VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

10 CFR 50.90

March 30, 2023

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

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Docket Nos.: 50-338/339
50-280/281
License Nos.: NPF-4/7
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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION UNITS 1 AND 2
SURRY POWER STATION UNITS 1 AND 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING
PROPOSED LICENSE AMENDMENT REQUEST TO
REVISE EMERGENCY PLAN STAFF AUGMENTATION TIMES

By letter dated November 7, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22312A550) Virginia Electric and Power Company (Dominion Energy Virginia) submitted a proposed license amendment to the U.S. Nuclear Regulatory Commission (NRC) regarding a revision to the emergency plan staff augmentation times for Surry Power Station, Units 1 and 2 (SPS) and North Anna Power Station, Units 1 and 2 (NAPS).

In an email dated March 1, 2023 (ADAMS Accession No. ML23060A093), the NRC transmitted the final version of a request for additional information (RAI) related to the license amendment request (LAR). Dominion Energy Virginia agreed to respond to the RAI within 30 days of issuance, or no later than March 31, 2023.

Attachment 1 provides Dominion Energy Virginia's response to the RAI. Attachment 2 provides updated versions of the NUREG-0654, Table B-1, Comparative Chart for On-Shift Staffing for NAPS and SPS. Attachment 3 provides mark-up and clean copies of the revised version of Table 5.1 from the NAPS/SPS Emergency Plan. Attachment 4 provides example displays from the Plant Computer System (PCS) showing radiological release pathway monitoring information.

If you have any questions or require additional information, please contact Mr. Shayan Sinha at (804) 273-4687.

Sincerely,

James E. Holloway
Vice President – Nuclear Engineering & Fleet Support
Dominion Energy Virginia

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

Kathryn Hill Barret
Notary Public
Commonwealth of Virginia
Reg. No. 7905256
My Commission Expires January 31, 2024

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mr. James E. Holloway, who is Vice President – Nuclear Engineering & Fleet Support, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 30th day of March, 2023.

My Commission Expires: January 31, 2024.

Kathryn H. Barret
Notary Public

Commitments made in this letter: None.

Attachments:

1. Response to Request for Additional Information Regarding Proposed License Amendment Request to Revise Emergency Plan Staff Augmentation Times
2. Updated Versions of NUREG-0654, Table B-1, Comparative Chart for On-Shift Staffing
3. Revised Versions of Table 5.1 from NAPS/SPS Emergency Plan (Mark-up and Clean Copies)
4. Example Plant Computer System (PCS) Displays for Radiological Release Pathway Monitoring

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ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED LICENSE AMENDMENT REQUEST TO REVISE EMERGENCY PLAN STAFF AUGMENTATION

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION, UNITS 1 AND 2
SURRY POWER STATION, UNITS 1 AND 2

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This attachment provides Dominion Energy Virginia's response to the RAI.

RAI-1 (a and b)

Issue 1.a: As stated in Section 3.2.2.C, "Emergency Direction and Control (Command and Control, Emergency Classification)" of Enclosure 1, "North Anna Power Station, Units 1 and 2: Discussion and Assessment of Proposed Changes," and Enclosure 2, "Surry Power Station, Units 1 and 2: Discussion and Assessment of Proposed Changes," states in part,

> *On-shift staffing for Senior Reactor Operators (SROs) includes a third SRO who is SM [Shift Manager]/SEM [Station Emergency Manager] qualified. This individual is not included in the 10 CFR 50.54(m)(2)(i) requirement and is a resource continuously available for oversight and direction of emergency response.*

This statement is consistent with Table 5.1, "Minimum Staffing Requirements for Emergencies," of the emergency plans for North Anna and Surry which indicate that two Unit Shift Supervisors will be available to provide oversight and an additional Shift Manager will be available to perform classification. In its application, Dominion Energy Virginia is proposing to have three individuals qualified as shift manager/station emergency manager on shift. This does not appear to be consistent with Section 5.0, "Organizational Control of Emergencies," of each site's respective Emergency Plan which states, "the Shift Manager or Unit Supervisor initially acts in the capacity of the Station Emergency Manager (SEM) and takes actions as outlined in the EPIPS [emergency plan implementation procedures]." The guidance of NUREG-0654 Table B-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan", states that there should be one Operations Shift Manager who provides overall ERO command and control and emergency action level (EAL) classification.

NRC Question

RAI-1.a: Provide a description of the specific ERO responsibilities for each of the SROs included on Table 5.1 of the North Anna and Surry emergency plans. In your description, describe who provides overall ERO command and control and EAL classification.

Dominion Energy Virginia Response to RAI-1.a

NAPS and SPS each have one (1) Shift Manager (SM) /SRO and two (2) Unit Supervisors (US)/SROs on-shift, as noted on Table 5.1 of the respective proposed Emergency Plans. The Shift Manager and Unit Supervisors maintain qualifications for the Emergency Plan Station Emergency Manager (SEM) ERO position in the Control Room.

SEM Responsibilities:

The SEM in the control room maintains overall Command and Control of the emergency response effort until relieved by the Technical Support Manager (TSM) in the Corporate Emergency Response Center (CERC) or the Technical Support Center (TSC) SEM in the event that the CERC is not available.

On-Shift SEM Non-Delegable ERO Duties
Event classification
Authorizing notification to the NRC and State/local authorities of emergency status
Recommending protective actions
Authorizing emergency exposure limits
Other ERO Duties
Provide oversight for on-shift Radiation Protection personnel and directs onsite emergency activities

If an emergency occurs on one of the two units, the typical division of responsibilities would be:

SRO1: the Shift Manager depending on the event will generally assume the responsibilities as SEM.

SRO2: the affected Unit Supervisor will maintain operational supervision of the affected Unit.

SRO3: The unaffected Unit Supervisor will maintain operational supervision of the unaffected Unit.

Maintaining the SEM qualification for all three SROs permits flexibility to shift roles between the SEM and the affected Unit Supervisor.

NRC Question

RAI-1.b: The LAR includes Attachments 1-3, North Anna Power Station units 1 and 2: Table B-1 Comparison and 2-3, Surry Power Station units 1 and 2: Table B-1 Comparison (comparison tables) indicating that Emergency Direction and Control will be provided by a Shift Support Supervisor who is a Senior Reactor Operator (SRO) that may be assigned other functions. The comparison tables indicate that the Shift Support Supervisor is in addition to the three SROs on Table 5.1 of the North Anna and Surry emergency plans. Additionally, the North Anna comparison table indicates that the Shift Support Supervisor is also the fire brigade leader.

Provide an explanation for the differences between Table 5.1 of the North Anna and Surry emergency plans and the comparison tables included in the LAR. For North Anna only, this clarification should also discuss the potential conflicts associated with the concurrent performance of the fire brigade leader and emergency direction and control functions during an event requiring both positions.

Dominion Energy Virginia Response to RAI-1.b

The title "Shift Support Supervisor" was used in error on the Table B-1 Comparative Charts. The Title/Expertise descriptions have been updated to reflect titles used in the current Emergency Plans for North Anna and Surry Stations. Updated tables are included in Attachment 2 to this RAI response letter.

The Emergency Plan positions listed in Table 5.1 for NAPS and SPS correctly identify a Shift Manager (SRO), two (2) Unit Supervisors (SROs) and a Shift Technical Advisor (STA) for each site. For NAPS, the site Fire Brigade is led by an Auxiliary Operator on-shift.

RAI-2

Issue 2: As stated in Section 3.2.4.C, "Off-site Dose Assessment Major Task," of Enclosures 1 and 2:

> *Performance of the dose assessment function by the third RP [radiation protection] technician was evaluated in the on-shift staffing analysis using the time motion study methodology. The analysis demonstrated that the function can be performed without conflicts.*

It is not apparent how dose assessment and typical RP tasks such as job coverage, radiation surveys, or conducting RP briefs could be performed concurrently with dose assessment.

NRC Question

RAI-2: Explain how one RP technician can concurrently perform dose assessment and typical RP tasks such as job coverage or radiation surveys. In addition to addressing how the RP technician could be in two physically separate locations, please address the need to focus on important job tasks such as determining off-site dose for elevated and changing effluent conditions and RP tasks while concurrently providing field job coverage in high radiation areas or changing radiological conditions, conducting RP briefs, and performing radiation surveys in unknown, high, or changing radiation areas.

