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March 2, 1984

Director, Office of Nuclear Reactor Regulation
Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-206, 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 1, 2 and 3

Technical Specification 6.13.1 for San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS 2 and 3) requires Nuclear Regulatory Commission (NRC) approval of the Process Control Program (PCP) prior to shipment of "wet" solid radioactive waste. Southern California Edison Company (SCE) submitted the PCP for SONGS 2 and 3 to the NRC in November 1981, and submitted the Chem-Nuclear Inc., Topical Report in January 1982. In June 1982 and in December, 1983, SCE responded by letter to NRC questions regarding the PCP.

By Federal Register Notice dated December 27, 1982 (47FR57446), the Nuclear Regulatory Commission amended its regulations to provide specific requirements for licensing facilities for the land disposal of low-level radioactive waste. The majority of these requirements are contained in a new Part 61 to Title 10 of the Code of Federal Regulations (10 CFR 61) entitled "Licensing Requirements for Land Disposal of Radioactive Waste." Some additional requirements directed primarily at waste generators and handlers including certification and use of shipping manifests were concurrently published as a new Section 20.311 of Part 20 to Title 10 (10 CFR 20.311) entitled "Standards for Protection Against Radiation." The effective date for these regulatory changes is December 27, 1983.

10 CFR 20.311 requires that any licensee who tranfers radioactive waste to a land disposal facility or to a licensed waste collector or processor must classify the waste according to Section 61.55 of 10 CFR 61. This section defines radioactive waste suitable for disposal as falling into one of three classes (Class A, Class B or Class C), and waste is determined to fall into one of the classes by comparison to limiting concentrations of some particular listed radionuclides. Class B and Class C wastes are subject to waste stability requirements which are set forth in Section 61.56 of the rule. In addition, Section 20.311 also requires that waste generators record on shipment manifests a description of the transferred waste as well as a certification that the waste is properly classified and that the manifest is filled out correctly. Licensees must also conduct a quality control program to assure compliance with the waste classification and waste stability requirements.

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The purpose of this letter is to describe the program that will be used at SONGS 1, 2 and 3 to implement the requirements of 10 CFR 61 and 10 CFR 20.311. Accordingly, enclosed is a program description for waste classification and waste form. With this submittal it is requested that the NRC proceed promptly with the approval of the PCP for SONGS 2 and 3.

If you have any questions, please call me.

Very truly yours,

M. O. Medford

Enclosure

cc: H. Rood - NRC (w/encl)
A. E. Chaffee (NRC Resident Inspector w/encl.)

Enclosure

DOCKET NOS. 50-206, 50-361 AND 50-362
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 1, 2 AND 3

SUBJECT: Implementation Program for 10 CFR 61 and 10 CFR 20.311

References:
A) Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification, May 1983

B) Low-Level Waste Licensing Branch Technical Position on Waste Form, May 1983

C) AIF Report "Methodologies for Determining the Classification of Low-Level Radioactive Waste from Nuclear Power Plants", August 1983

D) Topical Quality Assurance Manual, Revision 2, November 30, 1983, San Onofre, Units 1, 2 and 3

E) Chem-Nuclear Systems, Inc. Mobile Cement Solidification System Topical Report, CNSI-2 (43-13-01354-0IP-A)

F) Letter Jim Staehr (CNSI) to Dave Duran (SCE), Subject: Draft Addendum to Topical Report, October 27, 1983

G) Chem-Nuclear Topical Report CNSI-WF-C-01-NP "10 CFR 61 Waste Form Certification-Cement," November 30, 1983

H) State of Washington Radioactive Materials License WN-1019-2, Amendment Number 16, December 23, 1983

I) Chem-Nuclear Topical Report CNSI-DW-11118-01, CNSI Dewatering Control Process Containers Topical Report, December 23, 1983

INTRODUCTION

By Federal Register Notice dated December 27, 1982 (47 FR 57446), the Nuclear Regulatory Commission amended its regulations to provide specific requirements for licensing facilities for the land disposal of low-level radioactive waste. The majority of these requirements are contained in a new Part 61 to Title 10 of the Code of Federal Regulations (10 CFR 61) entitled "Licensing Requirements for Land Disposal of Radioactive Waste." Some additional requirements directed primarily at waste generators and handlers including certification and use of shipping manifests were concurrently published as a new Section 20.311 of Part 20 to Title 10 (10 CFR 20.311) entitled "Standards for Protection Against Radiation." The effective date for these regulatory changes was December 27, 1983.

