



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

May 22, 2018

EA-17-187

Dennis R. Madison  
Vice President  
Southern Nuclear Operating Company, Inc.  
Joseph M. Farley Nuclear Plant  
7388 North State Highway 95  
Columbia, AL 36319

**SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - INSPECTION REPORT  
05000348/2018013 AND 05000364/2018013; INVESTIGATION REPORT NO. 2-  
2017-003; AND NOTICE OF VIOLATION**

Dear Mr. Madison:

On September 28, 2017, the U.S. Nuclear Regulatory Commission (NRC) Office of Investigations (OI) completed an investigation to determine if Southern Nuclear Corporation (SNC) managers deliberately directed the alteration of respiratory protective equipment in such a way that it interfered with the proper operation of a Powered Air-Purifying Respirator (PAPR). Based on the results of the investigation, the NRC concluded that an SNC Corporate Fleet Radiation Protection Manager, an SNC Corporate Lead Health Physicist, and an FNP RP Supervisor (senior licensee officials) willfully directed RP personnel to place a cover over the power switch of a PAPR, which did not comply with a Farley procedure and NRC requirements. The alteration adversely affected a contract Field Service Technician's ability to properly operate the device while working in the spent fuel transfer canal. The results of this investigation and inspection are documented in the enclosed Factual Summary and Inspection Report. On May 22, 2018, the NRC discussed the results of the investigation and inspection with you and other members of your staff.

Based on a review of the facts of this case, the NRC determined that a Finding of very low safety significance (Green) and associated Severity Level IV violation of NRC requirements has occurred. The Finding and violation were evaluated in accordance with the Occupational Radiation Safety Significance Determination Process (<https://www.nrc.gov/docs/ML081930811.pdf>) and the NRC's Enforcement Policy (<https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). Contributing factors to the NRC's conclusion included the following: (1) the event was of very low radiological significance because the underlying violation did not result in the worker receiving any unplanned radiological dose; (2) the individuals were attempting to ensure air supply to the worker; and (3) the investigation identified only one instance of wrongdoing for each of the three involved individuals (e.g., for each individual, the act of wrongdoing was not repetitive or widespread). The violation is being cited in the Notice because it does not meet the non-cited violation (NCV) criteria specified in Section 2.3.2 of the Enforcement Policy.

To summarize, on September 8, 2016, FNP staff were conducting pre-outage work related activities in the Unit 1 fuel transfer canal, while using a PAPR. FNP staff experienced a problem with the power button on a technician's PAPR inadvertently getting bumped, thereby de-energizing the PAPR as the technician moved in the cramped transfer canal area. SNC staff subsequently modified the PAPR by the use of a cover over the on/off switch. However, these actions were in violation of the requirements of 10 CFR 20.1703(a), (b) and (e) and SNC Procedure NMP-HP-514. Additionally, the NRC concluded that three SNC senior licensee officials engaged in deliberate misconduct in modifying the PAPR, as discussed in the enclosed Factual Summary.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

If you contest the violation or significance, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Farley Nuclear Plant.

If you disagree with an H.5, Human Performance - Work Management, cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the Farley Nuclear Plant.

This letter, its enclosures, and your response will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

***/RA Mark Miller Acting for/***

Anthony T. Gody, Director  
Division of Reactor Safety

Docket Nos.: 50-348, 50-364

License Nos.: NPF-2, NPF-8

Enclosures:

1. Notice of Violation
2. Factual Summary
3. NRC Inspection Report w/ Attachment  
Supplemental Info

cc: Distribution via ListServ

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - INSPECTION REPORT  
 05000348/2018013 AND 05000364/2018013; INVESTIGATION REPORT NO. 2-  
 2017-003; AND NOTICE OF VIOLATION dated May 22, 2018

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## NOTICE OF VIOLATION

Southern Nuclear Operating Company  
Joseph M. Farley Nuclear Plant  
Units 1 and 2

Docket No.: 50-348, 50-364  
License No.: NPF-2, NPF-8  
EA-17-187

During an NRC investigation completed on September 28, 2017, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 20.1703 states, in part, if the licensee assigns or permits the use of respiratory protection equipment to limit the intake of radioactive material,

(a) The licensee shall use only respiratory protection equipment that is tested and certified by the National Institute for Occupational Safety and Health (NIOSH) except as otherwise noted in this part.

(b) If the licensee wishes to use equipment that has not been tested or certified by NIOSH ... the licensee shall submit an application to the NRC for authorized use of this equipment except as provided in this part. The application must include evidence that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use. This must be demonstrated either by licensee testing or on the basis of reliable test information.