Dominion Energy Virginia Response to RAI-2

The NAPS and SPS proposed Emergency Plan provides for three (3) Radiation Protection Technicians (RPTs) on-shift. The Radiation Protection emergency preparedness functions for each position as described in NUREG-0654, Table B-1, Revision 2 and the proposed site Emergency Plan, Table 5.1 are described in the chart below.

<table>
<tr><th colspan="2">NUREG-0654, Rev 2, Table B-1
Functions Personnel Assigned</th><th colspan="2">NAPS/SPS Proposed Table 5.1
Functions and Personnel Assigned</th></tr>
<tr><td>RP coverage for responders</td><td rowspan="3">1 qualified RP individual per unit (i.e., 2 RPTs)</td><td>RP coverage for responders</td><td rowspan="3">RPT 1 and 2</td></tr>
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<tr><td>Dose Assessment / Projections</td><td>Ancillary duty of on-shift individual</td><td>Radiological Dose Assessment</td><td>RPT 3</td></tr>
</table>

As noted in the chart above, the dose assessment function is performed by the third RPT on-shift (RPT 3) who does not have responsibility for performance of surveys, job coverage or control of dosimetry and Radiologically Controlled Area (RCA) access. This position will remain dedicated to dose assessment until relieved by the augmented ERO within 90 minutes.

Improvements in processes and technology for the Radiological Assessment functional area since 2002 have allowed the sites to streamline activities and reduce burden for on-shift RP staff.

The Dosimetry and RCA Access Control functions have benefited from the use of improved technology in the area of personnel monitoring. NAPS and SPS access control and dosimetry activities are primarily completed through the use of Electronic Dosimeters (EDs) which are obtained prior to entry into radiologically controlled areas (RCA) through

use of pre-established Emergency Plan Radiation Work Permits (RWPs). Specific emergency RWPs have been developed for use during a declared emergency, which automatically set audible emergency dose limits and dose rate alarms at previously determined levels for the Emergency Response RWP. The ED is also used as a "key" to unlock turnstiles to gain access to the RCA. This ensures that the teams dispatched to the in-plant areas to perform activities during a declared emergency will be afforded ample warning/alarm prior to exceeding their allowed dose or dose rate. Use of the ED and RWP process eliminated the need for access control/dosimetry oversight by an RPT for the initial response actions to an event. Additionally, area radiation monitoring capabilities have greatly improved through the implementation of electronic remote monitoring systems/telemetry. By utilizing these enhancements, one technician is able to monitor numerous locations from the remote monitoring station. The use of electronic systems for RCA access has improved efficiency in the dispatch of personnel into the field and reduced the burden of the on-shift RPTs.

The in-plant monitoring process has also benefited from the Plant Computer System (PCS) upgrade in 2002, by improving the availability of data from radiological and effluent monitors while providing the means for trending this information in multiple locations across the site. This capability allows the Unit Supervisors, STA, dose assessor, any RPT with access to a computer screen, in-plant/onsite (out-of-plant) survey and protective measures RPTs to simultaneously access plant system status, radiological effluent readings and flows, and meteorological information. This improved access provides additional defense-in-depth capability for communication of changing conditions related to an event. The extensive in-plant coverage of the monitors, supported by remote reading capability, reduce the need to survey general areas to determine if those areas are impacted by the event. These improvements are detailed further in the response to RAI-3.b.

Dose assessment inputs from radiological and effluent monitors are available through the PCS and from in-plant and onsite survey information which is communicated to the dose assessor by the RPTs in the field via phone or radio. PCS automatically inputs the radiological data into the dose assessment process. In the event of a failure of the automatic data acquisition, the display system has been designed with pull up screens focusing on the data needed by the dose assessor. These improvements allow the two (2) RPTs to more effectively perform in-plant functions and support onsite (out-of-plant) surveys in the immediate vicinity as needed. In the case of an unmonitored release MIDAS has the capability to perform back-calculation of environmental readings. MIDAS uses gamma dose readings to estimate release rates and downwind dose projections. Collection of this data by the RPTs is consistent with the position assignment of surveying to assess radiological protection needed onsite. Table 5.1 of the NAPS and SPS Emergency Plans has been revised to better reflect assignment of RP functions on-shift. The revised Plan pages are provided in Attachment 3 to this RAI response letter.

In conclusion, maintaining one RPT dedicated to dose assessment eliminates the need for one RPT to perform dose assessment and other RP tasks concurrently. Improvements in process and technology also allow the two (2) RPTs not assigned to dose assessment to perform in-plant functions more effectively and support onsite (out-of-plant) surveys in the immediate vicinity, as needed. This change is supported by the on-shift task analysis which showed that the staffing of three (3) RPTs was sufficient to maintain capability for performance of the required functions without conflicts until augmented.

RAI-3 (a, b, c, and d)

Issue 3 (a, b, c, and d): As stated in Section 3.2.4.C, "Off-site Surveys Major Task," of Enclosures 1 and 2,

> *The dispatch of OMTs [Offsite Monitoring Teams] at an Alert or higher classification combined with improvements in monitoring capability and the use of updated dose assessment software as discussed in Section 3.1.4 provides a means for assessing radioactive releases in the early stages of an event. Additionally, prior to the arrival of the OMTs, one of the on-shift RP Technicians are able to perform on-site (out-of-plant) surveys as a means of early identification of releases and provide data inputs to dose assessment. These capabilities serve as the basis for extending the augmentation response time from 60 to 90 minutes.*

A review of the comparison tables for North Anna and Surry indicate that North Anna would remove two field monitoring team members and five RP technicians as 45-minute ERO responders augmenting, and two field monitoring team members and four 60-minute augmenting RP technicians and that Surry would remove one monitoring team member and eleven 60-minute augmenting RP technicians.

The application does not appear to not provide a description of the improved monitoring capabilities at North Anna and Surry that would monitor radioactivity releases that bypassed the effluent radiation monitors. Additionally, the above statement appears to describe a condition where dose assessment would require two RP technicians (one performing dose assessment and one to provide input to dose assessment). The application does not appear to provide a justification for the single RP technician not directly involved with dose assessment. It is not apparent how dose assessment and typical RP tasks such as job coverage, radiation surveys, or conducting RP briefs could be performed concurrently with dose assessment by the on-shift staff.

NRC Question

RAI-3.a: Provide a description of the improved monitoring capabilities at North Anna and Surry that could be used for radioactivity releases that bypass the installed effluent radiation monitors. This description should include an analysis that these instruments can reliably identify and monitor radioactivity releases which bypass the installed effluent radiation monitors.

Dominion Energy Virginia Response to RAI-3.a

The intent of Section 3.2.4.C of the associated LAR submittal was to describe the improved capability to access and trend existing radiological and effluent monitoring data, rather than describe an addition of new monitors.

Currently dose projection software receives radiological and meteorological inputs automatically from PCS. This automatic population of plant data in the MIDAS dose assessment software, in addition to advances in display, trending, and ease of retrieval, are cumulative improvements in monitoring capability. Special PCS screens at both NAPS and SPS have also been developed to allow for fast and easy retrieval of data needed to assess radioactive releases, in the event that data cannot be received automatically. Examples of these displays are provided in Attachment 4 to this RAI response letter.

The PCS upgrade in 2002 improved the availability of data from radiological and effluent monitors, while providing the means for trending this information in multiple locations across the site. This capability allows the Unit Supervisors, STA, dose assessor RPT, in-plant/onsite (out-of-plant) survey and protective measures RPTs to simultaneously access plant system status, radiological effluent readings and flows, and meteorological information. This improved access provides additional defense-in-depth capability for communication of changing conditions related to an event.

