

SAN ONOFRE UNIT 1

San Clemente, CA

Owner: Southern California Company

Outage dates (duration): February 26, 1982 to November 28, 1984 (2.8 years)

Reactor type: Pressurized water reactor

Reactor age when outage began: 14.2 years

Commercial operations began: January 1, 1968

Fleet status: Oldest of three reactors owned by the company

Synopsis

On May 3, 1976, the NRC initiated its Systematic Evaluation Program (SEP) with the objectives of evaluating licensed nuclear power reactors against current safety criteria and developing a process for determining when backfits are necessary to ensure these reactors pose no undue risk to public health.¹ The SEP applied to San Onofre Unit 1 noted the fact that current safety criteria called for reactors to be designed to withstand earthquakes with 0.67 g ground acceleration, but Unit 1 was only designed to withstand 0.5 g.

In April 1980, Southern California Edison (SCE) provided the NRC with its reasons for considering Unit 1 safe to operate while the seismic issues were being resolved, which initiated a series of questions from the NRC about the seismic re-analysis program. In July 1981, consumer advocate Ralph Nader petitioned the NRC to shut down Unit 1 because it did not meet contemporary seismic criteria, but the agency denied this petition in November.

SCE brought Unit 1 down in February 1982 for a refueling and maintenance outage scheduled to last until June. In April, the company presented the NRC with the results of its re-analysis program, which showed that vital equipment could potentially fail due to high stress from 0.67 g ground motion. The NRC asked whether these results suggested that Unit 1 might not meet its 0.5 g design basis, but rather than providing the information that would show Unit 1 was adequately designed, SCE committed in June to upgrade Unit 1 to satisfy the 0.67 g criterion. The NRC subsequently issued a confirmatory order on August 11 requiring Unit 1 to remain shut down until it was upgraded.

In early 1984, the California Public Utilities Commission ruled that Unit 1 would be subjected to adverse rate treatment if it was not returned to service that year. SCE lobbied the NRC to allow Unit 1 to restart even though the terms and conditions of the agency's August 11, 1982, order had not been satisfied, and the commissioners—using a process that their own general counsel advised would probably not be upheld in court if challenged—allowed SCE to restart Unit 1 in November 1984.

Process Changes

No direct changes were identified.

Commentary

The NRC's regulatory performance in this case resembled an old comedy routine:

- The agency's SEP identified the fact that Unit 1 did not meet current seismic criteria—that's good.
- But the NRC allowed Unit 1 to continue operating for years anyway—that's bad.
- But this led SCE to voluntarily upgrade Unit 1 to the current seismic criteria—that's good.
- But the company retreated from its promise for economic reasons and the NRC didn't stand in the way—that's bad. About as bad as it gets.

It is difficult to understand the NRC's rationale. In 1980, SCE was allowed to continue operating Unit 1 even though the agency knew the reactor did not meet the 0.67 g criterion, but *thought* it met the 0.5 g criterion. In 1982, SCE was *not* allowed to continue operating Unit 1 when the NRC thought the reactor might also fail to meet the 0.5 g criterion. In 1984, SCE was allowed to restart Unit 1 when the NRC knew the reactor still did not meet the 0.67 g criterion and now knew for a fact that it did not meet the 0.5 g criterion either.

If the NRC was right in 1982 that Unit 1 was not safe to operate, then it was probably wrong in 1980 and 1984 when it did allow Unit 1 to operate. If the agency was right in 1980 and 1984, then it was probably wrong in 1982. It is impossible to argue that the NRC was right in 1980, 1982, *and* 1984.

NRC Systematic Assessment of Licensee Performance (SALP) History

Date	Operations	Radiological Controls	Maintenance	Surveillance Testing	Emergency Preparedness	Fire Protection	Security	Outage Management	Quality Assurance	Licensing	Training
9/1/1981	2	3	3	1	1	2	3	1	2	n/a	n/a
12/1/1982	2	2	2	2	1	2	2	1	2	2	n/a
11/1/1984	3	3	2	2	1	2	2	2	n/a	2	n/a
8/1/1986	2	1	2	2	2	1	2	1	2	2	2
1/1/1988	1	2	2	2	1	2	2	1	2	2	1
	Operations	Radiological Controls	Maintenance/Surveillance Testing	Emergency Preparedness		Security	Engineering and Technology		Safety Assessment and Quality Verification		
1/1/1989	1	1	2	1		1	3		3		
5/1/1990	2	1	1	1		1	2		2		

NOTE: A rating of 1 designates a superior level of performance where NRC attention may be reduced. A 2 rating designates a good level of performance with NRC attention at normal levels. A rating of 3 designates an acceptable level of performance where increased NRC attention may be appropriate. A rating of n/a was given in those areas that were not assessed on that date.

