

Enclosure I

Detailed Responses to the
Marine Review Committee Report
(MRC-79-04)

Radiological Assessment Branch
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

800602055H

Introduction

This document responds to an evaluation of the present radiological environmental monitoring program being done at the San Onofre Nuclear Power Station (SONGS) made by the Marine Review Committee for the California Coastal Commission dated October 9, 1979. The Marine Review Committee's report consists of three sections entitled: (1) A recommendation for independent monitoring of radiological discharges at SONGS; (2) A summary of the Marine Review Committee's evaluation of the present radiological monitoring at SONGS, and (3) A summary of the Marine Review Committee's evaluation of previous studies of the ecological effects of artificial radionuclides on aquatic populations. The three sections are supported by two appendices. Appendix A addresses the evaluation of the SONGS program and Appendix B addresses the previous ecological studies. In this document detailed comments on Sections 1, 2, and 3 are provided along with comments on the appendices where appropriate.

Section 1, first paragraph

In this paragraph the review committee described the SONGS radiological environmental monitoring program as being grossly inadequate. The Committee stated that adequate monitoring can only be assured if it is done by an agency independent of the power companies.

Response 1

It should be clarified that the purpose of the offsite monitoring program is not to determine amounts of radioactive material released from SONGS and the impact this has on the ecology of the nearby areas of the Pacific Ocean. The amounts of radioactivity released are determined from the in-plant radiological effluent monitoring program, and not from the environmental radiological monitoring program. The radiological effluent monitoring program is described in the technical specifications and its results are presented in the operating reports. The purpose of the offsite radiological environmental monitoring program is to provide an indicator for changes in the environment which were not anticipated and which may or may not be due to the plant. The ecological effects due to the routine releases have already been assessed in the Final Environmental Statement (FES) for Unit 1 (1973) and for Units 2 and 3 (1973) and found to be acceptable. The FES's for nuclear plants are prepared in part by scientists of the national laboratories. Only the latest impact assessment methodologies are used. In the FES for Unit 1 calculated internal doses before dilution with sea water to algae, mollusks or crustaceans, fishes, and waterfowl or shore birds are 2500, 140, 13, and 580 millirads per year, respectively. These values represent upper-limit estimates, and were considered to have undetectable ecological effects.

We disagree with the review committee's statement that adequate monitoring can only be done by an agency independent of the power companies. The NRC Office of Inspection and Enforcement periodically audits these programs to assure that they are being conducted according to the technical specification requirements.

Experience with programs with other licensees suggest that the programs are conducted in a conscientious manner.

Section 1, 2nd and 3rd paragraphs

In these paragraphs the review committee discusses the idea of an independent sampling agency in more length. They state that reports should be more clearly and carefully prepared than is done at present and that they should be understandable to any member of the public.

Response 2

From the standpoint of the NRC staff, the monitoring reports are adequately clear for regulatory purposes. However, in an effort to improve these reports the staff is in the process of developing standard specifications along with reporting formats. Input from many groups including the utilities, universities, environmental consultants, the EPA, as well as the NRC staff has been factored into these standard specifications. Many of the ideas expressed in the review committee report have already been considered by these groups and some have been factored into these new specifications.

The reports should not necessarily be designed to be comprehensible to any member of the public. The scientific knowledge, site information, and engineering experience which goes into the development of these programs is

enormous. It would be impossible to make a report fully comprehensible to a member of the public who has little or no scientific training. Duplication of material is generally avoided and background information is only included by reference. It should be mentioned that the site specific reference information such as the licensee's environmental report and the FES, including the actual operating reports, are available to the public in the NRC or local public document room, and are meant to be used in reviewing the reports.

Section 1, pages 2 and 3

In these pages the marine review committee discusses several things that should be considered in developing a better monitoring program. The considerations include who should do the sampling, costs of such a program, and details of the sampling programs such as frequency of sample collection and locations of sample points.

Response 3

There are several problems with the discussion that is presented here. There is no basis for the implication that the marine review committee contractors are more qualified to do the sampling than the licensee and his contractors. It could be argued that the licensee is much more qualified because of his greater familiarity with the plant and the site.