Early monitoring for an unmonitored release can be provided by the in-plant/onsite (out-of-plant) and protective measures RPTs in the course of their responsibilities. MIDAS, in its "back-calculation" mode as described below, depends on gamma measurements from field monitoring. Onsite (out-of-plant) locations downwind of the unmonitored release point will show the highest gamma dose rate in the immediate plant vicinity downwind of the release point. These are the same points at which the onsite (out-of-plant) surveys will be taken as part of that responsibility. This provides on-shift staff with the ability to evaluate unmonitored release paths for radiation safety of onsite personnel, in addition to generating dose projections based on the unmonitored release used for EAL and protective active recommendation (PAR) determination until relieved by the augmented ERO staff.

Within the MIDAS software, a specific menu is available for estimation and assessment of unmonitored releases. This menu option back-calculates the release and resulting dose consequences based on an actual reading taken by the in-plant/onsite (out-of-plant) and protective measures RPTs. The software has been designed to accept closed-window (gamma only) field measurements as input to the code.

The combination of improved PCS technology, MIDAS software capabilities, and revised boundaries for conduct of onsite (out-of-plant) surveys provides the means for completion of radiological assessment, implementation of onsite protective measures and dose assessment/projections using on-shift resources. Therefore, the capability to perform these functions as described in NUREG-0654, Revision 2, Table B-1 is maintained until augmented at 90 minutes.

NRC Question

RAI-3.b: Provide a description of the Dominion Energy Virginia site-specific capabilities, that are unique to North Anna and Surry, that support the removal of a qualified individual to perform onsite field monitoring.

Dominion Energy Virginia Response to RAI-3.b

The current NAPS and SPS Emergency Plan assignment for on-shift resources is based on NUREG-0654, Revision 1, Table B-1 criteria as modified by NRC SER for the NAPS/SPS Amendment dated February 27, 2019 (ADAMS Accession No. ML19031B227), as noted in the table below.

NUREG-0654, Rev 1, Table B-1 Functions and Personnel Assigned		**NAPS/SPS Table 5.1 Current Functions and Personnel Assigned**	
RP coverage for responders	Ancillary duty of on-shift RP individuals	RP coverage for responders	RPT 1
Control dosimetry and RCA access		Control dosimetry and RCA access	
In-Plant surveys	1 qualified RP individual per unit (i.e., 2 RPTs)	In-Plant Surveys	RPT 2
Onsite (out-of-plant) surveys	Augmented function	Onsite (out-of-plant) surveys	Augmented function
Offsite Dose Assessment	Augmented function	Radiological Dose Assessment	RPT 3

NUREG-0654, Revision 1, Table B-1 includes on-shift RP personnel for performance of in-plant surveys, RP coverage for responders and Dosimetry/Access Control. The guidance also requires the capability for performance of onsite (out-of-plant) surveys and

dose assessment within 30 minutes, and additional support for these functions within 60 minutes be maintained.

The current NAPS and SPS Emergency Plan assigns one of the three (3) on-shift RPTs to the job coverage and dosimetry/access control functions, a second RPT to the in-plant survey function and the third RPT to the dose assessment function. The availability of the third RPT on-shift exceeds the requirement for dose assessment capability within 30 minutes as stated in the Revision 1 of the NUREG and supports the response of the onsite (out-of-plant) survey team at 45 minutes for NAPS and 60 minutes for SPS. Onsite (out-of-plant) surveys currently include the area outside the Protected Area and within the Site Boundary. Due to the size of the area within the Site Boundary, the onsite (out-of-plant) surveys are completed using an RPT and a driver, which is also the practice for the Offsite Field Monitoring Teams (FMTs).

The proposed NAPS and SPS assignment for on-shift resources is based on NUREG-0654, Revision 2, Table B-1 criteria and provides an alternative means for maintaining the capability for dose assessment, onsite FMT, and Offsite FMT functions at 60 minutes as noted in the table below.

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Functions Personnel Assigned</th><th colspan="2">NAPS/SPS Proposed Table 5.1
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</table>

The proposed NAPS and SPS Emergency Plan provides for the assignment of two of the three (3) on-shift RPTs for the job coverage, dosimetry/access control functions and in-plant/onsite(out-of-plant) surveys.

As stated in the response to RAI-3.a, improvements in the availability of radiological and effluent monitoring data, and trending via PCS since 2002, have significantly reduced the amount of time required for the conduct of in-plant surveys, while maintaining the capability for performance of this function.

The proposed change also includes revising the onsite (out-of-plant) Survey and Offsite Survey areas. The onsite (out-of-plant) survey area is being changed from the area between the protected area (PA) and the Site Boundary, to the area inside the PA. The Offsite Survey is being changed from the area beyond the Site Boundary, to the area

beyond the PA fence. These changes reduce the onsite (out-of-plant) survey footprint so that there is no longer a need for use of a vehicle and a driver. The combination of the reduction in the time needed to evaluate in-plant radiological conditions using new technology, and the accessibility of areas within the PA for manual surveys provides the sites with the ability to obtain information related to plant releases using existing on-shift RP resources. Therefore, the capability to perform this function within 60-minutes continues to be maintained.

Responsibilities of the third RPT, who is dedicated to performing the dose assessment function, remain unchanged. The availability of the third RPT on-shift until augmented at 90 minutes exceeds the requirement for dose assessment capability within 60 minutes as described in Revision 2 of NUREG-0654.

NRC Question

RAI-3.c: Provide an explanation of how the current Dominion Energy Virginia capabilities at North Anna support the removal of 13 RP individuals as 45 and 60-minute responders from the North Anna emergency plan.

Dominion Energy Virginia Response to RAI-3.c

The proposed changes replace the augmented onsite (out-of-plant) Survey Team with two of the on-shift RPTs as described in the response to RAI-3.b and extend the response time of the two (2) Offsite Field Monitoring Teams, six (6) additional RPTs and one (1) dose assessment RP individual from 45 minutes and 60 minutes to 90 minutes.

The combination of improved PCS technology, the capabilities of MIDAS software, the use of electronic dosimetry and pre-established RWPs, and revisions to the boundaries for conduct of onsite (out-of-plant) surveys provides the means for completion of radiological assessment, implementation of onsite protective measures and dose assessment/projections using on-shift resources. Therefore, the capability to perform these functions as described in NUREG-0654, Revision 2, Table B-1 is maintained under the proposed change until augmented at 90 minutes. A comparison table outlining the current RP augmented staffing for NAPS compared to the proposed changes to augmented positions is provided below for added clarity.

Current Augmented RP Staffing			Proposed Augmented RP Staffing	
EP Function	**45 minutes**	**60 minutes**	**EP Function**	**90 minutes**
Dose Assessment (TSC)	1 RP individual		Dose Assessment (TSC)	2 RP individuals
Onsite (out-of-plant) surveys (Out to Site Boundary)	1 RP Technician 1 Other individual (driver)		Onsite (out-of-plant) surveys (Out to PA fence)	(Performed by on-shift RPT 1 or 2)
Offsite Monitoring Team 1 (SB to 10 Miles)	1 RP Technician 1 Other individual (driver)		Offsite Monitoring Team 1 (PA fence to 10 Miles)	1 Offsite Monitoring Team Lead 1 Offsite Monitoring Team Member
Offsite Monitoring Team 2 (SB to 10 Miles)		1 RP Technician 1 Other individual (driver)	Offsite Monitoring Team 2 (PA fence to 10 Miles)	1 Offsite Monitoring Team Lead 1 Offsite Monitoring Team Member
In-Plant Surveys	1 RP Technician	1 RP Technician	In-Plant Survey	2 RP Technicians
Protective Actions	1 RP Technician	3 RP Technicians	Protective Actions	4 RP Technicians
Total	**7 positions**	**6 positions**	**Total**	**12 positions**

NRC Question

RAI-3.d: Provide an explanation of how the current Dominion Energy Virginia capabilities at Surry support the removal of 13 RP individuals as 60-minute responders from the Surry emergency plan.

Dominion Energy Virginia Response to RAI-3.d

The proposed change replaces the augmented onsite (out-of-plant) Survey Team with the two of the on-shift RPTs as described in the response to RAI-3.b and extend the response time of two (2) Offsite Field Monitoring Teams, six (6) RPTs and one (1) dose assessment RP individual from 60 minutes to 90 minutes.

