

reported for the site and surrounding area, the combinations of the effects of normal and accident conditions with the effects of the natural phenomena, and the importance of the safety functions to be performed. Appendix A to 10 CFR part 100, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," Section III(C), requires that the nuclear power plant's design bases for earthquakes be determined through evaluation of the geologic and seismic history of the nuclear power plant site and surrounding region. The purpose of this determination is to estimate the magnitude of the strongest earthquake that might affect the site of a nuclear power plant during its operating lifetime. The earthquake postulated for the seismic design of a plant, called the Safe Shutdown Earthquake (SSE), defines the maximum ground motion for which certain nuclear power plant structures, systems and components necessary for safe operation and shutdown are designed to remain functional (e.g., for decay heat removal after the reactor is shutdown).

The San Onofre Nuclear Generating Station (SONGS) site had undergone geologic and seismic investigations and reviews prior to issuance of the construction permits including surveys performed by the applicant, the United States Geological Survey, the California Division of Mines and Geology, and the National Oceanic and Atmospheric Administration. The findings of these investigations were reviewed extensively by the staff and were litigated extensively in proceedings concerning the issuance of the construction permits¹ and operating licenses² for SONGS Units 2 and 3.

The Petitioner asserts that SONGS is vulnerable to a deep ocean quake. There are a number of offshore faults in the coastal waters off of Southern California. Of greatest concern to the San Onofre site is an offshore structure beginning with the Newport-Inglewood Zone of Deformation near Long Beach, passing the site about 8 kilometers offshore and extending south to the San Diego area as the Rose Canyon Fault

Zone.³ This entire structure is known as the Offshore Zone of Deformation (OZD).⁴ The Atomic Safety and Licensing Board determined, during the 1982 operating license proceeding, that, based on historic earthquake data, the distinctive geology of the area, and prevailing stresses in the earth's crust, the controlling feature for San Onofre is the OZD.⁵

The Petitioner asserts that SONGS is vulnerable to a magnitude 8 or greater earthquake on the Newport-Inglewood Fault. The largest earthquake known to have occurred on that fault is the 1933 Long Beach earthquake which was a magnitude 6.3.⁶ Testimony presented during the operating license proceeding concluded that the features of the OZD, its geologic strain rate, regional tectonic setting, and absence of extensive and/or through-going fault rupture in near-surface strata along much of the OZD, all support earthquakes of less than about a magnitude 7.⁷ In addition, the NRC staff concluded, based on an evaluation of historical seismicity of the OZD and an evaluation of the fault parameters, that a maximum magnitude of 7.0 is based upon a reasonable and conservative interpretation of all available geological and seismological information.⁸ The Atomic Safety and Licensing Board⁹ as well as the Atomic Safety and Licensing Appeal Board¹⁰ concluded that a magnitude 7 earthquake on the OZD is appropriately conservative.¹¹ The Petitioner has not provided any basis to support the likelihood of magnitude 8 or greater earthquake on the Newport-Inglewood Fault or call into question the conclusion of the Atomic Safety and

Licensing Board and the Atomic Safety and Licensing Appeal Board.

The Petitioner expresses concern that panic caused by an earthquake could result in a meltdown due to human error. The ability of a nuclear power plant to resist the forces generated by the ground motion during an earthquake is incorporated in the design and construction of the plant. Industry codes and practices that govern the design and construction of nuclear power plant structures and components are far more stringent than those used for residential and commercial buildings. As a result, nuclear power plants are able to resist earthquake ground motions well beyond their design bases and well beyond the ground motion that would result in damage to commercial buildings.

As a safety requirement, nuclear power plants have strong ground motion seismic instruments in and near the sites. If the ground motion at a site exceeds a specified level, which is one-half or less of the Safe Shutdown Earthquake, the plant is required to shut down (10 CFR 100, Appendix A, V, (a)(2)). As a defense-in-depth design feature, SONGS has a automatic seismic scram system to shut down the reactors when the ground motion exceeds a conservatively selected threshold value.¹² Prior to resuming operations following plant shutdown as the result of an earthquake, the licensee is required to demonstrate to the Commission that no functional damage has occurred to those plant features necessary for continued safe operation. In summary, based on exhaustive seismic and geologic investigations performed for the SONGS site, which has been subjected to extensive litigation, the seismic design basis for the plant is reasonably conservative.

The Petitioner has failed to provide an adequate basis for his concern regarding the seismic adequacy of SONGS and, accordingly, has not raised any substantial health or safety issue that would call into question the safe operation of SONGS.

B. Threat of Vehicle Bombs

The Petitioner asserts that SONGS is not defensible from terrorists. The Petitioner bases this assertion on a newspaper article (*Los Angeles Times*, August 4, 1994) concerning the threat of vehicle bombs at nuclear plants and the Commission's recent rule requiring nuclear plants to install anti-terrorist barriers within 18 months.

¹² NUREG-0741, "Technical Specifications San Onofre Nuclear Generating Station Unit 2," Table 3.3.1 February 1982; and NUREG-0952, "Technical Specifications San Onofre Nuclear Generating Station Unit 3," Table 3.3.1, November 1982.

³ See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-3, 15 NRC 61, at 68 (1982).

⁴ *Id.*

⁵ *Id.*, at 69.

⁶ *Id.*, at 104.

⁷ *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-673, 15 NRC 688, 709 n. 40 (1982).

⁸ NUREG-0712, "Safety Evaluation Report Related to the Operation of San Onofre Nuclear Generating Station, Units 2 and 3," Section 2.5.2.3.4, February 1981.

⁹ See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-3, 15 NRC 61, at 86 (1982).

¹⁰ *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-717, 17 NRC 346, 364-65 (1983).

¹¹ The Petitioner also provided a scenario of the effects on the Los Angeles area of a magnitude 6 earthquake on the Newport-Inglewood Fault followed by a magnitude 8 earthquake. The Petitioner has failed to provide any basis to support this scenario. The staff reviewed this scenario and determined that, based on the investigations and reviews discussed above, it has no basis in scientific theory or physical possibility.

¹ See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-73-36, 6 AEC 929 (1973), and ALAB-248, 8 AEC 957 (1974).

² See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-3, 15 NRC 61 (1982); ALAB-673, 15 NRC 688 (1982); ALAB-717, 17 NRC 346 (1983); and see *Carstens v NRC*, 742 F.2d 1546 (D.C. Cir. 1984), cert denied 471 U.S. 1136 (1985) (the Court of Appeals affirmed the Commission's granting of the operating licenses for SONGS Units 2 and 3, noting the voluminous record and substantial evidence supporting the seismic review).