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DISCUSSION

A. Waste Classification

The SONGS implementation program will utilize a series of annual and batch samples to gather the data needed for waste classification. The samples will be taken as close as possible to the point where the waste is placed in the disposal package. For SONGS 2 and 3, SCE is designing and installing an in-line sample system just upstream of the solidification system to accomplish this purpose. This approach is consistent with the requirements stated in the May 1983 Branch Technical Position on radioactive waste classification (Reference A). Since Section 61.55 requires quantification of several difficult to measure non-gamma emitters, which are beyond the analytic capabilities available at SONGS, a periodic analysis will be needed by an offsite laboratory. The results of the offsite analysis are used to develop a set of normal expected nuclide concentrations and correlations to relate difficult to measure non-gamma emitters to easily measured gamma emitters. These measured waste stream correlations obtained at SONGS will be used with the plant sampling and analysis programs to arrive at the identity and activity of the radionuclides contained in each package to be shipped offsite for disposal. Based upon the actual concentrations arrived at in the waste package the waste is classified. Should SONGS experience an operating condition which could change the classification methodology then a new set of offsite analyses will be obtained.

In addition to the actual waste stream analyses and corresponding classification discussed above, SONGS will use the generic scaling factors contained in the AIF report (Reference C) as an alternate classification method. This method relates easily measured key isotopes in the plant primary coolant system (Co-60, Cs-137) to difficult to measure non-gamma emitters (Ni-63, Sr-90, I-129, etc.) present in radwaste streams. The generic scaling factors provided in the AIF report are based on developing a material balance between the inventory seen in the primary reactor coolant and the inventory in radwaste streams.

1. Sampling Program

A new Health Physics Procedure SO123-VII-8.15 "10 CFR 61 Waste Sampling Program" describing the functional requirements which will be followed to identify the required sampling points and the frequency for obtaining radioactive waste samples is under development. Waste Streams to be sampled at SONGS 1 are Dry Active Waste (DAW), Spent Resin, Filters, Spent Fuel Pool Waste, Low Purity Wet Waste (Monitor Tank) and secondary side wet waste (Oily Waste Sump, Yard Drain Sump, etc.). Waste streams to be sampled at SONGS 2 and 3 include DAW, Spent Resin, Cartridge Filters, Backflushable Filters (Crud Tank Filters), Evaporator Concentrates, Radwaste Sump Filter, Decon Trailer waste and Spent Fuel Pool waste.

2. Sample Analysis and Correlation Implementation

SONGS currently has a purchase order for offsite radwaste sample analysis services with General Atomic in San Diego. General Atomic has been performing offsite analysis of SONGS radwaste samples for over two years. Many of the radionuclides required to be identified by 10 CFR 61 (Sr-90, transuranics) have been routinely analyzed for by General Atomic to show compliance with the Hanford Burial site license. During the second half of 1983, SONGS sent several waste samples to General Atomic to perform a complete 10 CFR 61 analysis. SONGS 1 samples included a low level compactable trash masslin sample, a high level compactable waste masslin sample from containment, a radwaste holdup tank room floor residue sample, a spent resin return filter sample, a spent fuel pool sludge sample, a Reactor Coolant Pump Seal Water Filter sample, decon drain tank sample, a spent fuel pool trash masslin sample, and a radwaste discharge filter sample. SONGS 2 and 3 samples sent to General Atomic included a dry active waste sample, a crud tank filter sample, and a freon filter sample from the Quadrex Decon Trailer. Complete 10 CFR 61 analysis results for the above samples are available. In addition, the following samples have been shipped to General Atomic and are presently being analyzed, Radwaste Process Filter (Unit 1), Boron Filter (Unit 1), Spent Resin Cask Wash Down Drain Line Sample (Unit 1), Refueling Water Storage Tank Filter (Unit 1), NAC Spent Fuel Cask Waste (Unit 1), Monitor Tank Sludge (Unit 1), Crud Tank Filter Sample (Units 2/3), Cartridge Filter MF-26 (Units 2/3), Cartridge Filter MF-15 (Units 2/3), Cartridge Filter FO14 (Units 2/3), Radwaste Sump Filter (Units 2/3), and Decon Trailer Filter (Units 2/3).