The combination of improved PCS technology, the capabilities of MIDAS software, use of electronic dosimetry and revisions to the boundaries for conduct of onsite (out-of-plant) surveys provides the means for completion of radiological assessment, implementation of onsite protective measures and dose assessment/projections using on-shift resources. Therefore, the capability to perform these functions at 60-minutes is maintained under the proposed change. A comparison table outlining the current RP augmented staffing for SPS compared to the proposed changes to augmented positions is provided below for added clarity.

Current Augmented RP Staffing		Proposed Augment RP Staffing	
EP Function	**60 minutes**	**EP Function**	**90 minutes**
Dose Assessment (TSC)	1 RP individual	Dose Assessment (TSC)	2 RP individuals
Onsite (out-of-plant) surveys (Out to Site Boundary)	1 RP Technician 1 Other individual (driver)	Onsite (out-of-plant) surveys (Out to PA fence)	(Performed by on-shift RPT1 or 2)
Offsite Monitoring Team 1 (SB to 10 Miles)	1 RP Technician 1 Other individual (driver)	Offsite Monitoring Team 1 (PA fence to 10 Miles)	1 Offsite Monitoring Team Lead 1 Offsite Monitoring Team Member
Offsite Monitoring Team 2 (SB to 10 Miles)	1 RP Technician 1 Other individual (driver)	Offsite Monitoring Team 2 (PA fence to 10 Miles)	1 Offsite Monitoring Team Lead 1 Offsite Monitoring Team Member
In-Plant Surveys	2 RP Technicians	In-Plant Survey	2 RP Technicians
Protective Actions	4 RP Technicians	Protective Actions	4 RP Technicians
Total	**13 positions**	**Total**	**12 positions**

RAI-4 (a, b, and c)

Issue 4 (a, b, and c): As stated in Section 3.2.5.C, "Technical Support Major Task," of Enclosures 1 and 2,

> *The procedure analysis demonstrated that the on-shift STA [shift technical advisor] was able to perform required troubleshooting activities for the first 90 minutes after an event through implementation of event response procedures designed for restoration of safety functions to include use of defense-in-depth capabilities as needed. The analysis showed that there were no technical support activities requiring additional mechanical or electrical expertise needed for the first 90 minutes after event initiation.*
>
> *and*
>
> *Additionally, the Mechanical and Electrical Engineers assume responsibility for development of troubleshooting and repair strategies as well as transition from defense in depth applications to use of installed plant safety systems.*

It is not apparent how an analysis of the procedures used by the on-shift staff supports changes to ERO augmentation. Additionally, there are specific training requirements for the STA, electrical engineers, and mechanical engineers. It is not apparent that the STA was qualified and proficient to perform the functions of the STA, mechanical engineer, and the electrical engineer functions during an event. Additionally, it is not apparent the

site-specific procedural requirements to perform troubleshooting for each of these positions.

NRC Question

RAI-4.a: Explain how the STA can concurrently perform the duties of the STA, Reactor Engineer, Mechanical Engineer, and Electrical Engineer during an event. Please describe both the workload and qualifications for each of the positions.

Dominion Energy Virginia Response to RAI-4.a

The Shift Technical Advisor (STA)

Qualifications

The entry level educational and training requirements for the STA are a bachelor's degree in engineering, engineering technology or physical science including coursework in the physical, mathematical or engineering sciences from an accredited institute or Professional Engineer (PE) license. Each STA must also complete license class and maintain their qualifications via Licensed Operator Requalification Program (LORP).

ERO Responsibilities

- Analyze reactor physics, hydraulic and thermodynamic problems arising during the event.
- Complete core damage assessments
- Review critical safety function status.
- Advise the Shift Manager or Unit Supervisor on Operations activities.

Reactor Engineer (Rx Eng)

Qualifications
Baccalaureate in engineering or related science
Four (4) years of related experience
One (1) year nuclear power plant experience
Three (3) months onsite experience

ERO Responsibilities

- Analyze reactor physics, hydraulic and thermodynamic problems arising during the event.
- Complete core damage assessment.
- Assist in developing solutions to the problems.
- Assist in developing procedures necessary to deal with the emergency condition.

Electrical Engineer (EE)

Qualifications
Baccalaureate in engineering or related science
Four (4) years of related experience
One (1) year nuclear power plant experience
Three (3) months onsite experience

ERO Responsibilities
- Analyze electrical issues arising during the event.
- Assist in developing solutions to the problems.
- Assist in developing procedures necessary to deal with the emergency condition.

Mechanical Engineer (ME)

Qualifications
Baccalaureate in engineering or related science
Four (4) years of related experience
One (1) year nuclear power plant experience
Three (3) months onsite experience

ERO Responsibilities
- Analyze mechanical issues arising during the event.
- Assist in developing solutions to the problems.
- Assist in developing procedures necessary to deal with the emergency condition.

The STA performs the tasks of the TSC Technical Support Team until augmented. The procedural analysis conducted to support the associated LAR submittal demonstrated that the shift would be operating in the Emergency Operating Procedures (EOPs) through the 90-minute augmentation period, and additional support from these personnel would not be required during that timeframe. The theory behind the development of the EOPs is described in the response to RAI 4.b

NAPS and SPS have developed Beyond Design Basis (BDB) and FLEX Strategies in accordance with Nuclear Energy Institute (NEI) document 12-06, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, in order to provide protection against a broad range of extreme external hazards. Site-specific assessments of a broad spectrum of possible external hazards were completed in accordance with Appendix B of NEI 12-06 and the strategies resulting from that assessment provide greater diversity and flexibility to cope with a wider range of potential damage states.

A staffing analysis conducted to support the requirements of NEI 12-01 "Guideline for Assessing Beyond Design Basis (BDB) Response Staffing and Communications Capabilities," shows the proposed on-shift staff can effectively implement the FLEX strategies. In addition to the NEI 12-01 analysis, Dominion Energy Virginia conducted a

detailed Engineering Technical Analysis documenting shift capability to implement the FLEX strategies without augmented support. FLEX strategies were developed to eliminate the need for augmented support to the on-shift staff for up to six (6) hours. A detailed description of FLEX strategies and implementation is provided in the response to RAI 6.

The combination of the indication-based EOPs and the application of BDB and FLEX strategies eliminate the need for Electrical or Mechanical Maintenance Engineering resources prior to the proposed augmentation time. This conclusion has been validated via the detailed procedural analysis conducted as part of the associated LAR submittal, and further supported by on-shift staffing analyses.

NRC Question

RAI-4.b: Explain how the STA would use event response procedures to perform required troubleshooting.

Dominion Energy Virginia Response to RAI-4.b

As a clarification to Section 3.2.5.C, "Technical Support Major Task" of Enclosures 1 and 2, the referenced "troubleshooting" actions were meant to convey "diagnostics" consistent with existing EOPs and AOPs. On-shift staff, most significantly the STA performs these diagnostics prior to ERO augmentation.

The event response procedures at NAPS and SPS were developed in accordance with NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures." The purpose of the NUREG was to identify the elements necessary for licensees to prepare and implement a program of EOPs for use by control room personnel to assist in mitigating the consequences of a broad range of accidents and equipment failures. Function-oriented EOPs provide the operator guidance on how to verify the adequacy of critical safety functions and how to restore and maintain these functions when they are degraded. Function-oriented EOPs are written such that an operator, based on indications, moves through the procedures using available equipment to maintain the plant in a safe condition regardless of the specific event. The EOPs were developed from specific Technical Guidelines that identify the equipment or systems to be operated and represent the translation of engineering data derived from transient and accident analysis into information to be used in the writing of EOPs.

Upon completion of the diagnostic steps, the EOPs lead the operator to restore safety functions through transition to and implementation of Functional Restoration Procedures (FRPs). The STA provides independent, objective, and technical assessment of all phases of plant operation with an emphasis on safety related systems. The STA is

predominately concerned with ensuring compliance with various federal regulations, as well as site and unit policies and procedures.

The combined process of diagnosing system failures and restoring safety functions provides for immediate protection of public health and safety, allowing for the conduct of procedurally-driven troubleshooting activities after plant stabilization has been accomplished.

