

# Summary of threats posed by the San Onofre nuclear reactors

Friends of the Earth is airing a [TV ad in southern California](#) the week of April 2, 2012 in cooperation with organizations in Orange County concerned about the dangers of the nuclear reactors at San Onofre. Because of serious, unresolved safety problems, the reactors at San Onofre have been closed since the end of January, and the groups are working to ensure the safety of the millions of people in southern California is protected from the risks of an accident. The reactors' operator, Southern California Edison, must fully disclose the scale of damage to the steam generators at the reactor site, and conduct a root cause analysis of the problems. Keeping the San Onofre reactors closed down is the only way to significantly reduce the risk of an accident and further release of radiation from the damaged reactors.

As the people of Japan tragically discovered one year ago, nuclear reactors can go terribly wrong — which is one reason why 49 out of 50 nuclear reactors are currently shut down in Japan, while the threats continue at the Fukushima plant.<sup>1</sup>

## Summary of why we are concerned about the San Onofre reactors.

The following provides a deeper explanation of the problems cited in the TV ad.

**“A nuclear crisis”** – The San Onofre nuclear plant has been closed for two months following a ruptured tube that led to the shut down of reactor Unit 3.<sup>2</sup> This was followed by the discovery of rapidly degrading steel tubes in four steam generators inside both reactors at the site.<sup>3</sup> This discovery prompted intervention from the Nuclear Regulatory Commission.<sup>4</sup> A report by nuclear engineer Arnie Gunderson and Fairewinds Associates, and commissioned by Friends of the Earth, concluded that substantial changes in the design of the steam generators could have contributed to the severe wear in steel tubes that had only been in operation for less than two years in Unit 2 and for 11 months in the case of Unit 3.<sup>5</sup>

**“A defective tube ruptures – leaking radiation”** – On January 31 a tube ruptured in San Onofre's reactor Unit 3. Southern California Edison subsequently revealed that an inspection of the two steam generators in Unit 2 showed unusually rapid wear in hundreds of steel tubes within the steam generators. The leak in Unit 3, which released radiation into the environment, was the first clear evidence that the Mitsubishi steam generators — in operation from April 2010 in Unit 2 and February 2011 in Unit 3 — were in a degraded state.

Edison initially denied any leak of radiation into the atmosphere.<sup>6</sup> Then an NRC official stated that a small release had occurred and, because the containment into which it leaked was not air tight, a small amount may have entered the environment.<sup>7</sup> Edison subsequently confirmed a small release to the environment.<sup>8</sup>

The risk of more serious tube failures leading to a major release of radioactivity and damage to the cooling system of the reactors makes this a nuclear crisis.<sup>9</sup>

1 See, <http://www.nytimes.com/2012/03/30/world/asia/japan-admits-nuclear-plant-still-poses-dangers.html>

2 <http://abcnews.go.com/blogs/headlines/2012/02/san-onofre-nuclear-plant-closed-after-radiation-leak/>

3 See, <http://www.nrc.gov/reading-rm/doc-collections/news/2012/12-011.iv.pdf>

4 See, <http://www.nrc.gov/reading-rm/doc-collections/news/2012/12-011.iv.pdf>

5 See, <http://www.foe.org/news/blog/2012-03-nuclear-engineer-warns-san-onofre>

6 See, San Onofre Nuclear Generating Station Operators Perform Precautionary Shutdown of Reactor Unit, ROSEMEAD, Calif., Jan. 31, 2012, <http://www.songscommunity.com/news.asp>

7 See, <http://www.nbclosangeles.com/news/local/San-Onofre-Small-Radiation-Leak-138502519.html>

8 See, SCE Responds to Initial NRC Report About Unit 3 Shutdown, Posted February 17, 2012 - 5:45 p.m. PDT, <http://www.songscommunity.com/news.asp>

9 Ibid.



**“Causing an emergency reactor shut down”** – The tube that ruptured on January 31 led to a rapid shut down of the Unit 3 reactor – and a manual SCRAM — defined by the NRC as, “The sudden shutting down of a [nuclear reactor](#), usually by rapid insertion of [control rods](#), either automatically or manually by the reactor operator. Also known as a ‘reactor trip.’”<sup>10</sup> The leak and discovery of severely damaged tubes led to intervention by the NRC.<sup>11</sup>

**“It’s not Fukushima, Japan — it’s the San Onofre nuclear reactor site”** – Ongoing safety problems and underlying vulnerabilities put San Onofre at risk of a catastrophic disaster. While the degraded steam generators are the current issue of concern, there are also major seismic risks at the site.<sup>12</sup> San Onofre is host to more than 1,400 tons of highly radioactive spent fuel.<sup>13</sup> Like at Fukushima, at San Onofre the majority of this radioactive spent fuel is held in pools that are highly vulnerable in the event of a loss of power to the site.<sup>14</sup>

**“Near the homes of 8 million people”** – According to 2010 population data, 8.46 million people live within a 50 mile radius of San Onofre.<sup>15</sup> The population density of Orange County, in which San Onofre is located, is more than 3,400 people per square mile<sup>16</sup> — compared with 400 people per square mile in Fukushima Prefecture where the Fukushima-daiichi reactors are located. More than one year after the start of the disaster in Japan, more than 100,000 people remain evacuated from the towns and communities around the site, with high levels of radiation above safety limits in Fukushima City, forty miles from the reactor site.<sup>17</sup>

The implications are clear. There are major doubts about the ability to evacuate even a fraction of the population living within 50 miles of the reactors in the event of a major accident at San Onofre. The principal route between San Diego and Los Angeles, Interstate-5, lies less than one mile from the nuclear reactor site.

