



Nuclear Fuel Services, Inc.  
CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

21G-18-0066  
GOV-01-55-18  
ACF-18-0135

June 14, 2018

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

**Subject:** 60-Day Written Notification of Event (NRC Event No. 53384) and 30-Day  
Written Notification of Violation (SNM-124 License Condition S-7)

**Reference:** Docket No. 70-143: SNM License 124

Dear Sir:

On May 4, 2018, at approximately 1540 hours (ET), Nuclear Fuel Services, Inc. (NFS), made a telephone notification to the Nuclear Regulatory Commission (NRC) Operations Center of an event for which 10 CFR 70 Appendix A(c) requires a notification. This letter provides the 60-day written notification of that event as an attachment.

As a result of the event, the Tennessee Department of Environment and Conservation (TDEC) issued a notice of violation for failure to report the noncompliance within 24 hours. This letter also provides the 30-day written notification of the violation as required by SNM-124 License Condition (LC) S-7.

If you or your staff have any questions, require additional information, or wish to discuss this matter further, please contact me or Mr. Tim Knowles, Licensing Manager, at (423) 735-5061. Please reference our unique document identification number (21G-18-0066) in any correspondence concerning this letter.

Sincerely,

**NUCLEAR FUEL SERVICES, INC.**

Richard J. Freudenberger, Director  
Safety and Safeguards

IE72  
NMSS

TAK/pj

- Attachment: 60-Day and 30-Day Notification of Reportable Event
- Enclosure A: Letter from Mr. Richard Freudenberger, Nuclear Fuel Services, Inc., dated May 8, 2018, to Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources (21G-18-0057), without photos
- Enclosure B: Letter from Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources, dated May 18, 2018, to Mr. Richard Freudenberger, Nuclear Fuel Services, Inc.
- Enclosure C: Letter from Mr. Richard Freudenberger, Nuclear Fuel Services, Inc., dated May 31, 2018, to Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources (21G-18-0063)

Copy:

Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region II  
245 Peachtree Center Avenue NE, Suite 1200  
Atlanta, GA 30303-1257

Mr. Leonard Pitts  
Senior Fuel Facility Inspector  
U.S. Nuclear Regulatory Commission  
Region II  
245 Peachtree Center Ave., NE, Suite 1200  
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Mr. Omar Lopez-Santiago  
Chief, Project Branch I  
U.S. Nuclear Regulatory Commission  
Region II  
245 Peachtree Center Ave., NE, Suite 1200  
Atlanta, GA 30303-1257

Mr. Kevin Ramsey  
Senior Project Manager  
Fuel Manufacturing Branch  
Division of Fuel Cycle Safety, Safeguards, and Environmental Review  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Two White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

Ms. Leira Cuadrado  
Project Manager  
Fuel Manufacturing Branch  
Division of Fuel Cycle Safety, Safeguards, and Environmental Review  
Office of Nuclear Material Safety and Safeguards  
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Two White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

Mr. Larry Harris  
Senior Resident Inspector  
U.S. Nuclear Regulatory Commission

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**Attachment**

***60-Day and 30-Day Notification of Reportable Event***

(2 pages to follow)

**60-Day and 30-Day Notification of Reportable Event**

**1. The date, time, and exact location of the event**

The event in question (damage to fire water pipe and subsequent displacement of water/soil to storm drainage system) occurred on May 3, 2018, at approximately 1100 hours (ET). The Tennessee Department of Environment and Conservation (TDEC) was made aware of the event on May 4, 2018. As a result of the report to the TDEC, a concurrent report was made to the NRC Operations Center on May 4, 2018, at 1540 hours (ET). The location of the event is the Nuclear Fuel Services, Inc. (NFS) facility, located in the town of Erwin, Unicoi County, Tennessee.