Troubleshooting activities are implemented in accordance with Dominion Energy Nuclear Fleet Procedure MA-AA-103, "Conduct of Troubleshooting" and are performed by Operations and Maintenance. The overall process performed by the various involved departments can be summarized as:

1. Operations provides initial assessment and gathering of information,
2. Maintenance, using the data provided by Operations and working with input from Engineering, as needed, initiate recovery/repair plans for restoration,
3. If the initial maintenance actions are unsuccessful in identifying and resolving the cause of the equipment malfunction then full engagement from Engineering and a more formal troubleshooting process is entered.

The detailed procedural analysis conducted to support the associated LAR submittal showed the procedurally-driven troubleshooting activities performed by Maintenance and Engineering Augmented ERO staff would not be initiated until after the proposed augmentation period of 90 minutes. FLEX strategies and the pre-positioning of critical equipment needed to protect the core were developed for a broad range of extreme events, which provide alternative restoration strategies for the on-shift staff if the site were isolated for up to six (6) hours, thus eliminating the need for the procedurally-driven troubleshooting during this time.

The combination of the indication-based EOPs and the application of BDB and FLEX strategies eliminate the need for Electrical or Mechanical Maintenance Technician resources prior to the proposed augmentation time. This conclusion has been validated via the detailed procedural analysis conducted as part of the associated LAR submittal, and further supported by on-shift staffing analyses.

NRC Question

RAI-4.c: Provide clarification for STA qualifications related to troubleshooting. Specifically, please describe whether the Dominion Energy Virginia STAs are qualified as electrical and mechanical engineers in accordance with the North Anna and Surry systematic approach to training in addition to their STA specific qualifications.

Dominion Energy Virginia Response to RAI-4.c

Dominion Energy Virginia does not require a specific qualification for the performance of troubleshooting as outlined in procedure MA-AA-103, "Conduct of Troubleshooting." Rather, the procedure provides step-by-step instruction to the users. As a result, there is no disparity in qualifications between the STA, Electrical Engineer or Mechanical Engineer which would impact the ability to perform this procedure. Event diagnostics are provided to the licensed operators and the STA as part of position qualifications. The distinctions between EOP-based diagnostics and procedurally-driven troubleshooting are clarified in the response to 4.b.

RAI-5

Issue 5: As stated in Section 3.2.5.C, "Repair and Corrective Action Major Task," of Enclosure 1,

> *The procedure analysis demonstrated that there were no repair or corrective activities required for the first 90 minutes after an event with the exception of installing jumpers to support actions directed by 1/2-ECA-3.3, SGTR Without Pressurizer Pressure Control, and 1/2-FR-H.3, Response to Steam Generator High Level.*

It is not apparent if there is an impact on the current North Anna emergency response based on the information contained in the LAR.

NRC Question

RAI-5: For NAPS, please explain how the procedural step to install jumpers in response to steam generator high level would be performed if needed given that the requisite personnel may not be onsite when required.

Dominion Energy Virginia Response to RAI-5

The current NAPS Emergency Plan includes response by an Electrical Maintenance and an Instrumentation and Control Maintenance individual at 45 minutes from classification of an Alert or higher classification, followed by two (2) Mechanical Maintenance, one (1) additional Electrical Maintenance and one (1) additional I&C Maintenance responder at 60 minutes. NAPS Emergency Contingency Action Procedure 1/2-ECA-3.3, "SGTR Without Pressurized Control," Attachment 4 includes direction for Operations personnel to contact Electrical Maintenance to install a jumper. Similarly, NAPS Function Restoration Procedure 1/2-FR-H.3, "Response to Steam Generator High Level," Attachment 1 also provides this direction.

During the procedure analysis, the two procedures were executed on the NAPS Simulator. For 1/2-ECA-3.3, the simulator run provided the time validation for installation of jumpers in a timeframe commensurate with the existing augmented response time of the Electrical and I&C Maintenance personnel. 1/2-FR-H.3 is a "Yellow Path" procedure per Dominion Energy Nuclear Fleet Procedure OP-AP-104, "Emergency and Abnormal Operating Procedures." Entry into "Yellow Path" procedures is optional and delay in completion of the step does not adversely affect event response.

As a result, the current NAPS emergency response is not impacted by installation of jumpers by maintenance personnel at 45 minutes after Alert or higher classification.

RAI-6 (a, b, c, and d)

Issue 6 (a, b, c, and d): Section 3.2.5.C, "Repair and Corrective Action Major Task," of Enclosures 1 and 2, states:

> *Additionally, in the unlikely event of a failure of ECCS system capabilities at an impacted unit, additional defense in depth is provided by NAPS [SPS] procedures that address a loss of a safety function using installed non-safety plant systems and equipment at the affected unit, the ability to cross-connect some systems with the unaffected unit, and BDB [beyond design basis] strategies and equipment.*

Section 3.1.1, "Performance-based Procedure Analysis" of Enclosures 1 and 2 further states:

> *NUREG-0737 identified the need to consider the following events involving multiple failures:*
>
> - *Multiple tube failures in a single steam generator and tube rupture in more than one steam generator,*
> - *Failure of Main and Auxiliary Feedwater,*
> - *Failure of high-pressure reactor coolant makeup system,*
> - *An Anticipated Transient Without Scram (ATWS) following a loss of offsite power (LOOP), stuck open relief valve or safety relief valve, or loss of main feedwater; and*
> - *Operator errors of omission or commission.*

The current ERO staffing recommendations of NUREG-0654 provide defense-in-depth protection for a broad range of events such as those listed above. Additionally, the staffing recommendations of NUREG-0654 were developed with the understanding that current nuclear power plants were built with emergency support functions (ESFs) that meet current site-specific technical specifications and those plants have incorporated a system-based approach to emergency operating procedures and Abnormal Operating

Procedures. As such, the ESFs and current emergency response procedures at NAPS and SPS do not appear to support extensions in ERO augmentation timing.

Although the current ERO staffing recommendations were developed prior to improved BDB capabilities such as the Diverse and Flexible Coping Strategies (FLEX), the proposed LAR does not appear to provide sufficient detail of the current BDB/FLEX strategies at NAPS and SPS to justify the proposed changes to ERO staffing.

NRC Question

RAI-6.a: Provide a more detailed description of the current Dominion Energy Virginia capabilities and explain how these capabilities could be used to respond to a broad range of events. Include FLEX strategies and specifically provide justification for the proposed extension of ERO response times for the Electrical and Mechanical Engineers.

Dominion Energy Virginia Response to RAI-6.a

Dominion Energy Virginia's capabilities for NAPS and SPS are based on the current EOP/AOP process supporting a broad range of events within the design basis combined with BDB and capabilities developed as part of the overall FLEX Program. The current event response procedures were developed in accordance with NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures". These procedures implement a function-based program to assist in mitigating the consequences of a broad range of accidents and equipment failures. These procedures are indication based and direct the Operations crew through a sequence to determine equipment availability to maintain the plant in a safe condition regardless of the specific event.

The detailed procedural analysis conducted to support the associated LAR submittal showed that the proposed on-shift staff was capable of implementing the EOPs without dependence on augmented personnel prior to the proposed 90-minute augmentation time. The detailed analysis also showed that procedurally-driven troubleshooting, repair and/or corrective actions performed by the augmented ERO would not occur prior to the proposed augmentation time of 90 minutes.

The BDB program provides additional capabilities which support the on-shift staff based on the assumption that the site could be isolated for up to six (6) hours. NAPS and SPS have developed BDB and FLEX Strategies in accordance with NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," to provide protection against a broad range of extreme external hazards. Site-specific assessments of a broad spectrum of possible external hazards were completed in accordance with Appendix B of NEI 12-06 and the strategies resulting from that assessment provide greater diversity and flexibility to cope with a wider range of potential damage states.

The FLEX procedures utilize predeveloped engineering strategies from the NEI 12-06 assessment to provide alternate core cooling designed for use by the on-shift staff, with the assumption that the site will be inaccessible for up to six (6) hours. A staffing analysis in compliance with the requirements of NEI 12-01, "Guideline for Assessing Beyond Design Basis (BDB) Response Staffing and Communications Capabilities," showed that the proposed on-shift staff can effectively implement predeveloped engineering strategies for FLEX without augmented resources. Additionally, a detailed procedural analysis supporting the associated LAR submittal confirmed the diagnostic steps expected in the EOPs and implementation of FLEX strategies can be performed by the proposed on-shift staff.

