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SUBJECT: Forwards changes to post-accident sampling descriptions per NUREG-0737,Item II.B.3 & 821112 meeting.Changes will be incorporated in FSAR amend to be submitted late Dec 1982.

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November 30, 1982

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

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

On November 12, 1982, representatives of Southern California Edison Company (SCE) met with staff members of the Nuclear Regulatory Commission (NRC) in Bethesda, Maryland. The purpose of the meeting was to discuss the requirements of NUREG-0737, Item II.B.3 Post-Accident Sampling Capability (PASS) and clarification provided by NRC letter dated June 30, 1982 on Docket No. 50-206.

At the meeting, SCE discussed plans for complying with the subject requirements. In particular, SCE's plans for obtaining and analyzing a PASS sample within three hours and provisions for chloride analyses were discussed. The purpose of this letter is to provide, consistent with the meeting discussion, changes to the PASS descriptions in the Final Safety Analysis Report (FSAR) for San Onofre Nuclear Generating Station, Units 2 and 3. Seven copies of the changes are enclosed. These changes will be incorporated in the next amendment to the FSAR to be submitted to the NRC in late December, 1982.

Additional FSAR changes are currently being prepared to incorporate in the FSAR those changes to the PASS system that were required to make the PASS operable. Those changes were previously discussed with the NRC in September, 1982 and will also be incorporated in the next amendment to the FSAR.

If you have any questions, please call me.

Very truly yours,

M. O. Medford for KPB

Enclosures

cc: Harry Rood (w/enclosure)

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containment atmosphere samples should be representative of the reactor coolant in the core area and the containment atmosphere following a transient or accident. The sample lines should be as short as possible to minimize the volume of fluid to be
23 taken from containment. The residues of sample collection should be returned to containment or to a closed system.

b. The ventilation exhaust from the sampling station should be filtered with charcoal adsorbers and high-efficiency particulate air (HEPA) filters.

RESPONSE

1.1 GENERAL DESCRIPTION

FSAR subsection 9.3.2 has a detailed description of the existing process sampling system presently installed in San Onofre Units 2 & 3. The following additional sampling system is being added to specifically address the NRC requirements for post-accident sampling (NUREG-0578, Clarification to NUREG-0578, NUREG-0660, NUREG-0694, NUREG 0737). This new emergency sampling system will be installed ~~prior to operation above 5% power~~ and operable prior to January 1, 1983 for Unit 2 and prior to exceeding 5 percent power for Unit 3. A review of the reactor coolant and containment atmosphere sampling systems and the radiological spectrum and chemical analysis facilities
23 has been conducted. Plant modifications are being implemented to permit personnel to obtain and analyze a sample~~s~~ within 3 hours after a decision is made to take a sample (without incurring an exposure to an individual in excess of five rem whole-body or 75 rem to the extremities). Provisions will be made to allow a chloride analysis as discussed in Section 1.2 ~~within four days~~. These plant modifications, collectively referred to as the post-accident sampling system (PASS), are illustrated schematically by figures II.B.3-1,
28 II.B.3-2 and II.B.3-4.

Procedures will be developed for obtaining and analyzing these samples.

Operation of the PASS does not require isolated auxiliary systems to be placed in operation. However, portions of piping in the isolated containment waste gas header and the reactor coolant drain tank header are
23 utilized to return sample effluent fluids and gasses to the containment. These sections of piping are included in the leak-test program described in item III.D.1.1.

1.2 DESIGN CRITERIA

Modification of currently existing plant facilities allows plant personnel to obtain and analyze pressurized and unpressurized reactor coolant samples and a containment air sample within 3 hours.

Replace with the attached INSERT

Onsite facilities and procedures are being developed which provide the
23 capability to quantify the following:

A. Certain isotopes that are indicators of the degree of core damage (i.e., noble gases, iodines, cesiums, and non-volatile isotopes), Modification of currently existing facilities allows plant personnel to obtain and analyze one sample from within the containment within three hours of the time the decision is made to take a sample. The initial sample will be selected by procedure to be taken from that point or sample media which is most representative of core condition for each particular category of plant accident. Subsequent sampling and analyses of the same or alternate sample points can each be performed in an additional three hour time period.