Another problem with this section, which also reflects on other sections, concerns the comment which states that because radioactive discharges are so low from SONGS, the cost of detecting ecological effects from them would be prohibitive. We agree with this statement; most of the effects are

likely not to be measurable regardless of the program. However, the statement does not appear to be consistent with the thrust of the entire report which is to increase sampling efforts, not by a significant amount which would be necessary to even attempt to measure these effects, but by a small amount. Along these same lines, it is not clear what benefit will be had by increasing the sampling by the small amounts described. There is no direct scientific discussion which supports the changes that are proposed. The monitoring programs that will be applied under the standard technical specification which will be implemented at SONGS are the results of input of many groups (see Response 2) and will result in an effective regulatory monitoring program.

The sampling program that is described on page 3 of this report is described as being more appropriate for estimating the amounts of artificial radionuclides in the environment and in organisms due to radiological discharges from SONGS than the existing program. This program incorporates a sampling frequency of four times per year at two localities. Elsewhere in the report the licensee's program was criticized because of an alleged inability to provide an "accurate picture of radionuclides" in the environment in space and time. It is not clear why the Marine Review Committee's program with four samples per year at two localities, which is similar to the licensee's existing program, is going to provide new significant information regarding distribution of radionuclides. The program in the report is not a significant improvement over the existing licensee's program from either the regulatory or scientific standpoint (see Response 1).

Section 2, 1st paragraph

In this paragraph the review committee stated that the radiological environmental sampling program is much too sparse in space and time, that not enough organisms were sampled, and that only if the radioactive material were released evenly over space and time would this program give an accurate picture. They reason that since the radioactivity is likely to be patchy in space and time the program cannot be considered adequate.

Response 4

As suggested in Response 1, the purpose of the radiological environmental monitoring program is not to give an accurate picture of the distribution of radionuclides in space and time that are routinely released from the reactor but to provide an indicator for changes in the environment which were not anticipated and which may or may not be due to the plant. Based on the small quantities of radionuclides that are expected to be released from SONGS it is beyond the state-of-the-art of radiological monitoring to routinely provide such detailed distributions of radionuclides in space and time. Large dilutions occur in the immediate plant environment which vary from hour to hour depending on tides and weather. To thoroughly measure materials in space and time would require measurements at frequencies of hours along with locations spaced at a distance of mixing lengths (several meters). The technical specification program is not designed to give this kind of picture of the amounts and distribution of nuclides that are released routinely. These routine releases have already been analyzed and found to be acceptable in the FES of 1973 for Unit 1 and for Units 2 and 3.

Section 2, 2nd paragraph

In this paragraph the review committee complained that there is no independent audit of the sampling itself, and that the dischargers do all the collections, implying that the licensee might not be totally honest in reporting data.

Response 5

It should be noted here that the NRC Office of Inspection and Enforcement performs periodic audits. In the new technical specifications that are being prepared for San Onofre, the licensee will be required to participate in an inter-laboratory sampling comparison program on a continuing basis. This program is designed to assess the adequacy of the participants sampling results. Also see Response 1.

Section 2, 3rd paragraph

In this paragraph the review committee stated that the licensee's summary reports are incomprehensible in many respects, and that essential information is absent, including dates, precise locations and size of samples, identity of organisms, and parts of animals or plants analyzed.

Response 6

To fully appreciate the reports a close familiarity of the site and previous studies, including the Final Environmental Statement is necessary. It would be unreasonable to require the licensee to include all the background information in every summary report. The approach that is emphasized by NRC regarding

reporting of sampling times and locations is one where consistency is maintained with the objectives of the sampling program. The objective is not to do fundamental ecological research but to detect unanticipated changes and assure that radiation levels are within natural background fluctuations. Since all of the samples taken registered activity levels within background it serves no regulatory purpose to know exactly what day and time of a given month the sample was taken, nor whether the sample was taken 10 feet from the discharge or 100 feet from the discharge. Other things noted such as identity of organisms, and parts of animals could be useful for an academic research project but may not serve a purpose in a regulatory monitoring program. Such information is available if needed from plant records. An important part of the reasoning in designing a broad monitoring approach is the fact that thousands of samples at nuclear stations around the country indicate that since these plants routinely release very little radionuclides into the environment, they contribute no measurable effect over background.