Sample scenarios evaluated during the staffing analyses included a large break loss of cooling accident (LBLOCA) and station blackout (SBO) with extended loss of AC power. Scenarios assume that the event occurs during off-hours with only on-shift staff available for response.

For the LBLOCA event, there is a loss of offsite power with emergency diesels available and initiation of safety injection (SI). During the first 90 minutes, the objective for Operations per EOPs is to address the SI through implementation of manual actions and transition to FRP FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition," with monitoring of critical safety function status. The FRP provides the steps needed to effectively implement the strategy.

Further supporting the on-shift staffing analysis meeting the requirements of NEI 12-01, Dominion Energy Virginia validated the ability of the isolated on-shift staff to implement strategies through the conduct of a detailed Engineering Technical Analysis. The analysis was intended to reasonably assure required tasks, manual actions and decisions for FLEX strategies are feasible and may be executed within the constraints identified in ETE-CPR-2012-0011 "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document," and the Overall Integrated Plan (OIP) / Final Integrated Plan (FIP) for Order EA-12-049.

The validation process is focused on establishing confidence in the reliability of the actions required. The process included specific analysis for those actions requiring initiation within the six-hour period when the site is anticipated to be inaccessible. The process used for validation included:

- Simulated Scenario – A timed validation method using a simulator or mock-up to validate a decision or action in a procedure/guideline.

- In-plant Timed Walkthroughs and/or Timed Demonstrations – A timed validation method where procedure/guideline performance is simulated by walking through the procedure/guideline steps at the locations specified in the procedure/guideline

and/or by demonstrating the action through the physical deployment of equipment, if appropriate. No manipulation of installed plant equipment is required.

- Reasonable Judgment – A validation method only used to estimate the time required to accomplish a portion of the Timed Sensitive Action (TSA), where Simulator and In-plant Timed Walkthrough methods are not practicable for the task to be performed due to safety of plant/personnel concerns. If used for TSAs classified as Level A (i.e., those started within the first 6 hours), reasonable judgment should be based on prior performance of similar tasks or evaluations. A TSA cannot be validated solely with Level A Reasonable Judgment.

Equipment necessary to accomplish each FLEX strategy was deployed from its storage location and staged at its designated staging point. Any connectivity challenges were identified in the Station's corrective action program and were resolved prior to the required NRC Order compliance date.

The Engineering Technical Analysis demonstrated, with reasonable confidence, the station's ability to execute individual FLEX strategies. Each validation plan demonstrated ample margin to accomplish the strategy with sufficient additional margin to respond to unforeseen challenges.

The combination of the indication-based EOPs and the application of BDB and FLEX strategies eliminate the need for Electrical or Mechanical Engineering resources prior to the proposed augmentation time. This conclusion has been validated via the detailed procedural analysis conducted as part of the associated LAR submittal, and further supported by on-shift staffing analyses.

NRC Question

RAI-6.b: Provide a more detailed description of the current Dominion Energy Virginia capabilities and explain how these capabilities could be used to respond to a broad range of events. This explanation should include FLEX strategies and specifically provide justification for the proposed extension of ERO response times for the ERO mechanical and electrical maintenance technicians. Note: this justification should support an ERO response time when the site could be solely relying on FLEX equipment to mitigate the event.

Dominion Energy Virginia Response to RAI-6.b

Dominion Energy Virginia's capabilities for NAPS and SPS are based on the current EOP/AOP process supporting a broad range of events within the design basis, combined with BDB Strategies and capabilities developed as part of the overall FLEX Program. The current event response procedures were developed in accordance with NUREG-0899,

"Guidelines for the Preparation of Emergency Operating Procedures." These procedures implement a function-based program to assist in mitigating the consequences of a broad range of accidents and equipment failures. These procedures are indication-based and direct the Operations crew through a sequence to determine equipment availability to maintain the plant in a safe condition regardless of the specific event.

The detailed procedural analysis conducted to support the associated LAR submittal showed that the proposed on-shift staff was capable of implementing the EOPs without dependence on augmented personnel prior to the proposed 90-minute augmentation time. The detailed analysis also showed that procedurally-driven troubleshooting, repair and/or corrective actions performed by the augmented ERO would not occur prior to the proposed augmentation time of 90 minutes.

The BDB program provides additional capabilities which support the on-shift staff based on the assumption that the site could be isolated for up to six (6) hours. NAPS and SPS have developed BDB and FLEX Strategies in accordance with NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," to provide protection against a broad range of extreme external hazards. Site-specific assessments of a broad spectrum of possible external hazards were completed in accordance with Appendix B of NEI 12-06 and the strategies resulting from that assessment provide greater diversity and flexibility to cope with a wider range of potential damage states.

The FLEX procedures pre-position key equipment to provide alternate core cooling strategies designed for use by the on-shift staff with the assumption that the site will be inaccessible for up to six (6) hours. A staffing analysis in compliance with the requirements of NEI 12-01, "Guideline for Assessing Beyond Design Basis (BDB) Response Staffing and Communications Capabilities," showed that the proposed on-shift staffing can effectively implement pre-staged equipment for FLEX without augmented resources.

The combination of the indication-based EOPs and the application of BDB and FLEX strategies eliminate the need for Electrical or Mechanical Maintenance Technician resources prior to the proposed augmentation time. This conclusion has been validated via the detailed procedural analysis conducted as part of the associated LAR submittal, and further supported by on-shift staffing analyses.

NRC Question

RAI-6.c: Provide a discussion that demonstrates how the "existing on-shift resources are able to perform troubleshooting activities to initiate restoration of a loss of safety function", as stated in Section 3.2.6.C, "Protective Actions (In-Plant) Function," when no qualified maintenance personnel will be available for 90 minutes in the proposed NAPS and SPS emergency plans.

Dominion Energy Virginia Response to RAI-6.c

Section 3.2.6.C, "Protective Actions (In-Plant) Function," of Enclosures 1 and 2 has been revised to clarify the aspects of troubleshooting initiated by the on-shift staff prior to ERO augmentation. On-shift staff perform diagnostics consistent with existing EOPs. Details associated with the development and use of EOPs, and Technical Guidelines based on engineering data derived from transient accident analysis, and the transition from EOPs to FRPs are provided in the response to RAI-4.b. The combined process of diagnosing system failures and restoring safety functions provides for immediate protection of public health and safety, allowing for the conduct of procedurally-driven troubleshooting activities after plant stabilization has been accomplished.

Dominion Energy Virginia's capabilities for NAPS and SPS are based on the current EOP/AOP process supporting a broad range of events within the design basis combined with BDB Strategies and capabilities developed as part of the overall FLEX Program. The current event response procedures were developed in accordance with NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures". These procedures implement a function-based program to assist in mitigating the consequences of a broad range of accidents and equipment failures. These procedures are indication based and moves the Operations crew through a sequence of determination of available equipment to maintain the plant in a safe condition regardless of the specific event.

The BDB program provides additional capabilities which support the on-shift staff based on the assumption that the site could be isolated for up to six (6) hours. NAPS and SPS have developed BDB and FLEX Strategies in accordance with NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," in order to provide protection against a broad range of extreme external hazards. Site-specific assessments of a broad spectrum of possible external hazards were completed in accordance with Appendix B of NEI 12-06 and the strategies resulting from that assessment provide greater diversity and flexibility to cope with a wider range of potential damage states.

The FLEX procedures utilize predeveloped engineering strategies from the NEI 12-06 assessment to provide alternate core cooling designed for use by the on-shift staff, with the assumption that the site will be inaccessible for up to six (6) hours. A staffing analysis in compliance with the requirements of NEI 12-01, "Guideline for Assessing Beyond Design Basis (BDB) Response Staffing and Communications Capabilities," showed that the proposed on-shift staffing can effectively implement predeveloped engineering strategies for FLEX without augmented resources. Additionally, a detailed procedural analysis supporting the associated LAR submittal confirmed the diagnostic steps expected in the EOPs and implementation of FLEX strategies can be performed by the proposed on-shift staff.