Details

April 28, 1980: SCE submitted its argument for continuing to operate Unit 1 while seismic issues raised during the NRC's SEP were being resolved. The SEP had identified that Unit 1 was designed to lower earthquake safety standards than those currently accepted.²

August 4, 1980: The NRC asked SCE for additional information about its plans to re-evaluate the plant in terms of its ability to withstand earthquakes.³

September 24, 1980: SCE provided the NRC with details about what portions of Unit 1 were being re-evaluated and the criteria being applied.⁴

February 23, 1981: SCE supplemented its September 24 response to the NRC with additional details.⁵

April 24, 1981: The NRC asked SCE for more information about its seismic re-evaluation program.⁶

July 7, 1981: SCE provided the NRC with additional details about what portions of Unit 1 were being re-evaluated and the criteria being applied.⁷

July 10, 1981: Ralph Nader submitted a 2.206 petition to the NRC seeking the suspension or revocation of the Unit 1 operating license because the reactor did not meet current safety standards.⁸

August 11, 1981: SCE supplemented its July 7 response to the NRC with additional details about what portions of Unit 1 were being re-evaluated and the criteria being applied.⁹

September 28, 1981: SCE again supplemented its July 7 response to the NRC with additional details.¹⁰

October 5, 1981: SCE again supplemented its July 7 response to the NRC with additional details.¹¹

October 19, 1981: SCE again supplemented its July 7 response to the NRC with additional details.¹²

November 16, 1981: The NRC issued its safety evaluation report on the interim operation of Unit 1 (i.e., until the seismic re-evaluation program and its associated modifications could be completed).¹³

November 16, 1981: The NRC denied the 2.206 petition submitted by Ralph Nader.¹⁴

February 26, 1982: Unit 1 was shut down for a refueling and maintenance outage planned to last until June 1982.¹⁵

April 30, 1982: SCE submitted to the NRC results from its seismic re-evaluation of Unit 1 at 0.67 g (as opposed to the original analysis performed at 0.5 g), which showed high stress for some safety equipment.¹⁶

May 20, 1982: The NRC met with SCE to discuss whether the re-evaluation results for Unit 1 at 0.67 g meant that the reactor did not meet its original design basis.¹⁷

June 15, 1982: SCE committed to upgrading Unit 1 for a 0.67 g earthquake.¹⁸

August 11, 1982: The NRC issued a Confirmatory Order requiring Unit 1 to remain shut down until the seismic upgrades for a 0.67 g earthquake could be completed.¹⁹

August 11, 1982: The NRC informed Ralph Nader that it had ordered SCE to keep Unit 1 shut down until the seismic upgrades could be completed.²⁰

August 11, 1982: The NRC informed approximately 1,560 California residents who had petitioned the agency to revoke the Unit 1 operating license that it had ordered SCE to keep the reactor shut down until the seismic upgrades could be completed.²¹

May 20, 1983: SCE committed to upgrade the environmental qualification of electrical equipment at Unit 1 in response to NRC's issuance of 10 CFR 450.49(g).²²

December 9, 1983: The NRC met with SCE to discuss an alternative to the company's seismic upgrade plan, which would immediately upgrade to 0.67 g those components necessary for preventing and mitigating accidents but allow other components to be upgraded later.²³

December 14, 1983: The NRC met with SCE again.²⁴

December 22, 1983: SCE submitted a revised seismic upgrade plan that called for upgrading some equipment before restart and the remainder after restart.²⁵

January 31, 1984: The California Public Utility Commission contacted the NRC about the agency's position on the SCE restart schedule.²⁶

February 8, 1984: The NRC agreed to SCE's request to divide the seismic upgrade plan into portions to be done prior to restart and portions to be done later.²⁷

July 30, 1984: SCE filed a request with the NRC for an extension of the March 31, 1985, deadline in 10 CFR 50.49(g) for upgrading the environmental qualification of electrical equipment on Unit 1.²⁸

November 5, 1984: NRC General Counsel Martin Malsch informed the agency's chairman and commissioners that it was his office's "intuitive gut feeling" that the courts would consider the NRC's August 11, 1982, Confirmatory Order a license amendment, but cautioned that SCE would never have agreed to the order had they known it would later be viewed as an amendment.²⁹

