



SONIA Y. ANGELL, MD, MPH  
State Public Health Officer & Director

State of California—Health and Human Services Agency  
**California Department of Public Health**



GAVIN NEWSOM  
Governor

## **San Onofre Nuclear Generating Station Independent Spent Nuclear Fuel Storage Installation**

**Report period:** March 2020

This report provides radiation data at the San Onofre Nuclear Generating Station (SONGS) Independent Spent Fuel Storage Installation (ISFSI). The information was gathered according to an agreement between SONGS and the California Department of Public Health Radiologic Health Branch (RHB).

### **Dry Storage at SONGS**

The first used fuel assemblies were transferred from wet (pool) storage to the dry cask storage units in the TN-NUHOMS system in October 2003. In total, 1,187 fuel assemblies are stored in the NUHOMS system in 50 canisters. The Holtec Hi-STORM UMAX dry storage system was constructed between April 2016 and the end of 2017, with the first assemblies transferred in January 2018. Loading of the UMAX system is ongoing with an expected completion date of mid-2020. The Holtec system will house 73 canisters of spent nuclear fuel.

### **Radiation Monitoring**

Radiation level measurements around the ISFSI were initiated before fuel was placed in the NUHOMS system to determine background levels. Radiation measurements using sensitive Thermoluminescent Dosimeters (TLDs) have been made at locations around the ISFSI since then and reported to the Nuclear Regulatory Commission in SONGS Annual Radiological Environmental Operating Reports. These reports (through 2015) are available at [U.S. NRC Radioactive Effluent and Environmental Reports](#), or in the NRC public Document System (ADAMS). Reports beginning in 2016 are available at [SONGS Environmental Monitoring](#).

Additional TLDs were placed around the Holtec ISFSI in 2016 as it was constructed and before operation and have been in place since the first fuel canister was placed in 2018. Gamma-sensitive radiation monitors were added in 2019 at three locations in the ISFSI area and one additional monitor in a control location. The data are summarized in tables with daily averages, maxima, and minima. Those data tables are attached, one for each of the four locations.

More information on radiation monitoring is available at [SONGS Dry Fuel Storage Radiation Monitoring](#).

## Locations

There are three radiation monitors in the ISFSI at locations depicted on the image below:



A fourth radiation monitor, at a control location, is located at the edge of the parking lot north of the ISFSI such that it measures background radiation in an unaffected reference area similar to the ISFSI.



**It is important to note that while fuel transfer operations at SONGS are in progress, elevated radiation level readings will be seen as canisters of spent fuel pass by the continuous radiation monitors. The radiation monitor at Location #3, for instance, is adjacent to the path of the vertical cask transporter as it enters the storage pad for canister downloading. Higher readings will be seen on days in which fuel movement is occurring. Other ISFSI monitors may show these elevated readings as well until the canister is safely placed into its storage module. These temporarily elevated readings are normal and expected.**

### **Fuel Transfer to the ISFSI**

Fuel transfer / download during March 2020 occurred on the following dates:

- 3/5/2020
- 3/12/2020
- 3/19/2020 – 3/20/2020
- 3/27/2020 – 3/28/2020

### **Waste Shipments Offsite**

There were no waste shipments offsite that impacted radiation measurements by the ISFSI Radiation Monitoring system during March 2020.

### **Other**

There were no other relevant activities (i.e. temporary power outage, radiation monitor maintenance, etc.) during March 2020.

**Table 1: Daily Results for March 2020 (in millirem per hour) for Location #1**

<b>Day</b>	<b>Average Dose Rate</b>	<b>Maximum Dose Rate</b>	<b>Minimum Dose Rate</b>
1-Mar	0.022	0.030	0.017
2-Mar	0.022	0.031	0.017
3-Mar	0.022	0.031	0.017
4-Mar	0.022	0.028	0.018
5-Mar	0.033	0.299	0.017
6-Mar	0.022	0.031	0.017
7-Mar	0.022	0.029	0.016
8-Mar	0.022	0.031	0.017
9-Mar	0.022	0.029	0.016
10-Mar	0.022	0.030	0.017
11-Mar	0.022	0.028	0.017
12-Mar	0.031	0.220	0.017
13-Mar	0.022	0.030	0.017
14-Mar	0.022	0.029	0.016
15-Mar	0.022	0.028	0.017
16-Mar	0.022	0.029	0.016
17-Mar	0.022	0.029	0.017
18-Mar	0.022	0.028	0.017
19-Mar	0.036	0.197	0.017
20-Mar	0.023	0.060	0.017
21-Mar	0.022	0.028	0.016
22-Mar	0.022	0.028	0.016
23-Mar	0.022	0.029	0.017
24-Mar	0.022	0.029	0.016
25-Mar	0.022	0.030	0.016
26-Mar	0.022	0.028	0.017
27-Mar	0.097	4.116	0.017
28-Mar	0.025	0.099	0.016
29-Mar	0.022	0.030	0.017
30-Mar	0.022	0.029	0.016
31-Mar	0.022	0.030	0.017