Prior to the decision to take a sample certain activities shall be completed to insure adequate preparation and handling of the radioactive sample media. The activities include:

1. Assemble chemistry personnel with implementation of health physics requirements including anti-contaminant clothing and personnel dosimetry.

2. Dispatch personnel to the PASS Sample Laboratory employing post accident precautions.

3. Verify a safe atmosphere in the PASS Sample Laboratory which is considered to be an enclosed space.

4. Conduct health physics survey of the PASS Sample Laboratory.

5. Energize and verify the PASS status.

6. Select, by procedure, the initial sample point and sample media.

Should the initial sample media selection be that of a coolant liquid sample, the PASS has the capability within three hours to perform by in-line instrumentation an analysis of total dissolved gas, hydrogen and oxygen concentration of the evolved gas, pH, boron concentration, and fission product specific radioactivity and to perform the collection of an undiluted chloride grab sample. Should backup grab sampling for the in-line instrumentation be desired, a diluted sample may be obtained.

Should the initial sample media selection be that of the containment building atmosphere, the PASS has the capability within three hours to peform by in-line instrumentation an analysis of the hydrogen concentration and fission product specific radioactivity. Should backup grab sampling for the in-line instrumentation be desired, a diluted sample may be obtained.

Following the initial sample, a second complete analysis of the same or an alternate sample would require an additional three hours. Subsequent samples for specific parameters(such as boron or radioactivity) may be taken and analyzed within shorter periods of time than required for a full analysis.

Analysis of the reactor coolant sample for chloride concentration shall be accomplished through one of two alternate means. These are the use of an undiluted grab sample for subsequent offsite analysis or the use of on-site analysis.

A shielded container will be utilized to obtain an undiluted grab sample to minimize radiation exposure to personnel taking the sample. The shielded container will be placed inside a shipping cask. The inner shielded container and the outer cask together will be capable of containing radiation to the current Department of Transportation(DOT) requirements as defined in 49CFR173 at the outer surface of the cask during normal shipping conditions. The cask containing the undiluted grab sample may then be transported offsite for analysis. The results of the analysis conducted offsite will be available within four days.

On-site analysis for chloride is designed as a several step process. A diluted grab sample can be obtained and analyzed with a threshold sensitivity of 10 ppm. An undiluted grab sample can be obtained and stored in a shielded vessel until such time that the radiation levels have decayed to allow on-site analysis. Verification that reactor coolant hydrogen concentration is above 10 cc/kg can be performed using PASS in-line instrumentation. Finally, the coolant dissolved oxygen concentration can be monitored within the range of 0 to 20 ppm using in-line instrumentation. The capability for dissolved oxygen measurement will be available after about October 1, 1983.

B. Hydrogen levels in the containment atmosphere in the range of 0 to 10 volume %.

C. Dissolved gases (i.e., H_2, O_2) and boron concentration of liquids.

The onsite facility design and procedures satisfy the following criteria:

A. Provisions are included to permit containment atmosphere sampling under both positive and negative containment pressure.

B. Provisions are included for purging sample lines, for reducing plateout in sample lines, for minimizing sample loss or distortion, for preventing blockage of sample lines by loose material in the RCS or containment, for appropriate disposal of the samples, and for passive flow restrictions to limit reactor coolant loss or containment atmosphere leakage from a rupture of the sample line.

C. The PASS sampling lines and components conform to Quality Group D and Seismic Category II requirements. If the classification of the system to which a PASS sample line is attached is higher than the classification of the PASS, then the PASS piping up to the first isolation valve meets the higher classification as shown in figure II.B.3-1.