(e) The licensee shall also consider limitations appropriate to the type and mode of use. The licensee shall use equipment in such a way as not to interfere with the proper operation of the respirator.

TS 5.4.1.a, Procedures, requires in part, written procedures to be established, implemented and maintained covering the applicable procedures recommended in RG 1.33, Rev. 2, Feb. 1978, Appendix A. Section 7.e.(5), Respiratory Protection, requires procedures for respiratory protection.

Licensee procedure NMP-HP-514, Operation of the 3M AirMate Hood and PAPR Blower Unit, Version 1.1, provides the following:

Section 5.1.2.2 states, "The [respiratory protective] equipment shall be used in such a way as to not interfere with the proper operation of the respirator."

Section 5.1.3 states, "Only equipment certified by the National Institute for Occupational Safety and Health (NIOSH) or approved by the NRC shall be used when credit is taken for the use of respirators to protect personnel against radioactive material. The 3M Air-Mate Hood and PAPR Blower Unit has been NIOSH approved under TC-21C-635."

Section 5.1.16 states, "DO NOT USE parts not described within this procedure. This action will violate the NIOSH approval (TC-21C-635). The unit MUST be used with the parts described in this procedure regardless of the desired use."

Section 5.1.19 states, "Repair and/or modification of this equipment outside the guidance in this procedure MUST be performed by a qualified individual. Improper repairs or modifications may reduce the effectiveness of the unit and violate the NIOSH approval."

Contrary to the above, on September 8, 2016, the licensee altered a respiratory protective device in such a way that it interfered with the proper operation of a respirator. Specifically, an SNC Corporate Fleet Radiation Protection Manager, an SNC Corporate Lead Health Physicist, and an FNP RP Supervisor directed an RP technician to place a cover over the power switch of a PAPR which subsequently interfered with the proper operation of the respirator worn by a worker. It was determined that the three licensee officials willfully engaged in the use of parts not described in the site's procedure and thus created an assembly that was not tested and approved by NIOSH or authorized by the NRC. The unauthorized alteration of the respirator inhibited a contract employee's ability to properly operate the PAPR while working in the spent fuel transfer canal. The three licensee officials engaged in deliberate misconduct in violation of 10 CFR 50.5(a)(1), which caused SNC to be in violation of 10 CFR 20.1703(a), (b) and (e), and SNC Procedure NMP-HP-514.

This is a Severity Level IV violation (Enforcement Policy Section 6.1).

Pursuant to the provisions of 10 CFR 2.201, Southern Nuclear Operating Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation – EA-17-187" and should include for the violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10

CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 22 day of May, 2018.

**FACTUAL SUMMARY**  
**OFFICE OF INVESTIGATIONS REPORT NO. 2-2017-003**

On September 28, 2017, the Nuclear Regulatory Commission's (NRC) Office of Investigations (OI) completed an investigation at the Southern Nuclear Company's (SNC) Farley Nuclear Plant (FNP). The purpose of the investigation was to determine if SNC employees deliberately directed a contract employee at FNP to use a Powered Air-Purifying Respirator (PAPR) device in such a way that interfered with proper operation of the respirator by securing a cover over the power button, in violation of 10 CFR 20.1703 and licensee procedures.

10 CFR 20.1703 provides regulatory requirements for use of respiratory protection equipment to limit the intake of radioactive material. Southern Nuclear Operating Company Nuclear Management Procedure NMP-HP-514, Operation of 3M Airmate Hood and PAPR Blower Unit, Version 1.1, provides the applicable procedural requirements for operation and use of the PAPR device, to comply with 10 CFR 20.1703. The procedure includes the following requirements:

Section 5.1.2.2 states, "The [respiratory protective] equipment shall be used in such a way as to not interfere with the proper operation of the respirator."

Section 5.1.3 states, "Only equipment certified by the National Institute for Occupational Safety and Health {NIOSH} or approved by the NRC shall be used when credit is taken for the use of respirators to protect personnel against radioactive material. The 3M Air-Mate Hood and PAPA Blower Unit has been NIOSH approved under TC-21C-635."

Section 5.1.16 states, "DO NOT USE parts not described within this procedure. This action will violate the NIOSH approval (TC-21C-635). The unit MUST be used with the parts described in this procedure regardless of the desired use."

Section 5.1.19 states, "Repair and/or modification of this equipment outside the guidance in this procedure MUST be performed by a qualified individual. Improper repairs or modifications may reduce the effectiveness of the unit and violate the NIOSH approval."

