

**Virginia Electric and Power Company
Surry Power Station
5570 Hog Island Road
Surry, Virginia 23883**

November 11, 2022

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-0001

Serial No.: 22-355
SPS:SCN R0
Docket No.: 50-280
License No.: DPR-32

Dear Sir or Madam:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Unit 1.

Report No. 50-280/2022-003-00

This report has been reviewed by the Station Facility Safety Review Committee and will be forwarded to the Management Safety Review Committee.

Very truly yours,



Fred Mladen
Site Vice President
Surry Power Station

Enclosure

Commitments contained in the LER: None

cc: U.S. Nuclear Regulatory Commission, Region II
Marquis One Tower, Suite 1200
245 Peachtree Center Ave., NE
Atlanta, GA 30303-1257

NRC Senior Resident Inspector
Surry Power Station



LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)
(See NUREG-1022, R.3 for instruction and guidance for completing this form
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Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk all: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Surry Power Station Unit 1		2. Docket Number 05000 280	3. Page 1 OF 5
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4. Title
Loss of Emergency Switchgear Room Cooling Due to Use of Incorrect Air Handler Fan V-Belts

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
09	15	2022	2022	003	00	11	11	2022		05000
									Facility Name	Docket Number
										05000

9. Operating Mode 1	10. Power Level 100
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).				

12. Licensee Contact for this LER

Licensee Contact Fred Mladen, Surry Power Station Site Vice-President	Phone Number (Include area code) (757) 365-2001
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
A	VK	FAN	B860	Y					

14. Supplemental Report Expected		15. Expected Submission Date			Month	Day	Year
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)						

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

As part of planned maintenance beginning on 7/29/2022 to 9/15/2022, the air handling unit (AHU) fan V-belts for both of the Unit 1 Emergency Switchgear Room (ESGR) cooling trains (1-VS-AC-6 and 1-VS-AC-7) were replaced. When the AHU was placed in-service, these V-belts eventually failed resulting in the inoperability of one or both of the AHU(s).

The cause of this event was that the V-belt vendor sent a different variant of the BX-99 V-belt ordered (Torq Titan vs. the Grip Notch V-belt expected) and these belts were inadvertently accepted and installed at the station. Contributing to this cause was that there were missed opportunities to recognize that the new V-belts were not the same design as those being replaced.

There were no safety consequences because of this event since the maximum temperature in the room stayed well below the design basis upper limit. Planned corrective actions include procedural enhancements and coaching of personnel to ensure that the parts received at the station comply with those ordered.



**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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1. FACILITY NAME Surry Power Station, Unit 1	2. DOCKET NUMBER 05000- 280	3. LER NUMBER		
		YEAR 2022	SEQUENTIAL NUMBER 003	REV NO. 00

NARRATIVE

PLANT OPERATING CONDITIONS BEFORE THE EVENT

Surry Power Station (SPS) Units 1 and 2 were at 100% power.

1.0 DESCRIPTION OF THE EVENT (EIS codes are identified in the text as [XX])

The Main Control Room/Emergency Switchgear Room (MCR/ESGR) ventilation subsystem [VK] provides fresh air and recirculates and cools the air for personnel and equipment concerns, and the emergency portion of the system supplies provide a source of filtered fresh air to these areas in the event of a nuclear or chemical release.

Air conditioning (A/C), breathing air, and associated equipment are Seismic Class I within the missile-protected boundary and powered from emergency buses to ensure operation during both normal and emergency conditions. Two (2) 100% redundant air handling units (AHUs) [AHU], fed from different power sources, are provided for the ESGR and Relay Room (RR) of each unit. Each AHU is supplied chilled water by one of five chillers [CHU] connected to the same power source as the respective AHU. For the AHU fan [FAN], there are two (2) matched rubber V-belts installed.

The system is designed to limit temperatures in occupied spaces to less than 100°F and in non-occupied spaces to less than 120°F. The AHUs, which serve the Unit 1 ESGR, are 1-VS-AC-6 (powered from the 1J bus) and 1-VS-AC-7 (powered from the 1H bus).