**“So why is Southern California Edison trying to reopen the plant”** – Edison has continued to reiterate its aim to restart the reactors as investigations into the damage to the reactors’ steam generators continues. In response to the NRC intervention on March 27, Ron Litzinger, vice president of Southern California Edison, said, “*We welcome the NRC’s letter, which is a formal step in the process of restarting Units 2 and 3.*”<sup>18</sup> Edison appears to downplay the significance of the NRC intervention. Since the shutdown, Edison has taken moves to prepare for the restart of Unit 2 – it has refuelled the reactor and completed general maintenance. Before the intervention of the NRC on March 27, Edison’s actions indicated that it was seeking to open Unit 2 within weeks, despite major, unresolved safety issues at both reactors.

**“Covering up evidence of more reactor defects”** – San Onofre has the highest number of safety complaints from workers of any reactor site in the entire United States.<sup>19</sup> In 2010 the NRC further reported that, “officials said the plant was getting nearly 10 times as many complaints than an average nuclear facility.”<sup>20</sup>

10 <http://www.nrc.gov/reading-rm/basic-ref/glossary/scram.html>

11 See, <http://www.nrc.gov/reading-rm/doc-collections/news/2012/12-011.iv.pdf>

12 See for example, “There is credible reason to believe that the design basis earthquake approved by NRC at the time of the licensing of SONGS 2 and 3 ... may underestimate the seismic risk at the site.” <http://www.energy.ca.gov/2008publications/CEC-100-2008-005/CEC-100-2008-005-F.PDF>

13 See, Spent Nuclear Fuel Pools in the US: Reducing the deadly risk of storage, Robert Alvarez, May 2011, Institute for Policy Studies, [http://www.ipsdc.org/reports/spent\\_nuclear\\_fuel\\_pools\\_in\\_the\\_us\\_reducing\\_the\\_deadly\\_risks\\_of\\_storage](http://www.ipsdc.org/reports/spent_nuclear_fuel_pools_in_the_us_reducing_the_deadly_risks_of_storage)

14 *Ibid.*

15 See, [http://www.msnbc.msn.com/id/42555888/ns/us\\_news-life/t/nuclear-neighbors-population-rises-near-us-reactors/#.T3fC-NJhQQ20](http://www.msnbc.msn.com/id/42555888/ns/us_news-life/t/nuclear-neighbors-population-rises-near-us-reactors/#.T3fC-NJhQQ20)

16 See, <http://www.city-data.com/city/San-Clemente-California.html>

17 See, <http://www.foe.org/news/blog/2012-03-fukushima-one-year-later>

18 See, Southern California Edison Welcomes Nuclear Regulatory Commission Letter Outlining Next Steps for San Onofre Nuclear Generating Station NRC Sends Plant a Confirmatory Action Letter, <http://www.songscommunity.com/news.asp>

19 See, <http://sanonofresafety.files.wordpress.com/2011/11/allegationsall-2pages.pdf>

20 See, NRC report - <http://pbadupws.nrc.gov/docs/ML1126/ML11269A153.pdf>



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Edison has failed to conduct thorough inspections of the tubes in Unit 2. Specifically, the NRC disclosed in its March 27 letter to Edison that the company had to date only pressure tested one tube out of a total of 19,454 tubes in the two steam generators in reactor Unit 2.<sup>21</sup>

The nuclear engineer's report commissioned by Friends of the Earth warned that a robust and comprehensive inspection and analysis is needed to uncover the scale of severe tube damage in the steam generators. Without a full and robust inspection, Edison would risk a severe accident and major release of radiation by restarting the reactors.<sup>22</sup>

**“Profits?”** – The shutdown is reportedly costing Edison \$1 million each day in lost electricity sales.<sup>23</sup> Yet the cost of replacing San Onofre's steam generators was footed by California ratepayers. In 2005, the California Public Utility Commission agreed that electricity users would pay for the replacement of the steam generators when Edison requested hundreds of millions of dollars. The cost of the steam generator replacement program was \$680 million.<sup>24</sup> Now, less than two years after they began operating, these new generators are severely degraded — a poor return for the millions of dollars invested by the public.

For all these reasons and more, Friends of the Earth is calling for the San Onofre reactors to remain shut down.

The TV ad can be found at <http://www.foe.org/news/blog/2012-04-new-television-ad-highlights-san-onofre-reactor-problems>.

The TV ad was paid for by Friends of the Earth. It was endorsed by the Citizens Oversight Projects, Committee to Bridge the Gap, Physicians for Social Responsibility – Los Angeles, Residents Organized for a Safe Environment (ROSE), San Clemente Green, SanOnofreSafety.org, and the Peace Resource Center of San Diego.

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21 See, NRC to Peter Dietrich, Senior Vice President, Southern California Edison March 27th, 2012, <http://www.nrc.gov/reading-rm/doc-collections/news/2012/12-011.iv.pdf>

22 See, See, <http://www.foe.org/news/blog/2012-03-nuclear-engineer-warns-san-onofre>

23 See, <http://www.kpbs.org/news/2012/feb/02/san-onofre-shutdown-costing-1-million-day/>

24 See, [http://docs.cpuc.ca.gov/published/Final\\_decision/52271-06.htm#P145\\_16910](http://docs.cpuc.ca.gov/published/Final_decision/52271-06.htm#P145_16910)



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