The Engineering Technical Analysis demonstrated the station's ability to execute individual FLEX strategies with reasonable confidence. Each validation plan

demonstrated that the validated strategy had ample margin to accomplish the strategy, with sufficient margins to respond to unforeseen challenges.

Therefore, the EOP-based diagnostic aspects of troubleshooting, which ensure that the plant is maintained in a safe condition, can be performed by the proposed on-shift staff until augmented. This conclusion is supported by the detailed procedural analysis performed for the associated LAR submittal, the on-shift staffing analyses performed to validate FLEX strategies, and the detailed Engineering Technical Analysis performed by Dominion Energy Virginia.

NRC Question

RAI-6.d: Provide a discussion that demonstrates how the current Dominion Energy Virginia capability to respond to events, including FLEX strategies, justifies the proposed extension of RP personnel.

Dominion Energy Virginia Response to RAI-6.d

Dominion Energy Virginia's capabilities for NAPS and SPS are based on the current EOP/AOP process supporting a broad range of events within the design basis combined with BDB Strategies and capabilities developed as part of the overall FLEX Program. The current event response procedures were developed in accordance with NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures". These procedures implement a function-based program to assist in mitigating the consequences of a broad range of accidents and equipment failures. These procedures are indication based and moves the Operations crew through a sequence of determination of available equipment to maintain the plant in a safe condition regardless of the specific event.

The proposed on-shift staff was capable of implementing the EOPs without dependence on augmented personnel prior to the proposed 90-minute augmentation time. The detailed analysis also showed that procedurally-driven troubleshooting, repair and/or corrective actions performed by the augmented ERO would not occur prior to the proposed augmentation time of 90 minutes.

The BDB program provides additional capabilities which support the on-shift staff based on the assumption that the site could be isolated for up to six (6) hours. NAPS and SPS have developed BDB and FLEX Strategies in accordance with NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," in order to provide protection against a broad range of extreme external hazards. Site-specific assessments of a broad spectrum of possible external hazards were completed in accordance with Appendix B of NEI 12-06 and the strategies resulting from that assessment provide greater diversity and flexibility to cope with a wider range of potential damage states.

The FLEX procedures utilize on-shift staff with the assumption that the site will be inaccessible for up to six (6) hours. A staffing analysis in compliance with requirements of NEI 12-01, "Guideline for Assessing Beyond Design Basis (BDB) Response Staffing and Communications Capabilities," showed that the proposed on-shift staffing can effectively implement FLEX strategies without augmented resources.

Since the BDB/FLEX procedures utilize pre-engineered strategies and staging of equipment, eliminating the necessity for 60-minute response by engineering and maintenance personnel, the need for additional RP resources to provide coverage for augmented workers is also eliminated. This conclusion has been validated via the detailed procedural analysis conducted as part of the associated LAR submittal, and further supported by on-shift staffing analyses.

ATTACHMENT 2

UPDATED VERSIONS OF NUREG-0654, TABLE B-1, COMPARATIVE CHART FOR ON-SHIFT STAFFING

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION, UNITS 1 AND 2
SURRY POWER STATION, UNITS 1 AND 2

Updated North Anna NUREG-0654, Table B-1, Comparative Chart for On-Shift Staffing

North Anna (NAPS) *On-Shift* Table Comparison

Major Functional Area and Tasks	Position Title / Expertise	0654 Rev 1 Table B-1 On-shift	NAPS Rev 48 On-Shift	NAPS Rev 52 On-Shift	0654 Rev 2 Table B-1 On-Shift	NAPS Proposed On-shift
Plant Operation and Assessment of Operation Aspects	Station Emergency Manager	1	1	1	1	1
	Shift Supervisor (SRO)	1	2	2		2
	Control Room Operator (RO)	2	4	4		
	Control Room Operator (AO)	2	8	8		
Emergency Direction and Control (Emergency Coordinator) ***	Station Emergency Manager	1**	1**	1**		1**
Notification / Communication **** State/Local and Federal	Emergency Communicator	1****	2**	2**	1**	2
Radiological Accident Assessment						
- Dose Assessment	Rad Assessment Director		1	1	1**	1
- In-Plant/Onsite Surveys	RP Technician	1	1	1		2
- Protective Actions	RP Technician	2**	2**	1	1	
- Chemistry	Chemistry Technician	1	1	1		
Plant System Engineering / Technical Support	Shift Technical Advisor	1	1	1	1	1
Repair and Corrective Actions	Radwaste Operator					
	Electrical Maintenance	1**	1	1*		
	Mechanical Maintenance	1**	1	1*		
	I&C Maintenance					
Firefighting	Fire Department per Tech Specs					
Rescue Operations and First-Aid		2**	1	1		
Site Access Control and Personnel Accountability	Security personnel per security plan					
Total On-Shift		**10**	**22**	**22**	**5**	**9**

*Mechanical and Electrical maintenance personnel are normally on-shift 16 hours per day 7 days per week,
**May be provided by shift personnel assigned other functions
***Overall direction of facility response to be assumed by EOF director when all centers fully manned
****May be performed by engineering aide to shift supervisor

Updated Surry NUREG-0654, Table B-1, Comparative Chart for On-Shift Staffing

Surry (SPS) *On-Shift* Table Comparison

Major Functional Area and Tasks	Position Title / Expertise	0654 Rev 1 Table B-1 On-shift	SPS Rev 40 On-Shift	SPS Rev 68 On-Shift	0654 Rev 2 Table B-1 On-Shift	SPS Proposed On-shift
Plant Operation and Assessment of Operation Aspects	Station Emergency Manager	1	1	1	1	1
	Shift Supervisor (SRO)	1	2	2		2
	Control Room Operator (RO)	2	3	4		
	Control Room Operator (AO)	2	4	7		
Emergency Direction and Control (Emergency Coordinator) ***	Station Emergency Manager	1**	1**	1**		1**
Notification / Communication **** State/Local and Federal	Emergency Communicator	1****	2**	2**	1*	2
Radiological Accident Assessment						
- Dose Assessment	Rad Assessment Director		1**	1	1*	1
- In-Plant/Onsite Surveys	RP Technician	1	2	1		2
- Protective Actions	RP Technician	2**	2**	1	1	
- Chemistry	Chemistry Technician	1	1	1		
Plant System Engineering / Technical Support	Shift Technical Advisor	1	1*	1	1	1
Repair and Corrective Actions	Radwaste Operator		1**			
	Electrical Maintenance	1**	1*	1*		
	Mechanical Maintenance	1**	1*	1*		
	Instrument and Control					
Firefighting	Fire Team Members		5**	3		
Rescue Operations and First-Aid	First Aid Team Members	2**	2**	2**		
Site Access Control and Personnel Accountability	Security Personnel					
Total On-Shift		**10**	**13**	**22**	**5**	**9**

*Mechanical and Electrical maintenance personnel are normally on-shift 16 hours per day 7 days per week,
**May be provided by shift personnel assigned other functions
***Overall direction of facility response to be assumed by EOF director when all centers fully manned
****May be performed by engineering aide to shift supervisor

ATTACHMENT 3

REVISED VERSIONS OF TABLE 5.1

FROM NAPS/SPS EMERGENCY PLAN

(MARK-UP AND CLEAN COPIES)