On September 7 and 8, 2016, FNP staff and contract employees were conducting pre-outage maintenance activities in the Unit 1 fuel transfer canal while using Powered Air-Purifying Respirators (PAPRs). On September 7, 2016, an SNC worker wearing a respirator inadvertently bumped the power button on his PAPR while working in the transfer canal, thereby de-energizing the PAPR blower unit. On the morning of September 8, 2016, the SNC Corporate Fleet Radiation Protection (RP) Manager, and the SNC Corporate Lead Health Physicist, communicated via various methods to address the PAPR bumping problem that had occurred on the prior day (and other occasions). Without site RP Management knowledge, the SNC Corporate Lead Health Physicist engaged the FNP Radiation Protection Supervisor, who then directed an RP technician to modify a PAPR by taping a plastic cover (petri dish) over the power button. A contract Field Service Technician began performing his assigned duties in the Unit 1 transfer canal wearing the modified PAPR. At some point during the job evolution, the technician backed up against the transfer canal wall, which depressed the petri dish cover and the power button thereby turning the blower unit off. The petri dish cover was crushed into the power button and the individual was unable to turn the belt-mounted blower unit back on. Due to the loss of air flow, the technician cut his hood with scissors to bypass the filtration/blower unit in order to breathe more easily.

The SNC Corporate Fleet RP Manager testified that he was familiar with the requirements of 10 CFR 20.1703 and that he was aware of SNC Procedure NMP-HP-514 requirements. This individual possessed lengthy experience in the nuclear industry, prior training and familiarity with radiation protection requirements, and held a senior position in the licensee's corporate structure.

The SNC Corporate Lead Health Physicist was the author of SNC Procedure NMP-HP-514, and had unparalleled familiarity with its requirements and those of 10 CFR 20.1703. This individual also possessed lengthy experience in the nuclear industry and prior training in radiation protection. This individual was well aware of procedural requirements, including, "DO NOT USE parts not described within this procedure. This action will violate the NIOSH approval (TC-21C-635). The unit MUST be used with the parts described in this procedure regardless of the desired use."

The FNP RP Supervisor acknowledged during transcribed interviews with OI that he was familiar with SNC Procedure NMP-HP-514 and the requirements of 10 CFR Part 20 by virtue of experience, training, and responsibilities. This individual also possessed lengthy experience in the nuclear industry and prior training in radiation protection.



**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Number(s): 50-348 and 50-364

License Number(s): NPF-2 and NPF-8

Report Number(s): 05000348/2018013 and 05000364/2018013

Licensee: Southern Nuclear Corporation

Facility: Farley Nuclear Plant

Location: Columbia, AL

Inspection Dates: October 3, 2016 through March 13, 2018

Inspectors: A. Nielsen, Senior Health Physicist  
W. Pursley, Health Physicist

Approved By: B. Bonser, Chief  
Engineering Branch 3  
Division of Reactor Safety

## SUMMARY

The report covered an in-office review of NRC Office of Investigations (OI) Report No. 2-2017-003 by Region 2 inspectors. One Green Finding and associated Severity Level IV violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 6, dated July 2016. NRC violations are summarized in the table below.

### List of Findings and Violations

Interference with the operation of a respirator			
Cornerstone	Significance/Severity Level	Cross-cutting Aspect	Report Section
Occupational Radiation Safety	Green SLIV NOV 05000348/05000364 2018013-01 Open EA-17-187	H.5 – Human Performance, Work Management	N/A
<p>A self-revealing, Green, Finding and associated Severity Level IV Notice of Violation (NOV) of 10 CFR 20.1703 (a), (b) and (e) and plant Technical Specification (TS) 5.4.1, was identified when licensee personnel altered respiratory protective equipment in such a way that its function was inhibited when worn by a worker. Specifically, on September 8, 2016, a Southern Nuclear Corporation (SNC) Corporate Fleet Radiation Protection (RP) Manager, a SNC Corporate Lead Health Physicist, and a Farley Nuclear Plant (FNP) RP Supervisor willfully directed RP technicians to place a cover over the power switch of a Powered Air-Purifying Respirator (PAPR) in violation of the SNC procedure and NRC regulation.</p>			

## INSPECTION SCOPE

On September 28, 2017, the Nuclear Regulatory Commission's (NRC) Office of Investigations (OI) completed an investigation at the Southern Nuclear Company's (SNC) Farley Nuclear Plant (FNP). The purpose of the investigation was to determine if SNC employees deliberately directed a contract employee at FNP to use a Powered Air-Purifying Respirator (PAPR) in such a way that it interfered with proper operation of the device by securing a protective cover over the power button. The inspectors performed an in office review of the OI summary and transcripts of interviews. In addition, the inspectors discussed the event with RP staff and reviewed relevant documents including condition reports, surveys, and implementing procedures for the licensee's respiratory protection program.