November 7, 1984: SCE representatives called NRC Chairman Nunzio Palladino with details of the California Public Utilities Commission (PUC) order that imposed financial hardships on the company if Unit 1 did not restart before the end of 1984.³⁰

November 8, 1984: SCE President Howard Allen called NRC Chairman Palladino to convey, repeatedly, the schedule pressure facing SCE to restart Unit 1 immediately.³¹

November 8, 1984: NRC Commissioner Thomas Roberts issued a memo to his colleagues outlining the financial hardships SCE would face if Unit 1 failed to restart before the end of 1984. Roberts noted that all of the provisions of the agency's August 1982 order had not, and would not, be met.³²

November 15, 1984: NRC staff responded to Chairman Palladino's inquiry by reporting that the California PUC order required Unit 1 to run either at or above 90 percent power beginning on December 23, 1984, or at or above 65 percent power beginning on December 2.³³

November 16, 1984: Department of Energy Secretary Donald Paul Hodel urged NRC Chairman Palladino to reconsider the agency's Confirmatory Order in a manner that would allow Unit 1 to restart quickly.³⁴

November 21, 1984: NRC staff briefed the commissioners on the status of the seismic upgrade program for Unit 1. All structures except for the south extension of the turbine building had been upgraded to 0.67 g and components needed to achieve hot standby following an earthquake had also been upgraded to 0.67 g. Critical portions of accident-mitigating systems piping and components had *not* been upgraded to 0.67 g, but had been re-evaluated for 0.5 g.³⁵ NRC Director of the Office of Nuclear Reactor Regulation Harold Denton expressed his conclusion that operating Unit 1 for one more cycle until the upgrades to 0.67 g could be completed would not unduly threaten public health and safety.³⁶

November 21, 1984: NRC commissioners voted to treat the August 11, 1982, Confirmatory Order as an enforcement action rather than an amendment to the operating license. Their decision was based on the fact that SCE volunteered to upgrade Unit 1 to the 0.67 g criteria rather than submit the technical data that would show the unit met the original 0.5 g criteria, so that “no provision of the license itself was modified” by the Confirmatory Order.³⁷

November 21, 1984: NRC Commissioner James Asselstine disagreed with the majority of his colleagues:

“I do not support the Commission decision to allow San Onofre 1 to return to service at this time. I am in essential agreement with the points raised in the November 5, 1984 Memorandum from the Office of the General Counsel regarding San Onofre 1 restart. Specifically, I believe that the changes to the operation and design of the plant that were included in NRC’s confirmatory order of August 11, 1982 were so substantial that they must be considered an amendment to the license. Therefore, the subsequent order relaxing those changes must also be considered a license amendment. In addition, I am troubled by the Commission’s reliance on the economic impact on the licensee of the California Public Utilities Commission’s ruling as the basis for relaxing the safety requirements called for by the August 1982 confirmatory order. I believe that in the context of this case, reliance on such economic impacts to relax safety requirements is inappropriate.”³⁸

November 21, 1984: The NRC issued a Contingent Rescission of Suspension to SCE that allowed Unit 1 to restart despite not having fulfilled all conditions of the August 11, 1982, order.³⁹

November 26, 1984: The NRC extended the deadline to upgrade environmental qualification of electrical equipment to November 30, 1986.⁴⁰

November 27, 1984: NRC staffer Christopher Grimes informed the Advisory Committee on Reactor Safeguards that the two systems having “no appreciable margin at 0.5g” are the refueling water storage tank (the source of water for the auxiliary feedwater system) and cast-iron piping.⁴¹

November 28, 1984: Unit 1 was connected to the electrical grid, ending an extended outage that included some \$150 million (\$287 million in 2006 dollars⁴²) in seismic upgrades.⁴³

November 30, 1984: SCE informed the NRC that requirements contained in the agency’s November 21 order allowing Unit 1 to restart needed “further clarification,” and that the company would submit the clarifying information in the future.⁴⁴

