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

**Report period:** March 2021

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 transferring of fuel assemblies taking place from January 2018 to August 2020. The Holtec system houses 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.



## **Low-Level Waste Shipments Offsite as Part of SONGS Dismantlement**

SONGS is in the process of dismantlement with rail shipments of low-level radioactive waste periodically leaving the site for disposal.

There were no low-level waste shipments offsite that impacted the radiation measurements by the ISFSI Radiation Monitoring System during March 2021.

### **Other**

On March 28, 2021 at 6:10 A.M. the ISFSI experienced a Loss of Site Power and the ISFSI Emergency Diesel Generator immediately started to power essential loads (this does not include the ISFSI Radiation Monitoring System). The network used to support the ISFSI Radiation Monitoring System was out of service until power was restored to the network on March 29, 2021 at approximately 3:00 P.M., by temporarily aligning the ISFSI Radiation Monitoring System to the ISFSI Emergency Diesel Generator. On March 31, 2021 at approximately 3:45 P.M., normal power was restored to the ISFSI and the ISFSI Radiation Monitoring System was realigned to its normal power supply. For the period there was no power to the ISFSI Radiation Monitoring System data transmitted by the radiation monitors was not collected or stored by the server. Data collected the morning of March 28 was corrupted by the power outage, therefore, there is no data provided for this day.

**Table 1: Daily Results for March 2021 (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>
<b>1-Mar</b>	0.024	0.032	0.018
<b>2-Mar</b>	0.024	0.030	0.018
<b>3-Mar</b>	0.024	0.031	0.017
<b>4-Mar</b>	0.023	0.032	0.017
<b>5-Mar</b>	0.024	0.031	0.018
<b>6-Mar</b>	0.024	0.030	0.018
<b>7-Mar</b>	0.023	0.029	0.018
<b>8-Mar</b>	0.023	0.030	0.018
<b>9-Mar</b>	0.023	0.030	0.017
<b>10-Mar</b>	0.023	0.030	0.018
<b>11-Mar</b>	0.024	0.032	0.017
<b>12-Mar</b>	0.024	0.029	0.017
<b>13-Mar</b>	0.024	0.031	0.017
<b>14-Mar</b>	0.023	0.030	0.018
<b>15-Mar</b>	0.024	0.031	0.017
<b>16-Mar</b>	0.023	0.031	0.018
<b>17-Mar</b>	0.023	0.031	0.018
<b>18-Mar</b>	0.024	0.033	0.019
<b>19-Mar</b>	0.024	0.030	0.017
<b>20-Mar</b>	0.023	0.030	0.017
<b>21-Mar</b>	0.024	0.030	0.017
<b>22-Mar</b>	0.024	0.032	0.017
<b>23-Mar</b>	0.024	0.031	0.017
<b>24-Mar</b>	0.024	0.032	0.018
<b>25-Mar</b>	0.024	0.030	0.018
<b>26-Mar</b>	0.023	0.031	0.017
<b>27-Mar</b>	0.024	0.031	0.017
<b>28-Mar*</b>	N.A.	N.A.	N.A.
<b>29-Mar*</b>	0.023	0.031	0.019
<b>30-Mar</b>	0.024	0.031	0.018
<b>31-Mar</b>	0.024	0.032	0.017

*\*For the period there was no power to the ISFSI Radiation Monitoring System (March 28, 6:10 am – March 29, 2:40 pm), data transmitted by the radiation monitors was not collected or stored by the server. Data collected the morning of March 28 was corrupted by the power outage, therefore, there is no data provided for this day.*

**Table 2: Daily Results for March 2021 (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>	0.009	0.013	0.005
<b>2-Mar</b>	0.009	0.012	0.006
<b>3-Mar</b>	0.009	0.012	0.006
<b>4-Mar</b>	0.009	0.013	0.006
<b>5-Mar</b>	0.009	0.013	0.005
<b>6-Mar</b>	0.009	0.013	0.006
<b>7-Mar</b>	0.009	0.013	0.006
<b>8-Mar</b>	0.009	0.012	0.006
<b>9-Mar</b>	0.008	0.013	0.005
<b>10-Mar</b>	0.008	0.013	0.005
<b>11-Mar</b>	0.009	0.014	0.005
<b>12-Mar</b>	0.009	0.012	0.006
<b>13-Mar</b>	0.009	0.013	0.006
<b>14-Mar</b>	0.009	0.012	0.006
<b>15-Mar</b>	0.009	0.012	0.006
<b>16-Mar</b>	0.009	0.012	0.005
<b>17-Mar</b>	0.009	0.012	0.006
<b>18-Mar</b>	0.009	0.013	0.006
<b>19-Mar</b>	0.009	0.013	0.006
<b>20-Mar</b>	0.009	0.012	0.006
<b>21-Mar</b>	0.009	0.012	0.005
<b>22-Mar</b>	0.009	0.012	0.005
<b>23-Mar</b>	0.009	0.013	0.006
<b>24-Mar</b>	0.009	0.013	0.006
<b>25-Mar</b>	0.009	0.013	0.006
<b>26-Mar</b>	0.008	0.012	0.006
<b>27-Mar</b>	0.008	0.012	0.006
<b>28-Mar*</b>	N.A.	N.A.	N.A.
<b>29-Mar*</b>	0.008	0.012	0.006
<b>30-Mar</b>	0.008	0.013	0.005
<b>31-Mar</b>	0.009	0.012	0.006

