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SUBJECT: Advises that SENTRY post-accident sampling sys (SENTRY PASS) will be operable prior to criticality.Description on SENTRY PASS capability & functionality tests encl.Sys meets requirements of NUREG-0737,Section II.B.3.

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JAMES D. SHIFFER
VICE PRESIDENT
NUCLEAR POWER GENERATION

February 1, 1985

PGandE Letter No.: DCL-85-047

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. 50-323
Diablo Canyon Unit 2
Operability of PASS

Dear Mr. Knighton:

The primary method for post accident sampling at Diablo Canyon Unit 2, the SENTRY Post Accident Sampling System (SENTRY PASS), will be operable prior to criticality.

Enclosure 1 describes PGandE's Sentry Post Accident Sampling Capability which meets the requirements of Section II.B.3 of NUREG 0737. Enclosure 2 discusses the SENTRY PASS functionality tests.

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

Sincerely,

J. D. Shiffer

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 2, has been demonstrated to have the capability to provide a liquid diluted, undiluted or pressurized grab sample. The in-line chemical analyses panel and containment air sampling panel will be operable prior to Unit 2 criticality. Training on PASS has been completed and associated procedures have been approved. The combination of equipment, procedures, and trained technicians provides a PASS capability which will satisfy the requirements of Section II.B.3 of NUREG 0737.

The SENTRY PASS is the permanent system for providing post accident sampling capability. Table 1 lists the initial demonstration acceptance guidelines and is 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:

   Post-LOCA Sampling System Preoperational Test 11.5 was begun in December 1984. Portions addressing valve operation, alarms, high temperature interlock, reactor coolant grab samples and reactor cavity sump grab samples have met acceptance guidelines. The chemical analysis panel test will be completed when RHR recirculation is available.

2. Procedures for operation of the SENTRY PASS:

   Procedures EP RB-15 and EP RB-16 are approved and are applicable to both units.

3. Training of technicians for the SENTRY PASS:

   Training on SENTRY PASS for technicians on shift has been completed.

4. Acceptance criteria for sampling on the SENTRY PASS:

   Procedure STP-G-14, Revision 1, identifying the acceptance criteria for post accident sampling, has been approved.

5. Maintenance capability and surveillance procedures:

   Surveillance acceptance criteria for post accident sampling is provided in Procedure STP-G-14. When these acceptance criteria are not met, corrective actions, including maintenance activities, are initiated. Chemical Analysis Procedure G-3 specifies routine maintenance for the system. This procedure will be implemented on Unit 2 prior to criticality.

The overall capability for post accident sampling is augmented by 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).

ENCLOSURE 2

DISCUSSION OF SENTRY PASS FUNCTIONALITY TESTS

The SENTRY Post Accident Sampling System (PASS), which is the principal system for post accident sampling at Diablo Canyon Unit 2, will be tested in accordance with Surveillance Test Procedure G-14, "Operability Determination of Post Accident Sampling Program." The results will be compared to sample analysis results obtained from normal sampling and accuracy guidelines will be used to determine if the various aspects of the SENTRY system are performing satisfactorily. Sample analysis results will meet the accuracy criteria listed in Table 1, Enclosure 1. In some cases, the measured parameter concentration may be below the range specified for the accuracy guideline; where possible in such cases, a calibration standard will be run to test the SENTRY performance.

The performance capabilities of the SENTRY system will be satisfactorily completed for the following prior to Unit 2 criticality:

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[1]
7. Reactor coolant pH
8. Reactor coolant sump sample availability
9. Containment atmosphere hydrogen
10. Containment atmosphere radioactivity, noble gases and radioiodines, and particulates

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Footnotes

1 - PGandE is currently reviewing the requirement for conductivity analysis.

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[3], 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[3], $\pm$ 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[4], 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[3], 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 - PGandE is currently reviewing the requirement for conductivity analysis.

4 - Available by 3/31/85.

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-11
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 EP RB-14 or EP OP-1[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

Footnotes

1 - EP RB-14 is being revised to include core damage assessment by the use of portable survey meters. When completed, this reference to EP OP-1 will be deleted.