The design basis of the MCR and ESGR air conditioning system (ACS) [ACU] is to maintain the MCR/ESGR envelope temperature within the equipment design limits for 30 days of continuous occupancy after a design basis accident (DBA). The ACS includes five (5) chillers (1-VS-E-4A, 4B, 4C, 4D, and 4E). The chillers supply chilled water to eight (8) AHUs arranged in two (2) independent and redundant chilled water loops.

On 7/29/2022, as part of planned preventative maintenance on the ESGR AHUs, the V-belts on 1-VS-AC-7 were replaced with the same stock number V-belts that have been in-service at Surry Power Station (SPS) for many years. However, the AHU was not placed in-service until 9/14/2022. At that time, SPS personnel were unaware that the V-belts installed had been replaced by the manufacturer from the "old style" Grip Notch V-belts to the "new-style" Torq Titan V-belts.

On 9/16/2022, 1-VS-AC-7 was secured due to a belt slapping noise. An investigation revealed that one of the two belts had come off the sheaves. A new set of Torq Titan V-belts was installed and tensioned after a satisfactory alignment and sheave check were performed.

On 9/15/2022, preventative maintenance was performed on 1-VS-AC-6 that also installed the new Torq Titan V-belts. Those V-belts failed on 9/17/2022 and were replaced with another set of Torq Titan V-belts after an alignment and sheave check. At this point SPS believed issues with both AHUs had been corrected.

On 9/18/2022, the V-belts on 1-VS-AC-7 failed again and were replaced with Torq Titan V-belts. This time an alignment check was performed using a laser alignment tool and the belts were "run in" for four (4) hours, followed by satisfactory vibration readings prior to returning the AHU to operable status.



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Surry Power Station, Unit 1	05000-280	2022	003	00

NARRATIVE

On 9/19/2022, the V-belts on 1-VS-AC-7 failed once again. At that point it was concluded that maintenance fundamentals were not responsible for the failures and further investigation was performed. An older set of Grip Notch V-belts was found, and a side-by-side comparison made between the new and old V-belts. At this time, it was realized that the V-belts were not the same and that the vendor had changed the V-belt line without first notifying the station (as required in the purchase order). The older Grip Notch V-belts were subsequently installed on 1-VS-AC-7 with satisfactory performance to date. Also, on 9/19/2022, 1-VS-AC-6 was declared inoperable since it also had Torq Titan V-belts installed. Those V-belts were subsequently replaced, and the train declared operable on 9/22/2022.

As evidenced by numerous malfunctions of the installed Torq Titan V-belts, it was concluded that neither ESGR cooling train would have been able to perform its 30-day mission time safety function with these V-belts installed. A total of five (5) sets of Torq Titan V-belts were installed associated with the preventative maintenance or to replace failed belts.

The new-style Torq Titan V-belts were installed on 1-VS-AC-7 from 7/29/2022 to 9/19/2022, which resulted in that train being considered inoperable. During this same period, the older-style Grip Notch V-belts were installed on 1-VS-AC-6 until replaced with the new-style Torq Titan belts on 9/15/2022. This resulted in one (1) train of ESGR cooling being operable until 9/15/2022. Technical Specification (TS) 3.23(A)(2)(a)(1) requires that an inoperable train is to be restored within 7-days or be in cold shutdown within the next 36 hours upon the loss of one (1) cooling train. In this case, the Allowed Outage Time (AOT) required action statement was not met.

Additionally, between 9/15/2022 and 9/19/2022, the Torq Titan V-belts were installed on both cooling trains which resulted in both being inoperable. With neither train operable, the TS 3.23(A)(2)(a)(3) AOT action statement requires that one (1) train be restored to operable status within one (1) hour or be in cold shutdown within the next 36 hours. This required action also was not met.