A purchase order has been awarded to EAL Corporation in Richmond, California for 10 CFR 61 sample analysis. All future radwaste sample analysis will probably be done under the EAL contract. General Atomic will serve as a back-up laboratory for the duration of their contract (December 31, 1984). Samples about to be sent to EAL include reactor coolant sample (Unit 1), a future resin sample

when available (Unit 1), Grade 10 source (Unit 1), reactor coolant sample (Unit 2), reactor coolant sample (Unit 3), spent resin sample (Units 2/3), spent fuel pool waste sample when available (Unit 2, Unit 3), an evaporator concentrate sample when available (Unit 2/3), and a laundry filter sample (Units 2/3).

The analysis results from the above samples will be used to determine site specific correlation factors for Ni-63/Co-60, Tc-99/Cs-137, I-129/Cs-137, Sr-90/Cs-137, Pu-239/240/Ce-144 if Ce-144 detectable, TRU/Pu-239/240, Pu-241/Ce-144 if Ce-144 detectable, and Cm-242/Ce-144 if Ce-144 detectable. Since no useful correlations have yet been determined for C-14 or H-3, the default values determined from specific waste stream analyses will be used. As a secondary method, the H-3 and C-14 levels in specific waste streams may be inferred by using the scaling factors in the AIF report with the SONGS primary coolant system analysis results.

3. Waste Classification

Health Physics Procedure SO123-VII-8.1 "Solid Radioactive Waste Packaging, Labeling and Shipping" addresses the requirements for disposal of radwaste at the Richland, Washington and Beatty, Nevada burial sites in accordance with Department of Transportation (DOT), NRC, state of Washington, and state of Nevada requirements. This procedure is being revised to incorporate the new 10 CFR 61 requirements as well as revised radioactive material licenses for the Richland, Washington and Beatty, Nevada burial sites. The revision to SO123-VII-8.1 will include instructions on preparing the new U.S. Ecology manifest for the Richland, Washington and Beatty, Nevada burial sites, labeling containers in accordance with 10 CFR 61 and the Richland, Washington and Beatty, Nevada burial site licenses, and other new requirements included in the revised burial site licenses. No radwaste shipments will be made from SONGS to either burial site until obtaining final revisions of the burial site licenses and revision of SO123-VII-8.1 to incorporate these changes. It is expected that the first radwaste shipment from SONGS made under the new 10 CFR 61 criteria will occur in mid-February.

4. Quality Control Program

Section 8-F of the Topical Quality Assurance Manual (TQAM) (Reference D) describes the quality assurance program provisions which are applied to the Health Physics/Radiation Protection Program at SONGS. The quality assurance provisions stipulated in the TQAM incorporate the applicable portions of the Quality Assurance Manual consistent with the requirements stipulated in 10 CFR 20, 10 CFR 61, 10 CFR 71 and Regulatory Guides 8.2, 8.8 and 8.10 as implemented by the SONGS Health Physics Manual. The Radioactive Waste Management program at SONGS, which is responsible for the safe transfer, packaging and transport of low-level radioactive material, falls under the Health Physics/Radiation Protection Program.

The Quality Assurance Organization conducts audits to verify that (1) management approved, detailed instructions and operating procedures are provided to all personnel involved in the transfer, packaging and transport of low-level radioactive material (IE Bulletin No. 79-19, Page 2, Item 4) and (2) that SONGS provides training and periodic retraining in the DOT and NRC regulatory requirements and waste burial license requirements, and instructions and operating procedures for all personnel involved in the transfer, packaging and transport of radioactive material (IE Bulletin No. 79-19, Page 2, Item 5). In November 1983 a four day radwaste compliance workshop, with particular emphasis on 10 CFR 61, was given by Chem-Nuclear Systems, Inc. to over 40 SONGS personnel involved with the radwaste management program.