**2. Radiological or chemical hazards involved, including isotopes, quantities, and chemical and physical form of any material released**

Refer to Enclosures

**3. Actual or potential health and safety consequences to the workers, the public, and the environment, including relevant chemical and radiation data for actual personnel exposures to radiation or radioactive materials or hazardous chemicals produced from licensed materials (e.g., level of radiation exposure, concentration of chemicals, and duration of exposure)**

Refer to Enclosures

**4. The sequence of occurrences leading to the event, including degradation or failure of structures, systems, equipment, components, and activities of personnel relied on to prevent potential accidents or mitigate their consequences**

This is a concurrent report of a 24-hour report that was made to the State of Tennessee regarding a break in the main fire water loop due to construction activities. The damage to the pipe occurred as construction personnel were excavating an area in preparation for a concrete pad. The fire water loop is fed by city water. The break in the fire water pipe caused water and soil to be displaced into the nearby storm drainage system. The water was isolated by closing certain valves within the NFS fire water loop system. The estimate of water loss was between 5,000 to 7,000 gallons. The estimated volume of soil displaced was approximately 1 cubic yard. As a precaution, the storm water

drainage system gate had been closed prior to the beginning of excavation. The vast majority of the water and soil was contained within the storm drainage system; however, the gate does not fully prevent seepage and was partially opened for a short period to prevent the flooding of an adjacent building.

The licensee notified the NRC Resident Inspector at the time of the event.

5. **The probable cause of the event, including all factors that contributed to the event and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned**

Refer to Enclosures

6. **Corrective actions taken or planned to prevent occurrence of similar or identical events in the future and the results of any evaluations or assessments**

Refer to Enclosures

7. **If the event involved an area or equipment with an approved Integrated Safety Analysis, whether the event was identified and evaluated in the Integrated Safety Analysis**

Not applicable

8. **The extent of exposure of individuals to radiation or radioactive materials**

Refer to Enclosures

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**Enclosure A**

***Letter from Mr. Richard Freudenberger, Nuclear Fuel Services, Inc., dated May 8, 2018, to Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources (21G-18-0057), without photos***

(5 pages to follow)



Nuclear Fuel Services, Inc.

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

21G-18-0057  
GOV-05-01-01  
ACF-18-0111

May 8, 2018

Mr. Chris Rhodes  
Environmental Field Office Manager  
Johnson City Environmental Assistance Center  
2305 Silverdale Road  
Johnson City, TN 37601-2162

**Subject: Leakage of City Water from Fire Water Loop and Soil**

**Reference: NPDES Permit No. TNR050873**

Dear Mr. Rhodes:

In accordance with the above reference, Storm Water Pollution Prevention Plan, Section 6.1.3, Nuclear Fuel Services, Inc. (NFS) is submitting written notification of an accidental release of city water and soil to the storm water drainage system. The release is described in Attachment 1 (Fire Water Loop Discharge of City Water and Soil into Storm Water Drainage System). This incident was discussed with you and Tina Robinson on May 4, 2018. Photos, as requested by Ms. Robinson during her on-site inspection, are included in Attachment 2.

If you or your staff have any questions, require additional information, or wish to discuss this, please contact me, or Ms. B. Marie Moore, Environmental Protection and Industrial Safety Section Manager, at (423) 743-1737. Please reference our unique document identification number (21G-18-0057) in any correspondence concerning this letter.

Sincerely,

**NUCLEAR FUEL SERVICES, INC.**

Richard J. Freudenberger, Director  
Safety & Safeguards

BMM/pj

Attachment 1: Fire Water Loop Discharge of City Water and Soil into Storm Water Drainage System

Attachment 2: Photos



21G-18-0057  
GOV-05-01-01  
ACF-18-0111

Copy:

Mrs. Beverly Brown  
State of Tennessee  
Department of Environment & Conservation  
Johnson City Environmental Field Office  
Division of Water Pollution Control  
2305 Silverdale Road  
Johnson City, TN 37601-2162

Ms. Tina Robinson  
Environmental Field Office Manager  
Johnson City Environmental Assistance Center  
2305 Silverdale Road  
Johnson City, TN 37601-2162

Mr. Roger Macklin  
State of Tennessee  
Department of Environment & Conservation  
Division of Radiological Protection  
Environmental Field Office – Knoxville  
3711 Middlebrook Pike  
Knoxville, TN 37921

Mr. Larry Harris  
NRC Resident Inspector

21G-18-0057  
GOV-05-01-01  
ACF-18-0111

**ATTACHMENT 1**

Fire Water Loop Discharge of City Water and Soil  
into Storm Water Drainage System