*\*For the period there was no power to the ISFSI Radiation Monitoring System (March 28, 6:10 am – March 29, 2:40 pm), data transmitted by the radiation monitors was not collected or stored by the server. Data collected the morning of March 28 was corrupted by the power outage, therefore, there is no data provided for this day*

**Table 3: Daily Results for March 2021 (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>	0.015	0.020	0.010
<b>2-Mar</b>	0.015	0.021	0.012
<b>3-Mar</b>	0.015	0.020	0.010
<b>4-Mar</b>	0.015	0.021	0.011
<b>5-Mar</b>	0.015	0.020	0.011
<b>6-Mar</b>	0.015	0.022	0.011
<b>7-Mar</b>	0.015	0.020	0.011
<b>8-Mar</b>	0.015	0.019	0.011
<b>9-Mar</b>	0.015	0.020	0.011
<b>10-Mar</b>	0.015	0.020	0.010
<b>11-Mar</b>	0.015	0.020	0.011
<b>12-Mar</b>	0.015	0.021	0.011
<b>13-Mar</b>	0.015	0.019	0.010
<b>14-Mar</b>	0.015	0.020	0.011
<b>15-Mar</b>	0.015	0.022	0.011
<b>16-Mar</b>	0.015	0.022	0.011
<b>17-Mar</b>	0.015	0.020	0.011
<b>18-Mar</b>	0.015	0.021	0.011
<b>19-Mar</b>	0.015	0.022	0.011
<b>20-Mar</b>	0.015	0.021	0.010
<b>21-Mar</b>	0.015	0.020	0.011
<b>22-Mar</b>	0.015	0.020	0.011
<b>23-Mar</b>	0.015	0.020	0.011
<b>24-Mar</b>	0.015	0.021	0.011
<b>25-Mar</b>	0.015	0.020	0.011
<b>26-Mar</b>	0.015	0.020	0.010
<b>27-Mar</b>	0.015	0.022	0.011
<b>28-Mar*</b>	N.A.	N.A.	N.A.
<b>29-Mar*</b>	0.015	0.019	0.011
<b>30-Mar</b>	0.015	0.021	0.010
<b>31-Mar</b>	0.015	0.021	0.011

*\*For the period there was no power to the ISFSI Radiation Monitoring System (March 28, 6:10 am – March 29, 2:40 pm), data transmitted by the radiation monitors was not collected or stored by the server. Data collected the morning of March 28 was corrupted by the power outage, therefore, there is no data provided for this day*

**Table 4: Daily Results for March 2021 (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>	0.006	0.009	0.004
<b>2-Mar</b>	0.007	0.010	0.004
<b>3-Mar</b>	0.007	0.010	0.005
<b>4-Mar</b>	0.006	0.009	0.004
<b>5-Mar</b>	0.007	0.010	0.004
<b>6-Mar</b>	0.007	0.010	0.004
<b>7-Mar</b>	0.006	0.009	0.004
<b>8-Mar</b>	0.006	0.009	0.004
<b>9-Mar</b>	0.007	0.009	0.004
<b>10-Mar</b>	0.007	0.009	0.005
<b>11-Mar</b>	0.007	0.011	0.004
<b>12-Mar</b>	0.006	0.010	0.004
<b>13-Mar</b>	0.007	0.010	0.004
<b>14-Mar</b>	0.006	0.010	0.004
<b>15-Mar</b>	0.007	0.009	0.004
<b>16-Mar</b>	0.007	0.011	0.004
<b>17-Mar</b>	0.006	0.009	0.004
<b>18-Mar</b>	0.007	0.009	0.004
<b>19-Mar</b>	0.007	0.010	0.004
<b>20-Mar</b>	0.006	0.009	0.004
<b>21-Mar</b>	0.007	0.011	0.004
<b>22-Mar</b>	0.006	0.009	0.004
<b>23-Mar</b>	0.007	0.010	0.004
<b>24-Mar</b>	0.007	0.010	0.004
<b>25-Mar</b>	0.007	0.010	0.004
<b>26-Mar</b>	0.007	0.011	0.004
<b>27-Mar</b>	0.006	0.009	0.004
<b>28-Mar*</b>	N.A.	N.A.	N.A.
<b>29-Mar*</b>	0.007	0.009	0.004
<b>30-Mar</b>	0.006	0.010	0.004
<b>31-Mar</b>	0.007	0.011	0.004

*\*For the period there was no power to the ISFSI Radiation Monitoring System (March 28, 6:10 am – March 29, 2:40 pm), data transmitted by the radiation monitors was not collected or stored by the server. Data collected the morning of March 28 was corrupted by the power outage, therefore, there is no data provided for this day*