## INSPECTION RESULTS

Interference with the Operation of a Respirator			
Cornerstone	Significance/Severity Level	Cross-cutting Aspect	Report Section
Occupational Radiation Safety	Green SLIV NOV 05000348/05000364 2018013-01 Open EA-17-187	H.5 – Human Performance, Work Management	N/A
<p><u>Introduction and Identification:</u></p> <p>A self-revealing, Green, Finding and associated Severity Level IV Notice of Violation (NOV) of 10 CFR 20.1703 (a), (b) and (e) and plant Technical Specification 5.4.1 was identified when licensee personnel altered respiratory protective equipment in such a way that its function was inhibited when worn by a worker. Specifically, on September 8, 2016, a SNC Corporate Fleet Radiation Protection (RP) Manager, an SNC Corporate Lead Health Physicist, and a FNP RP Supervisor willfully directed RP technicians to place a cover over the power switch of a PAPR, in violation of a site procedure and NRC regulation.</p>			

<p><u>Description:</u></p> <p>On September 7 and 8, 2016, FNP staff and contract employees were conducting pre-outage maintenance activities in the Unit 1 fuel transfer canal while using PAPRs to limit the intake of radioactive material, reduce the likelihood of skin contaminations, and mitigate heat stress. On September 7, 2016, SNC experienced a problem with the power button on a worker's PAPR inadvertently getting bumped while moving around in the cramped transfer canal area, thereby de-energizing the PAPR's belt-mounted blower unit. On the morning of September 8, 2016, the SNC Corporate Fleet RP Manager, the SNC Corporate Lead Health Physicist, and the FNP RP Supervisor communicated via various methods to address the PAPR bumping problem that had occurred the prior day. Subsequently, and without site RP Management knowledge, the SNC Corporate Lead Health Physicist and the FNP Radiation Protection Supervisor directed an RP technician at the job site to modify a PAPR, which included taping a plastic cover over the power button. Once the blower unit was turned on, and the petri dish was affixed, a contract Field Service Technician began performing his assigned duties in the</p>
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Unit 1 transfer canal wearing the modified PAPR. At some point during the job evolution, the technician backed up against the transfer canal wall, which depressed the petri dish cover and the power button underneath, thereby turning the blower unit off. The petri dish itself was crushed into the power button and the individual was unable to turn the blower unit back on. Due to the loss of air flow, the technician cut his hood with scissors in order to bypass the filtration/blower unit and breathe more easily. The individual immediately discontinued his activities and safely exited the transfer canal. There were no personnel contaminations or intakes of radioactive material as a result of this event. The inspectors reviewed surveys and samples of the work area and noted that the radiological risks were very low.

Corrective Action(s): The licensee entered the issue into their corrective action program and conducted a human performance review board to determine lessons learned. Planned corrective actions were 1) communicating the learnings from this event to other SNC sites, 2) considering an operating experience report to the industry, 3) finding a replacement for the current PAPR with a different power switch design less likely to be inadvertently turned off, and 4) developing procedures for the replacement PAPR.

Corrective Action Reference(s): CR 10271222 , CR 10272105

Performance Assessment:

Performance Deficiency: The inspectors determined that the placement of the petri dish over a PAPR power switch was a performance deficiency because it interfered with proper operation of the respirator, which is contrary to the requirements of 10 CFR 20.1703 and licensee procedures.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Program and Process and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609 C, "Occupational Radiation Safety Significance Determination Process". The finding was not related to As Low As Reasonably Achievable (ALARA) planning, nor did it involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

Cross-cutting Aspect: This finding involved the cross-cutting aspect of Human Performance, Work Management, because significant contributors to the event included: 1) time pressure on the work crews to complete pre-outage work, and 2) SNC Corporate RP Management's poor coordination with Site RP Management to effectively evaluate job risks prior to resumption of work.

Enforcement:

See associated Notice of Violation.

**EXIT MEETINGS AND DEBRIEFS**

Unless otherwise noted, no proprietary information was retained by the inspectors or documented in this report.

- On May 22, 2018, Mark Miller, Deputy Director, Division of Reactor Safety presented the integrated inspection results for the quarter with Mr. Dennis R. Madison, Site Vice President, and other members of the licensee staff.

**DOCUMENTS REVIEWED**

NMP-HP-514, Operation of 3M Airmate Hood and PAPR Blower Unit, Version 1. Plant Farley  
Radiological Information Survey #117056, U-1 SFP Transfer Canal (1AB155),  
dated, September 8, 2016  
Radiation Work Permit 16-3466, Revision 0

**CONDITION REPORTS**

CR 10268646  
CR 10271222  
CR 10271590  
CR 10272105  
CR 10272158