## **Fire Water Loop Discharge of City Water and Soil into Storm Water Drainage System**

### **I. Description of Upset Condition**

On May 3, 2018, NFS experienced a break in the main fire water loop due to construction activities. The damage to the pipe occurred as construction personnel were excavating with a track hoe to prepare the area for a concrete pad to be poured. The fire water loop is fed by city water. The break in the fire water pipe caused water and soil to be displaced into the nearby storm drainage system. The water was isolated by closing certain valves within the NFS fire water loop system. The amount of water lost is estimated between 5,000 to 7,000 gallons. The estimated volume of soil displaced is approximately 1 cubic yard. The storm water drainage system gate had been closed prior to the construction work as a precaution. The majority of the water and soil was contained within the storm drainage system; however, the gate does not fully prevent seepage and was momentarily opened slightly to prevent the flooding of an adjacent building.

### **II. Cause of Upset Condition**

This event is directly linked to the construction activities described above.

### **III. Period of Upset Condition**

The break in the fire water loop occurred before noon on May 3, 2018. Approximately 4,800 gallons of water were pumped from the excavation and the storm drainage system on May 3, 2018. Approximately 1 cubic yard of soil was removed from the storm drainage system by 6:00 pm on May 4, 2018.

Water samples were collected during and after the event in various downgradient locations and analyzed for gross alpha and gross beta. The pH of the water was 7. See Table on following page.

### **IV. Steps to Reduce, Eliminate, and Prevent Recurrence of Upset Condition**

Repair to the fire water loop piping was completed by approximately 11pm on May 4, 2018. The storm water drainage system was returned to normal use on May 5, 2018.

NFS continues to monitor the South West Ditch with a composite sampler. Composite samples collected on May 4, 2018, and May 7, 2018, will be shipped to an offsite laboratory for isotopic uranium analyses.

Date - Time	Sample Location	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
May 3, 2018			
05/03/18 – 11:30am	Martins Creek Downstream West Side of Railroad Trestle (Grab Sample)	4*	146*
05/03/18 – 12:10pm	South West Ditch (3-day Composite Sample)	25*	11*
05/03/18 – 12:12pm	Martins Creek Downstream at South West Ditch Entrance (Grab Sample)	64*	263*
May 4, 2018			
05/04/18 – 07:10am	Martins Creek Downstream West Side of Railroad Trestle (Grab Sample)	2*	14*
05/04/18 – 07:15am	Martins Creek Downstream at South West Ditch Entrance (Grab Sample)	28*	42*
05/04/18 – 07:15am	South West Ditch (24-hr Composite Sample)	85*	61*
May 4-7, 2018			
05/04/18 - 05/07/18 – 7:15am	South West Ditch (3-day Composite Sample)	31**	29**
* 10 minute count.			
** 60 minute count.			
10 CFR 20 Appendix B, Table 2, Effluent Concentrations, Column 2 Water (Nuclear Regulatory Commission [NRC] Regulatory Limits)			
U-234	3E-7 uCi/ml	300 pCi/L	
Tc-99	6E-5 uCi/ml	60,000 pCi/L	
State of Tennessee Standards for Protection Against Radiation, Table II, Effluent Concentrations, Column 2 Water, Chapter 0400-20-05, Rule 0400-20-05-.161 (TDEC Regulatory Limits)			
U-234	3E-7 uCi/ml	300 pCi/L	
Tc-99	6E-5 uCi/ml	60,000 pCi/L	

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**Enclosure B**

***Letter from Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources, dated May 18, 2018, to Mr. Richard Freudenberger, Nuclear Fuel Services, Inc.***

(2 pages to follow)

Mr. Richard J. Freudenberger  
May 18, 2018  
Page 2

provided to the Division of Water Resources in the appropriate regional Field Office within 24-hours from the time the permittee becomes aware of the circumstances.”

The permittee shall provide the Director with the following information:

- Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.
- Steps being taken to ensure that all cases of noncompliance as defined in NPDES permit TN0002038, Part II, Section C.2.a, are reported within 24 hours to the Johnson City Environmental Field Office.

The Division requests NFS develop and submit by May 31, 2018, a detailed action plan and proposed implementation schedule to comply with and correct the above deficiency.

We would like to thank NFS personnel for their time and assistance during the investigation. If you have any questions concerning this correspondence, please contact Tina Robinson at 423/854-5453 or via e-mail at [Tina.A.Robinson@tn.gov](mailto:Tina.A.Robinson@tn.gov).