D. Provisions are included to identify and quantify the isotopes of the nuclide categories discussed above in the range from approximately 1 μCi/g to levels corresponding to an initial reactor coolant radiochemical spectrum resulting from a Regulatory Guide 1.4 (Revision 2) release. Where necessary, sample dilution is used to provide the capability for measurement using onsite installed multi-channel analysis equipment and for reduction of personnel exposure.

E. Provisions are included to measure total dissolved gas concentrations up to approximately 2000 cc/kg.

F. Provisions are included to restrict background levels of radiation in the radiological and chemical analysis facility from sources such that the sample analysis provides results with an acceptably small error (approximately a factor of 2). This is accomplished through the use of sufficient shielding around samples and outside sources, and by the use of a ventilation system design, including a charcoal filter and HEPA filters which will control the presence of airborne radioactivity. 23

G. Provisions are included to maintain plant procedures which identify the analyses required, measurement techniques, and background level reduction methods.

9.3.6 POST-ACCIDENT SAMPLING SYSTEM

9.3.6.1 Design Basis

The post-accident sampling system design bases are as follows:

A. The post-accident sampling system (PASS) provides a means to obtain and analyze pressurized and unpressurized reactor coolant liquid and containment atmosphere samples. ~~within 3 hours after a decision is made to take a sample.~~ A reactor coolant sample can be drawn directly from the reactor coolant system (RCS) whenever the RCS pressure is between 200 lb/in.^{2}g. and 2485 lb/in.^{2}g. At pressures below 200 lb/in.^{2}g., RCS samples can be drawn via the ESF pump miniflow recirculation line sample line. A containment atmosphere sample can be drawn with containment pressure between 10 lb/in.^{2}a. and 75 lb/in.^{2}a.

B. The PASS provides a means to quantify the parameters identified in items 1 through 3, below, while conforming to criteria identified in items 4 through 8, below.

1. Certain isotopes that are indicators of the degree of core damage (i.e., noble gases, iodines, cesiums, and non-volatile isotopes).

23 2. Dissolved gases (i.e., H2, O2), boron concentration, chloride concentration, and pH of the reactor coolant. Total gas concentrations of up to approximately 2000 cc/kg (STP) can be measured.

3. Hydrogen levels in the containment atmosphere in the range of 0 to 10 volume %.

4. The PASS allows for sampling post-accident with resulting personnel radiation exposure not exceeding five and 75 Rem to the whole body and extremities, respectively.

5. The PASS is capable of accommodating an initial reactor coolant radiochemistry spectrum corresponding to Regulatory Guide 1.4, Revision 2, or 1.3 Revison 1 release.

6. All sample flow is returned to the containment to preclude unnecessary contamination of other auxiliary systems and to ensure that high level waste remains isolated within the containment.

7. Outside of the containment isolation valves and the safety injection system isolation valve to the sampling system, components and piping are designed to Quality Group D non-seismic requirements. This complies with NUREG-0578 Section 2.1.8.a for equipment downstream of the second isolation valve from safety code systems.

8. Process Sampling points capability and design data for the PASS are shown in table 9.3-14. Table 9.3-15 provides the analysis capabilities for the PASS.

Table 9.3-15

DISCRETE ANALYSIS CAPABILITIES

A. Liquid Analyses

1. pH
2. Boric Acid Concentration
3. Total Dissolved Gas Concentration
4. Fission Product Content and Activity
5. Dissolved Hydrogen, volume percent
6. Dissolved Oxygen, volume percent
9. Chloride (a)
10. Dissolved Oxygen Concentration, ppm (after October 1, 1983)

B. Containment Atmosphere

7. Hydrogen
21 8. Fission Product Content and Activity

C. Sample lines connected to ASME Section III code class lines are constructed in accordance with the same code class up to and including the first normally closed, automatic, or throttling valve.

D. The pressure and temperature ratings of the sample lines and components correspond to the rating of the particular system being sampled up to and including the system throttling valves. Downstream of the throttling valve or orifice, sample piping pressure and temperature are reduced to correspond to downstream process conditions, and relief protection is provided where appropriate.

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23 (a) By undiluted grab sample within 4 days.