Due to these two (2) instances, an operation or condition prohibited by the station TSs occurred, which is reportable per 10 CFR 50.73(a)(2)(i)(B). Also as mentioned previously, between 9/15/2022 and 9/19/2022, the new-style belts were installed on both cooling trains (1-VS-AC-6 and -7), which resulted in the Unit 1 ESGR having no operable means of cooling. This is a loss of safety function that is reportable per 10 CFR 50.73(a)(2)(v)(A). Finally, due to the loss of both trains due to a similar cause, a common-cause failure situation existed that is reportable per 10 CFR 50.73(a)(2)(vii).

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

There were no safety consequences from this event. The safety-related equipment within the room has an operating temperature limit of 120°F, which meant that the ambient temperature would have had to exceed 110°F before the equipment would be considered inoperable. During the 4-day period when both cooling trains were unavailable, information obtained from the plant logs showed the actual recorded room temperature to be in the mid to upper 70°F range. Consequently, the room temperature never approached the 110°F limit before restoring one (1) AHU to operable status on 9/19/2022. Also, by procedure, operators are required to shut down the unit if the temperature limit is exceeded.

3.0 CAUSE OF EVENT

The cause of this event was that the V-belt vendor sent a different variant of the BX-99 V-belt ordered (Torq Titan vs. the Grip Notch V-belt expected) and these V-belts were inadvertently accepted and installed at the station. Contributing to this cause was that there were missed opportunities to recognize that the new V-belts were not the same design as the V-belts being replaced.



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NARRATIVE

In July 2021, due to decreasing station stock, a purchase order (PO) for additional BX-99 Grip Notch V-belts was placed. These belts were commercially dedicated by Dominion Energy since there are no Appendix B audited suppliers of these belts, which have been used at the station for several years and have performed reliably. The PO specified 4 sets (of 2 belts each) with the Part#/Manufacturer listed as "BX-99 Browning." The PO also contained dimensional criteria based on the existing BX-99 Browning Grip Notch belt.

Upon delivery to the station, the belts were inspected against the PO acceptance criteria, accepted, and placed into stock. Following the apparent cause evaluation into the event, it was revealed that the actual belts delivered were the "Browning BX99 Torq Titan" rather than the "Browning BX-99 Grip Notch" belts ordered. Although the PO specified that Dominion Energy be notified if a different belt line was used, it was later discovered that the vendor had substituted the belts since the Grip Notch line had been discontinued. The substituted Torq Titan belts were very similar in appearance to the Grip Notch belts, e.g., both belts have similar dimensions (within tolerances) for top width, length, and height, as well as identification based on the generic industry standard BX-99 designs; however, it was later learned that there were differences in the belt profile, which led to the belt failing.

4.0 IMMEDIATE CORRECTIVE ACTIONS

Upon recognition of the replacement belt issue, the installed Torq Titan belts were replaced with Grip Notch belts.

5.0 ADDITIONAL CORRECTIVE ACTIONS

An extent of condition review revealed that the Browning Torq Titan belts had not been used in other safety-related A/C equipment applications.

6.0 PLANNED CORRECTIVE ACTIONS

- Enhancements (e.g., use of pictures, etc.) will be made to the belt's procurement documents to enhance recognition of and confirm that the parts ordered are the actual parts received at the station.
- For each of the organizations involved, reinforce expectations about the importance of comparing parts before they are accepted, inventoried, and/or installed in the plant.
- Actively pursuing obtaining replacement V-belts from a different manufacturer.

7.0 SIMILAR EVENTS

No similar events have occurred at Surry Power Station within the last three (3) years.

8.0 ADDITIONAL INFORMATION

SPS Unit 1 and Unit 2 remained at 100% power throughout the repair and return to operability.

Failed Component: Browning BX-99 Torq Titan V-belt manufactured by Browning MFG/Emerson Power Transmission.



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YEAR	SEQUENTIAL NUMBER	REV NO.
2022	003	00

NARRATIVE

9.0 COMMITMENTS

There are no regulatory commitments contained in this report. Actions described in this document represent planned actions and are not regulatory commitments. The planned actions are provided as information only.