Sincerely,



Chris Rhodes  
Environmental Program Manager  
Division of Water Resources  
Johnson City Environmental Field Office

CR/150518135

CC: Ms. Jennifer Dodd, Director, DWR, Nashville (via email)  
Mr. Joshua Boggan, DWR Program Coordinator, Johnson City EFO (via email)  
Ms. Tina Robinson, DWR Program Coordinator, Johnson City EFO (via email)  
Ms. Beverly Brown, DWR Consultant I, Johnson City EFO (via email)  
Mrs. Julie Harse, DWR, Water-Based Systems Unit, Nashville (via email)  
Ms. Erica Fey, DWR Compliance and Enforcement Unit, Nashville (via email)  
File Copy, DWR, Johnson City EFO  
WaterLog Database

21G-18-0066  
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**Enclosure C**

***Letter from Mr. Richard Freudenberger, Nuclear Fuel Services, Inc., dated May 31, 2018, to Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources (21G-18-0063)***

(5 pages to follow)



Nuclear Fuel Services, Inc.

21G-18-0063  
GOV-05-01-01  
ACF-18-0124

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

May 31, 2018

Mr. Chris Rhodes  
Environmental Field Office Manager  
Johnson City Environmental Assistance Center  
2305 Silverdale Road  
Johnson City, TN 37601-2162

- REFERENCES:**
- (1) Nuclear Fuel Services, NPDES Permit Number TN0002038
  - (2) Nuclear Fuel Services, NPDES Permit Number TNR050873
  - (3) Letter from Mr. Richard Freudenberger, Nuclear Fuel Services, Inc., dated May 8, 2018, to Mr. Chris Rhodes, Environmental Program Manager, Division of Water Resources (21G-18-0057)
  - (4) Letter from Chris Rhodes, Environmental Program Manager, Division of Water Resources, dated May 18, 2018, to Mr. Richard Freudenberger, Nuclear Fuel Services, Inc.

**SUBJECT: Response to Notice of Violation**

This letter is in response to the Notice of Violation (NOV) letter dated May 18, 2018, issued to Nuclear Fuel Services, Inc. (NFS). On May 3, 2018, NFS reviewed all of the applicable permits, regulations, and data from the event, and did not believe that this event met the criteria for a 24-hour report to the Division of Water Resources. As result of this NOV however, additional safeguards will be put in place to ensure that your agency receives timely communication of any such event in the future.

On Thursday, May 3, 2018, NFS experienced a break in the main fire water loop due to construction activities. The damage to the pipe occurred as construction personnel were excavating an area in preparation for a concrete pad. The fire water loop is fed by city water. The break in the fire water pipe caused water and soil to be displaced into the nearby storm drainage system. The water was isolated by closing certain valves within the NFS fire water loop system. The estimate of water loss was between 5,000 to 7,000 gallons. The estimated volume of soil displaced was approximately 1 cubic yard. As a precaution, the storm water drainage system gate had been closed prior to the beginning of excavation. The vast majority of the water and soil was contained within the storm drainage system; however, the gate does not fully prevent seepage and was partially opened for a short period to prevent the flooding of an adjacent building.



During and after the event, NFS personnel were dispatched along the west ditch and Martins Creek to observe the presence of any visible sign of a discharge. None was observed. Concurrently, samples along the ditch and creek were taken and analyzed for the presence of radioactivity. This data was collected, compiled, and compared with all applicable federal and state regulatory limits to determine if the event met the criteria for being reportable.

Environmental personnel for the facility were at the site of the release shortly after it began, collected information necessary to make a reportability determination, and determined that none was required. During the determination for reportability, they specifically reviewed the requirements from the NPDES permit authorizing stormwater discharges and the NPDES permit authorizing discharges from our Waste Water Treatment Facility (WWTF).

Lastly, NFS reviewed the applicable Tennessee Radiological Division and US NRC regulations. Specifically, TN 1200-20-05, Table II, Column 2, and Title 10, Code of Federal Regulations (CFR), Part 20, Appendix B, Table 2, release limits to streams were reviewed for applicable radionuclides.