**Table 2: Daily Results for March 2020 (in millirem per hour) for Location #2**

<b>Day</b>	<b>Average Dose Rate</b>	<b>Maximum Dose Rate</b>	<b>Minimum Dose Rate</b>
<b>1-Mar</b>	0.011	0.016	0.008
<b>2-Mar</b>	0.012	0.016	0.009
<b>3-Mar</b>	0.012	0.016	0.008
<b>4-Mar</b>	0.011	0.016	0.008
<b>5-Mar</b>	0.016	0.184	0.008
<b>6-Mar</b>	0.011	0.015	0.008
<b>7-Mar</b>	0.011	0.017	0.008
<b>8-Mar</b>	0.011	0.015	0.008
<b>9-Mar</b>	0.011	0.017	0.008
<b>10-Mar</b>	0.011	0.016	0.008
<b>11-Mar</b>	0.011	0.016	0.008
<b>12-Mar</b>	0.014	0.165	0.008
<b>13-Mar</b>	0.011	0.015	0.008
<b>14-Mar</b>	0.011	0.016	0.008
<b>15-Mar</b>	0.011	0.014	0.008
<b>16-Mar</b>	0.011	0.015	0.008
<b>17-Mar</b>	0.011	0.016	0.009
<b>18-Mar</b>	0.012	0.016	0.008
<b>19-Mar</b>	0.024	0.103	0.009
<b>20-Mar</b>	0.011	0.020	0.008
<b>21-Mar</b>	0.011	0.016	0.008
<b>22-Mar</b>	0.011	0.015	0.008
<b>23-Mar</b>	0.011	0.015	0.008
<b>24-Mar</b>	0.011	0.016	0.008
<b>25-Mar</b>	0.011	0.015	0.008
<b>26-Mar</b>	0.011	0.015	0.008
<b>27-Mar</b>	0.013	0.218	0.009
<b>28-Mar</b>	0.012	0.021	0.009
<b>29-Mar</b>	0.011	0.015	0.008
<b>30-Mar</b>	0.011	0.015	0.008
<b>31-Mar</b>	0.011	0.016	0.008

**Table 3: Daily Results for March 2020 (in millirem per hour) for Location #3**

<b>Day</b>	<b>Average Dose Rate</b>	<b>Maximum Dose Rate</b>	<b>Minimum Dose Rate</b>
<b>1-Mar</b>	0.014	0.020	0.011
<b>2-Mar</b>	0.014	0.019	0.010
<b>3-Mar</b>	0.014	0.020	0.010
<b>4-Mar</b>	0.014	0.019	0.011
<b>5-Mar</b>	0.029	1.406	0.010
<b>6-Mar</b>	0.014	0.020	0.010
<b>7-Mar</b>	0.014	0.020	0.011
<b>8-Mar</b>	0.014	0.019	0.010
<b>9-Mar</b>	0.014	0.018	0.009
<b>10-Mar</b>	0.014	0.019	0.011
<b>11-Mar</b>	0.014	0.020	0.011
<b>12-Mar</b>	0.031	1.291	0.011
<b>13-Mar</b>	0.014	0.021	0.010
<b>14-Mar</b>	0.014	0.022	0.010
<b>15-Mar</b>	0.014	0.019	0.011
<b>16-Mar</b>	0.014	0.020	0.011
<b>17-Mar</b>	0.014	0.020	0.010
<b>18-Mar</b>	0.014	0.021	0.010
<b>19-Mar</b>	0.063	3.227	0.011
<b>20-Mar</b>	0.015	0.033	0.011
<b>21-Mar</b>	0.014	0.020	0.010
<b>22-Mar</b>	0.014	0.017	0.011
<b>23-Mar</b>	0.014	0.020	0.010
<b>24-Mar</b>	0.014	0.019	0.010
<b>25-Mar</b>	0.014	0.020	0.010
<b>26-Mar</b>	0.015	0.019	0.010
<b>27-Mar</b>	0.022	0.499	0.011
<b>28-Mar</b>	0.015	0.028	0.010
<b>29-Mar</b>	0.014	0.019	0.011
<b>30-Mar</b>	0.014	0.019	0.011
<b>31-Mar</b>	0.014	0.021	0.011

**Table 4: Daily Results for March 2020 (in millirem per hour) for Location #4 (Control)**

<b>Day</b>	<b>Average Dose Rate</b>	<b>Maximum Dose Rate</b>	<b>Minimum Dose Rate</b>
<b>1-Mar</b>	0.008	0.011	0.005
<b>2-Mar</b>	0.009	0.011	0.006
<b>3-Mar</b>	0.009	0.012	0.006
<b>4-Mar</b>	0.008	0.012	0.006
<b>5-Mar</b>	0.008	0.012	0.006
<b>6-Mar</b>	0.008	0.012	0.005
<b>7-Mar</b>	0.008	0.012	0.005
<b>8-Mar</b>	0.008	0.011	0.006
<b>9-Mar</b>	0.008	0.012	0.006
<b>10-Mar</b>	0.008	0.011	0.005
<b>11-Mar</b>	0.008	0.013	0.006
<b>12-Mar</b>	0.009	0.013	0.006
<b>13-Mar</b>	0.008	0.011	0.005
<b>14-Mar</b>	0.008	0.012	0.006
<b>15-Mar</b>	0.008	0.011	0.006
<b>16-Mar</b>	0.008	0.012	0.006
<b>17-Mar</b>	0.008	0.012	0.006
<b>18-Mar</b>	0.009	0.012	0.006
<b>19-Mar</b>	0.008	0.011	0.006
<b>20-Mar</b>	0.008	0.011	0.005
<b>21-Mar</b>	0.008	0.012	0.006
<b>22-Mar</b>	0.008	0.012	0.005
<b>23-Mar</b>	0.008	0.011	0.006
<b>24-Mar</b>	0.008	0.011	0.006
<b>25-Mar</b>	0.008	0.011	0.005
<b>26-Mar</b>	0.008	0.011	0.006
<b>27-Mar</b>	0.008	0.012	0.005
<b>28-Mar</b>	0.008	0.011	0.006
<b>29-Mar</b>	0.008	0.013	0.005
<b>30-Mar</b>	0.008	0.012	0.005
<b>31-Mar</b>	0.008	0.011	0.006