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION, UNITS 1 AND 2
SURRY POWER STATION, UNITS 1 AND 2

Revised NAPS/SPS Table 5.1 Mark-up

Major Functional Area	Major Tasks	Position Title/Expertise	Proposed On-Shift	Capability for Additions 90 min
Emergency Direction and Control	Oversight	Unit Shift Supervisor (SRO)	2	----
		Technical Support Manager (CERC)	----	1
	Classification	Shift Manager (SRO)	1	----
		Station Emergency Manager (TSC)	----	1
		Emergency Operations Director (TSC)	----	1
Notification/ Communication	Licensee, Local/State Federal personnel and maintain communication	Emergency Communicator (SRO/RO/NO)	2	----
		State/local Communicator (CERC)	----	1
		NRC Emergency Communicator (TSC)	----	1
		State/local Communicator (TSC)	----	1
Radiological Accident Assessment	Offsite Dose Assessment	RP Technician	1	----
		Rad Assessment Coordinator (CERC)	----	1
		Dose Assessment Team Member (CERC)	----	1
		Operational Support Coordinator (CERC)	----	1
		Radiological Assessment Director (TSC)	----	1
		Dose Assessment Team Leader (TSC)	----	1
	Offsite Surveys	Offsite Monitoring Team Leader	----	2
		Offsite Monitoring Team Member	----	2
	In-plant/Onsite (out-of-plant) Surveys And Protective Actions	RP Technicians	~~2~~1	~~6~~2
		~~RP Technician~~	~~4~~	~~4~~
Plant System Engineering	Technical Support	Shift Technical Advisor (SRO/STA)	1	----
		Reactor Engineer (TSC)	----	1
		Electrical Engineer (TSC)	----	1
		Mechanical Engineer (TSC)	----	1
Repair and Corrective	Repair and Corrective Actions	Mechanical Maintenance (OSC)	----	1
		Electrical Maintenance (OSC)	----	1
		I&C Maintenance (OSC)	----	1
		OSC Director (OSC)	----	1
		Mech. Maint. Coordinator (OSC)	----	1
		Elec. Maint. Coordinator (OSC)	----	1
		I&C Maint. Coordinator (OSC)	----	1
		RP Coordinator (OSC)	----	1
Total			9	32

Revised NAPS/SPS Table 5.1 Clean Copy

Major Functional Area	Major Tasks	Position Title/Expertise	Proposed On-Shift	Capability for Additions 90 min
Emergency Direction and Control	Oversight	Unit Shift Supervisor (SRO)	2	——
		Technical Support Manager (CERC)	——	1
	Classification	Shift Manager (SRO)	1	——
		Station Emergency Manager (TSC)	——	1
		Emergency Operations Director (TSC)	——	1
Notification/ Communication	Licensee, Local/State Federal personnel and maintain communication	Emergency Communicator (SRO/RO/NO)	2	——
		State/local Communicator (CERC)	——	1
		NRC Emergency Communicator (TSC)	——	1
		State/local Communicator (TSC)	——	1
Radiological Accident Assessment	Offsite Dose Assessment	RP Technician	1	——
		Rad Assessment Coordinator (CERC)	——	1
		Dose Assessment Team Member (CERC)	——	1
		Operational Support Coordinator (CERC)	——	1
		Radiological Assessment Director (TSC)	——	1
		Dose Assessment Team Leader (TSC)	——	1
	Offsite Surveys	Offsite Monitoring Team Leader	——	2
		Offsite Monitoring Team Member	——	2
	In-plant/Onsite (out-of-plant) Surveys And Protective Actions	RP Technicians	2	6
Plant System Engineering	Technical Support	Shift Technical Advisor (SRO/STA)	1	——
		Reactor Engineer (TSC)	——	1
		Electrical Engineer (TSC)	——	1
		Mechanical Engineer (TSC)	——	1
Repair and Corrective	Repair and Corrective Actions	Mechanical Maintenance (OSC)	——	1
		Electrical Maintenance (OSC)	——	1
		I&C Maintenance (OSC)	——	1
		OSC Director (OSC)	——	1
		Mech. Maint. Coordinator (OSC)	——	1
		Elec. Maint. Coordinator (OSC)	——	1
		I&C Maint. Coordinator (OSC)	——	1
		RP Coordinator (OSC)	——	1
Total			9	32

ATTACHMENT 4

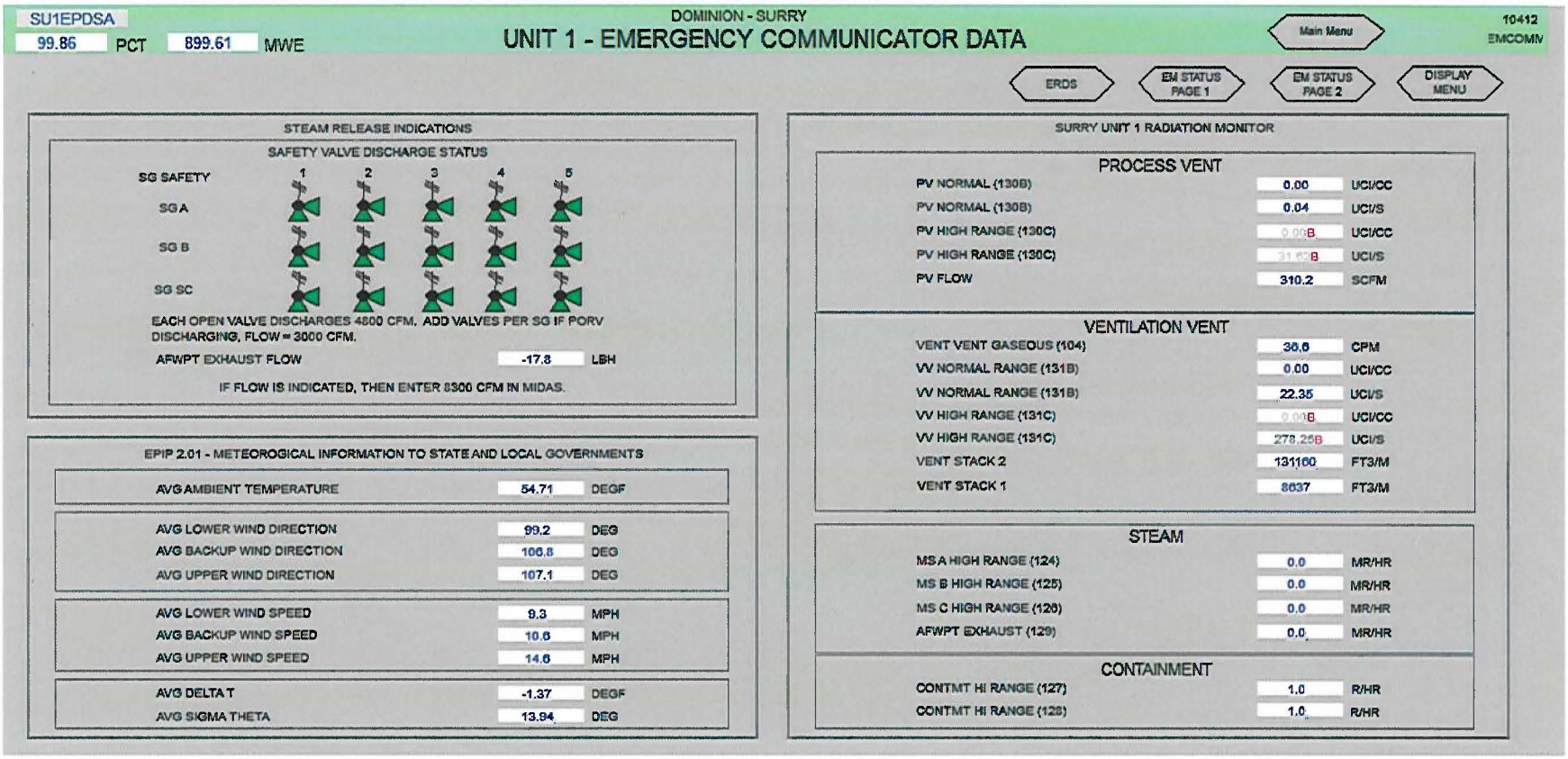
EXAMPLE PLANT COMPUTER SYSTEM (PCS) DISPLAYS FOR RADIOLOGICAL RELEASE PATHWAY MONITORING

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION, UNITS 1 AND 2
SURRY POWER STATION, UNITS 1 AND 2

North Anna Power Station Radioactive Release Pathway PCS Display – SAMPLE

North Anna Power Station Radiological Monitoring Trend PCS Display - SAMPLE

Surry Power Station Radiological Release Pathway PCS Display - SAMPLE



North Anna Power Station Radiological Monitoring Trend PCS Display - SAMPLE