The Quality Assurance Organization at SONGS also conducts inspections of radwaste activities by a qualified inspector who is independent of the activity being performed. Health Physics Procedure SO23-VII-8.5.1, "Process Control Program for San Onofre Units 2 and 3" contains several Quality Hold Points (QHP) in various portions of the procedure which require a QC inspector to be present while they are being performed. Inspections are required to be documented on the Data Record Form for that procedure. Similar QHP's exist in other Health Physics procedures which perform activities falling under the requirements of 10 CFR 71. The Quality Assurance Organization will conduct a surveillance of the initial radwaste shipment performed in 1984 to verify compliance with 10 CFR 61 and revised burial site license criteria.

B. Waste Form

The May 1983 Branch Technical Position on waste form (Reference B) provides guidance to waste generators on test methods and results acceptable to the NRC staff for implementing the 10 CFR 61 waste form requirements. It can be used as an acceptable approach for demonstrating compliance with the 10 CFR 61 waste structural stability criteria. This technical position paper includes guidance on processing waste into an acceptable stable form, designing acceptable high-integrity containers, packaging cartridge filters, and minimizing radiation effects on organic ion-exchange resins.

SONGS has a contract with Chem-Nuclear Systems, Inc. for solidification and transportation services. Chem-Nuclear has provided a mobile cement system to SONGS since November 1981. Station Health Physics Procedures SO123-VIII-8.5, "Radwaste Solidification Procedure" and SO23-VIII-8.5.1, "Process Control Program for San Onofre Unit 2 and Unit 3" address operation of the mobile solidification unit at SONGS 2 and 3. SO23-VII-8.5.1 is consistent with the latest version of the Chem-Nuclear PCP for Mobile Cement Systems (SD-OP-003 Rev. M) and with CNSI Topical Report CNSI-2,4313-01354-OIP, January 1983, Revision 2 (Reference E). Resin solidifications conducted at SONGS 1 with the Chem-Nuclear System

during the period December 1982 through March 1983 have demonstrated that the 10 CFR 61 requirements for Class A waste of a product that is a free standing monolith with no more that 0.5 percent free standing liquid in the waste volume have been met.

SO23-VII-8.5.1 was developed to also be consistent with the requirements in 10 CFR 61 for stabilization of Class B and Class C waste. The formulations incorporated in the worksheets provided in SO23-VII-8.5.1 for sample solidification and full scale solidification for the waste forms present at SONGS are consistent with the latest CNSI solidification formulas used to qualify the CNSI PCP for Class B and Class C waste.

Chem-Nuclear has conducted an extensive testing program to demonstrate compliance with the 10 CFR 61 stability requirements for Class B and Class C waste contained in the Branch Technical Position on Waste Form, May 1983 (Reference B). Their testing program addresses compressive strength, irradiation effects, biodegradation, thermal cycling, immersion effects and leaching. Chem-Nuclear transmitted to SCE on October 27, 1983 (Reference F) a preliminary report with supporting test data for SONGS' waste forms. Chem-Nuclear transmitted to the NRC on November 30, 1983 an addendum to their previously approved Topical Report. This new licensing topical report entitled "CNSI-WF-C-01-NP 10 CFR 61, Waste Form Certification Cement" (Reference G) provides supportive test data to demonstrate compliance with 10 CFR 61 stability requirements for the waste forms present at SONGS. Until final approval of Reference G, SONGS will reference the addendum to demonstrate compliance with the 10 CFR 61 stability requirements contained in Condition 27(m) of the revised State of Washington Radioactive Material License (Reference H). SONGS will dewater spent resin classified as Class A by 10 CFR 61 (specific activity of radionuclides with greater than 5 year half-lives remain below 1 uCi/cc). Dewatering this waste is allowed by condition 27(j) of the latest revision to the state of Washington Radioactive Material License. Station Health Physics Procedure SO23-VII-8.13, "Transferring and Dewatering Spent Resin from T-060 and T-059 for Shipment to Hanford" is being revised to reference Chem-Nuclear's December 23, 1983 submittal of their report CNSI-DW-11118-01, "CNSI Dewatering Control Process Containers Topical Report" (Reference I). This report addresses the certification of both steel liners and High Integrity Containers (HIC) to meet the requirement in Reference (B) to develop and utilize a process control program for dewatering Class A wet solids to ensure that the free liquid requirements in 10 CFR 61 are being met. Should the State of Washington approve a HIC design in the future, then a SONGS procedure containing a process control program to dewater Class B and Class C wet waste will be developed.

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