Section 2, 4th paragraph

In this paragraph the review committee stated that the average level of radionuclides were often calculated incorrectly in such a way as to reduce the estimate of what was being released from the plant and that the licensee was not in compliance with NRC requirements.

It was also stated that the committee tried to obtain data sheets from SCE and was unable to get them.

Response 7

The statement regarding the alleged incorrect calculation of average levels of radionuclides is supported by Appendix A, Section V(4) of the Committee report. In this appendix reference is made to an NRC letter to the utilities which describes an acceptable monitoring program and methods of reporting data. It is argued that the licensee did not report data according to the methods described in the letter. While it is true that the utility did not report data in accordance with NRC specifications in the referenced letter, it was not a violation because the letter was intended to inform the licensees of the direction the staff was going regarding these programs and to solicit their comments. The letter was not a requirement on the licensee and, therefore, the licensee was not in violation of their technical specifications.

The review committee also stated that the licensee's method for computing sample averages, which was to include zeros for values below the minimum detectable level, violated common sense. This is an arguable point. The measurements which are below the minimum detectable level should be considered in determining the representative value. Exactly how they are handled depends on the preference of the investigator. What is more important is that they are handled in a consistent fashion from one year to the next so that comparisons can be made over time. One of the objectives of the standard technical specification program is to assure consistency both over time and from one plant to the next.

It should also be noted that the licensee did not receive the first information letter until after April 11, 1978. The Review Committee cited the 1977 and 1978 licensee reports as not being in compliance with NRC regulations. By the time the licensee received the letter the 1977 report was already published and data had been collected and possibly analyzed for the 1978 report.

Regarding the review committee's implication that SCE was not cooperative in releasing data, the NRC staff could obtain the data for the review committee from the licensee provided adequate justification was provided. The NRC staff is not privy to the reasons why SCE management does or does not respond to requests such as this one.

Section 2, 5th paragraph

This paragraph summarizes Section 2 by concluding that because of the inadequacy of the monitoring program it is impossible to determine the amounts of radioactive material being released by SONGS.

Response 8

As noted above, the purpose of the radiological environmental monitoring program is not to determine the amounts of the radioactive material being released by SONGS. The purpose of the program is to supplement the radiological effluent monitoring by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the modeling of the environmental exposure pathway, while taking into consideration the minimum detectable sampling levels and the natural background levels.

Section 3

This section discusses four ecological studies where radioactive materials were released. These studies were not for nuclear power plants but for facilities where radioactive materials were released in much greater quantity than that which is normally released from nuclear power plants.

Response 9

It is not clear what the purpose of this section and the supportive material in Appendix B is. As stated in responses above, the radiological environmental monitoring program is not designed to be a fundamental research ecology study. The last sentence of this section states that "until good (ecological) studies are published, the ecological effects, if any, of radiological discharges from nuclear power plants cannot be judged". This statement is not true. In every nuclear plant environmental statement that is published a judgment is made regarding the effects of radiological discharges on the site environs. These judgments are made by highly qualified professionals, often under oath and rigorous cross-examination in the legal forum. These judgments generally have to be made keeping a perspective of other factors, including natural factors, which have an effect on the ecology. Considerations are given to the amount of radioactivity that is planned to be released, the degree of dispersion that occurs in the environment, the species that are involved, and many other factors which play a role in assessing the impact. The resultant impact estimates are weighed against those that occur because of natural causes and other man-made causes and a judgment is made of their acceptability. In this

manner it is not necessary to know all the fine details of the ecological effects in order to make a judgment as to whether a plant should or should not be licensed. Because of the enormous cost that would be required to study these details it is not considered to be in the public's best interest to do them routinely at nuclear plants. NRC's research division has authority to initiate contracts in this area and some work has been and is presently being done. A copy of the Review Committee's report is being forwarded to the research contract group at NRC to be sure that they have an opportunity to consider the Committee's comments.