Notes

- ¹ Nuclear Regulatory Commission. 1976. *Task force report on the systematic evaluation of operating nuclear power plants*. November. Washington, DC.
- ² Crutchfield, D.M. 1982. Commitments on seismic upgrading. Letter to R. Dietch, Southern California Edison Company, August 11. Dennis M. Crutchfield was a Nuclear Regulatory Commission employee.
- ³ Ibid.
- ⁴ Ibid.
- ⁵ Ibid.
- ⁶ Ibid.
- ⁷ Ibid.
- ⁸ Ibid.
- ⁹ Ibid.
- ¹⁰ Ibid.
- ¹¹ Ibid.
- ¹² Ibid.
- ¹³ Ibid.
- ¹⁴ Ibid.
- ¹⁵ *Nuclear News*. 1982. Outage notes, April.
- ¹⁶ Crutchfield, 1982.
- ¹⁷ Ibid.
- ¹⁸ Ibid.
- ¹⁹ Ibid.
- ²⁰ Ibid.
- ²¹ Ibid.
- ²² Denton, H.R. 1984a. Environmental qualification of electric equipment important to safety—extension of deadline. Letter to Kenneth P. Baskin, Southern California Edison Company, November 26. Harold R. Denton was a Nuclear Regulatory Commission employee.
- ²³ Denton, H.R. 1984b. Proposed restart plan for San Onofre Nuclear Generating Station, Unit No. 1. Letter to Kenneth P. Baskin, Southern California Edison Company, February 8. Harold R. Denton was a Nuclear Regulatory Commission employee.
- ²⁴ Ibid.
- ²⁵ Ibid.
- ²⁶ Crutchfield, D.M. 1984. Telecon from California Public Utilities Commission staff member. Memorandum to Eileen McKenna, project manager, Nuclear Regulatory Commission, February 1. Dennis M. Crutchfield was a Nuclear Regulatory Commission employee.
- ²⁷ Denton, 1984b.
- ²⁸ Denton, 1984a.
- ²⁹ Hudgins, C. 1984. San Onofre-1 restarts after cautious legal and staff recommendation. *Inside NRC*, December 10.
- ³⁰ Palladino, N.J. 1984. San Onofre Unit 1 restart. Memorandum to Commissioners Roberts, Asselstine, Bernthal, and Zech, Nuclear Regulatory Commission, November 7. Nunzio J. Palladino was chairman of the Nuclear Regulatory Commission.

- ³¹ Palladino, N.J. 1984. San Onofre Unit 1. Memorandum to Commissioners Roberts, Asselstine, Bernthal, and Zech, Nuclear Regulatory Commission, November 15. Nunzio J. Palladino was chairman of the Nuclear Regulatory Commission.
- ³² Roberts, T. 1984. Proposal for restart of San Onofre 1. Memorandum to Chairman Palladino and Commissioners Asselstine, Bernthal, and Zech, Nuclear Regulatory Commission, November 8. Thomas Roberts was a commissioner at the Nuclear Regulatory Commission.
- ³³ Dircks, W.J. 1984. Decision regarding restart of San Onofre Nuclear Generating Station, Unit 1. Memorandum to Nunzio J. Palladino, chairman, Nuclear Regulatory Commission, November 15. William J. Dircks was executive director for operations at the Nuclear Regulatory Commission.
- ³⁴ Hodel, D.P. 1984. Letter to Nunzio J. Palladino, chairman, Nuclear Regulatory Commission, November 16. Donald Paul Hodel was secretary of the Department of Energy.
- ³⁵ Dircks, W.J. 1984. San Onofre full power license. Memorandum to Nunzio J. Palladino, chairman, Nuclear Regulatory Commission, November 19. William J. Dircks was executive director for operations at the Nuclear Regulatory Commission.
- ³⁶ Hudgins, 1984.
- ³⁷ Hoyle, J.C. 1984. SECY-84-434—Options for San Onofre 1. Memorandum to William J. Dircks, executive director for operations, November 21. John C. Hoyle was acting secretary at the Nuclear Regulatory Commission.
- ³⁸ Austin, J.H. 1984. SECY-84-434—Options for San Onofre 1. Memorandum to Samuel J. Chilk, secretary, Nuclear Regulatory Commission, November 28. John H. Austin was a Nuclear Regulatory Commission employee.
- ³⁹ Eisenhut, D.G. 1984. Letter to Kenneth P. Baskin, vice president, nuclear engineering safety and licensing department, Southern California Edison Company, November 21. Darrell G. Eisenhut was director of licensing at the Nuclear Regulatory Commission.
- ⁴⁰ Denton, 1984a.
- ⁴¹ Hudgins, 1984.
- ⁴² Bureau of Labor Statistics. 2006. Inflation calculator. Washington, DC: U.S. Department of Labor. Online at <http://data.bls.gov/cgi-bin/cpicalc.pl>.
- ⁴³ Hudgins, 1984.
- ⁴⁴ Baskin, K.P. 1984. Letter to Darrell G. Eisenhut, director of licensing, Nuclear Regulatory Commission, November 30. Kenneth P. Baskin was vice president of the Southern California Edison Company.