration check solution containing 2000 ppm boron and 1 ppm chloride was analyzed and the results indicated were within 10 percent of the calibration curve which satisfies the accuracy guideline.

The performance capabilities of the SENTRY system have been satisfactorily completed for the following:

1. Reactor coolant radioactivity, liquid and gaseous
2. Reactor coolant boron
3. Reactor coolant dissolved hydrogen
4. Reactor coolant dissolved oxygen
5. Reactor coolant chloride
6. Reactor coolant conductivity
7. Reactor coolant pH
8. Reactor coolant sump sample availability
9. Containment atmosphere hydrogen
10. Containment atmosphere radioactivity, noble gases and radioiodines and particulate

ENCLOSURE 3

DISCUSSION OF REGION V INSPECTION REPORT (No. 50-275/84-18) ISSUES

Several issues requiring resolution were raised in the Region V Inspection Report No. 50-275/84-18. The status of these issues is as follows:

A. System Performance As A Function of RCS Pressure

Tests of sample flow rate as a function of system pressure have been performed. For SENTRY, the hot leg sample flow rates are adequate to complete purging, sampling and analysis within the required time at pressures between normal operation and a pressure corresponding to the pressure where transfer to the RHR system would be made. For the Interim Post Loca Sampling System (IPLSS), the purge criterion of six sample line volumes would have to be lowered to approximately 4.9 sample line volumes (i.e., for 50 minutes purge time) in order to meet the 3-hour sample evaluation criterion at a pressure corresponding to that where transfer to the RHR system would be made. The six sample line volumes criterion would require approximately 61 minutes, which would require about 11 minutes past the 3-hour sample evaluation criterion.

B. Diluter Valve Variation With Pressure

A pressure regulator valve was installed upstream of the diluter valves on the IPLSS. Both SENTRY and IPLSS were tested for diluter valve variation with RCS pressure. The diluter valves on IPLSS no longer exhibit a variation with system pressure and SENTRY does not exhibit diluter valve variation with system pressure.

C. Definition of System Operability

Surveillance Test Procedure G-14, Revision 1, "Operability Determination of Post Accident Sampling Program", was approved on July 20, 1984. This procedure provides a definition of system operability.

D. Doses to Operators From Exhaust Plenum

The tolerable leakage for both IPLSS and SENTRY has been determined and incorporated into the leakage surveillance test procedure (STP-M-86 series) as acceptance criteria. This surveillance is scheduled to be completed by July 25, 1984.

E. Sampling Capability Listed in SSER 14

With the SENTRY PASS functional the reactor cavity sump, pressurizer and letdown can be sampled. The availability at normal operating conditions of the pressurizer steam space, liquid space and letdown sample capabilites have been tested. The SENTRY PASS does provide for analysis of dissolved oxygen, pH and conductivity. This capability has been demonstrated.