Each of the above mentioned criteria were carefully reviewed for potential noncompliance and reportability. NFS focused on the allowable non-stormwater discharges (chlorinated potable fire protection water), the visual criteria, and the surface water release limits set forth in TN 1200-20-05, Table II, Column 2, and Title 10, CFR, Part 20, Appendix B, Table 2. Because all samples taken from Martins Creek were well below both NRC and State of Tennessee regulatory limits and no visible signs of the discharge were observed, a decision was made that the incident was not subject to the 24-hour reportability requirement. At no time was there a condition that caused a threat to public drinking supplies or a threat to human health or the environment.

In the above mentioned NOV, TDEC requested the following information:

- 1) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

NFS Response:

Immediately following the fire line break, NFS fire protection personnel isolated the necessary valves to stop the flow of water. Once the appropriate valves were isolated, water was pumped from the excavation and adjacent ditch to begin the necessary line repairs. All of the water was collected in totes and processed through our WWTF. The broken line was repaired by a trained and qualified contractor. The repair was completed at approximately 11:00 PM, Friday, May 4, 2018. All required testing was completed on Saturday, May 5, 2018. Once the tests were verified to be acceptable,

the line was placed back into service. All mud and debris, which had collected in the adjacent ditch, was removed by NFS-assigned personnel.

NFS took immediate corrective actions to remedy the cause of this line break and prevent recurrence on other excavation projects. The following actions were also taken:

- On Friday, May 4, 2018, a plant wide stand-down of all contractor excavation activities was ordered. During this stand down, the fire line break was discussed to further educate contractors on the need to be cautious during excavation.
  - Discussions with Project Management and Construction Supervisory personnel were held to evaluate any ongoing or planned projects requiring excavation.
  - The Construction Manager completed a second review of Underground Work Permits versus drawings with known underground utilities to confirm areas with potential interference were documented in Work Packages.
  - Additional oversight is being provided to construction sites with excavations.
- 2) Steps being taken to ensure that all cases of noncompliance as defined in NPDES permit TN0002038, Part II, Section C.2.a, are reported within 24 hours to the Johnson City Environmental Field Office.

**NFS Response:**

NFS environmental personnel promptly (i) arrived at the site of the release; (ii) took appropriate action to determine the nature and extent of any impact on the receiving stream; (iii) recognized that a reportability determination needed to be made; (iv) carefully reviewed relevant permit and rule provisions; and, (v) determined that a 24-hour report was not required, all well before the 24 hour period expired. However, the reportability determination was not consistent with TDEC's expectations. In discussions this week with you and your staff, NFS understands that TDEC's expectation is for communication within 24 hours of any unpermitted discharge containing contaminants entering Martins Creek or the Nolichucky River. NFS will revise the appropriate internal procedure to include this direction. The procedure revision will be completed within 90 days and be tracked internally using the Problem Identification, Resolution, and Correction (PIRCS) system.

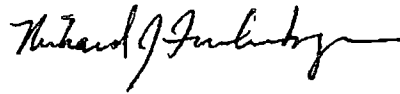
A detailed action plan of how the incident was corrected is detailed within the above response.

NFS does not believe any further enforcement action is warranted on this matter. If you disagree, NFS requests the opportunity to meet and discuss before a final decision is made.

If you or your staff have any questions, require additional information, or wish to discuss this further, please contact me at (423) 743-1705, or Marie Moore, Environmental Protection & Industrial Safety Section Manager, at (423) 743-1737. Please reference our unique document identification number (21G-18-0063) in any correspondence concerning this letter.

Sincerely,

**NUCLEAR FUEL SERVICES, INC.**



Richard J. Freudenberger, Director  
Safety & Safeguards

RJF/pj

Copy:

Mrs. Beverly Brown  
State of Tennessee  
Department of Environment & Conservation  
Johnson City Environmental Field Office  
Division of Water Pollution Control  
2305 Silverdale Road  
Johnson City, TN 37601-2162

Ms. Tina Robinson  
Environmental Field Office Manager  
Johnson City Environmental Assistance Center  
2305 Silverdale Road  
Johnson City, TN 37601-2162

Mr. Roger Macklin  
State of Tennessee  
Department of Environment & Conservation  
Division of Radiological Protection  
Environmental Field Office – Knoxville  
3711 Middlebrook Pike  
Knoxville, TN 37921

Mr. Larry Harris  
NRC Resident Inspector