

Enclosure 2

License Amendment Request

Byron Station, Units 1 and 2 Renewed Facility Operating License Nos. NPF-37 and NPF-66 NRC Docket Nos. 50-454, 50-455, and 72-68

EVALUATION OF PROPOSED CHANGES

Subject: License Amendment Request for Approval of Changes to Emergency Plan Staffing Requirements

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1.0 SUMMARY DESCRIPTION

10 CFR 50.47(b) and 10 CFR 50 Appendix E establish emergency planning standards that require 1) adequate staffing; 2) satisfactory performance of key functional areas and critical tasks; and 3) timely augmentation of the response capability.

Exelon Generation Company, LLC (Exelon) is requesting NRC approval of a proposed revision to the Byron Station Radiological Emergency Preparedness Plan. The proposed changes would revise certain Emergency Response Organization (ERO) positions in the Byron Station Emergency Plan. Specifically, the proposed changes would revise certain ERO positions to align with the minimum staff ERO guidance specified in draft Revision 2 of NUREG-0654/FEMA-REP-1, "*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.*"

The proposed changes will also relocate the identified Full Augmentation ERO specified in the Byron Station Emergency Plan Annex EP-AA-1002, Table 2-1, "*Minimum Staff Requirements,*" to an Emergency Preparedness Implementing Procedure (EPIP).

The proposed changes have been reviewed considering the requirements of 10 CFR 50.47, "*Emergency plans,*" paragraph (b), 10 CFR 50 Appendix E, "*Emergency Planning and Preparedness for Production and Utilization Facilities,*" and other applicable emergency preparedness NRC guidance documents. An evaluation of the proposed changes pursuant to 10 CFR 50.54, "*Conditions of licenses,*" paragraph (q), "*Emergency plans,*" determined that the proposed changes result in a reduction in effectiveness of the Emergency Plans for the affected facilities and, therefore, require prior NRC approval.

As specified in Enclosure 8 of this submittal for the Byron Station, Exelon has committed to conduct a confirmation Emergency Preparedness (EP) Drill at one of the affected stations to demonstrate that sufficient staffing capabilities will remain and no loss of EP function will result due to the proposed changes in the ERO staffing. The drill will include each of the Emergency Response Facilities described in the Emergency Plan (i.e., MCR, TSC, OSC, EOF and JIC).

2.0 DETAILED DESCRIPTION

2.1 Proposed Changes

- 2.1.1 The content and format of the Byron Station Emergency Plan Annex EP-AA-1002, Table 2-1, "*Minimum Staff Requirements,*" will be revised to align with the draft NUREG-0654, Revision 2 guidance. This includes revisions to the EP Functions and Major Tasks, as well as the Minimum Staff assigned to these areas. The proposed changes will result in a reduction of some designated Minimum Staff responders and the relocation of the Full Augmentation staff from the Emergency Plan to Byron Station EPIPs, consistent with the NUREG-0654, Revision 2 draft guidance.

The specific wording changes are provided in Attachments 2A and 2B of this enclosure as marked-up and clean copy Emergency Plan pages, respectively. Enclosure 7 contains a task assessment of the Minimum Staff and Full-Augmented Staff removed from the Byron Station Emergency Plan. Enclosure 9 of the License Amendment

Request contains information related to the review of the proposed changes by the State of Illinois.

2.1.2 On-Shift ERO Revision Summary

The Byron Station on-shift staff will align with the guidance specified in draft Revision 2 of NUREG-0654. The proposed changes to the Byron Station Emergency Plan Annex EP-AA-1002, Table 2-1 for the on-shift ERO are described as follows:

- The on-shift Chemistry EP Function is revised to be a collateral function.
- The designated number of Fire Brigade personnel will be removed and the Table will be annotated stating the Function will be controlled per the Fire Protection Plan (FPP).
- The First Aid and Rescue EP Function is removed from the Table, consistent with the draft NUREG-0654, Revision 2 guidance.
- The total number of on-shift Radiation Protection (RP) technicians will remain at two (2); however, the assignment to specific EP Functions and Major Tasks is revised to align with the NUREG-0654, Revision 2 draft guidance.

The table below identifies the current and proposed Byron Station on-shift ERO staffing positions for each EP Function identified in the NUREG-0654, Revision 2 draft guidance.

An on-shift analysis utilizing the guidance and methodology in NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," concluded that the proposed changes did not result in conflicting duties for on-shift ERO personnel.

EP Function	Current On-Shift Staff Positions	Proposed On-Shift Staff Positions
Command and Control	(1) Shift Emergency Director	(1) Shift Emergency Director
Communications	(1) Shift Communicator	(1) Shift Communicator
Radiation Protection (RP) (includes RP protection coverage, in-plant surveys, access control)	(1) RP Personnel	(2) RP Personnel
In Plant Protective Actions	(2) RP Personnel (Collateral duty)	N/A
Supervision of RP	N/A	(1) Shift Emergency Director
Dose Assessment	(1) RP Technician	(1) RP Technician (Collateral duty)

EP Function	Current On-Shift Staff Positions	Proposed On-Shift Staff Positions
Radiological Assessment – Chemistry	(1) Chemistry Personnel	N/A
Emergency Classifications	N/A	(1) Emergency Classification Advisor (Collateral duty)
Engineering	(1) Shift Technical Advisor (STA) (Collateral Duty)	(1) STA (Collateral Duty)
Security	Per the Security Plan	Per the Security Plan
Repair Team Activities	(2) Operations Staff (Collateral Duty)	(2) Operations Staff (Collateral Duty)
Supervision of Repair Team Activities	N/A	(1) Operations Supervisor (Collateral Duty)
Fire Fighting/Fire Brigade	(5) Persons	Per the Fire Protection Plan
First Aid / Rescue Operations	Plant Personnel (Collateral Duty)	N/A

2.1.3 Minimum Staffing

The Byron Station Minimum Staff ERO is revised to be consistent with the draft NUREG-0654, Revision 2 guidance with some exceptions that include:

- No Technical Support Center (TSC) Dose Assessor. This is deemed to be acceptable because the Byron Station Emergency Operations Facility (EOF) is activated at a lower Emergency Classification Level than required by the draft NUREG-0654 guidance for escalating events. The TSC Dose Assessor is not considered necessary because the Byron Station EOF will activate at 60 minutes of an Alert or higher Emergency Classification Level (ECL) and will include an EOF Dose Assessor as Minimum Staff.
- The on-site Field Monitoring Team will not include a driver. Due to the configuration and size of the site within and around the Protected Area (PA) and the limited available roads in that area, a vehicle would not be needed to traverse the site.
- The EOF IT Lead (Computer Specialist) is proposed to be staffed within 90 minutes of an Alert rather than 60 minutes of a Site Area Emergency.
- The TSC does not have an IT Lead staffed at 90 minutes.

The following ERO position will be added to the Byron Station Emergency Plan as Minimum Staff consistent with the draft NUREG-0654, Revision 2 guidance:

- TSC Security Coordinator

- EOF Computer Specialist (staffed at 90 minutes from an Alert)

The following ERO support positions will no longer be considered Minimum Staff under the Byron Station Emergency Plan and will be designated as Full-Augmented staff. The Full-Augmented ERO will be managed under an EPIP consistent with the draft NUREG-0654, Revision 2 guidance.

- TSC Director
- EOF Director
- OSC Chemistry Person
- TSC Technical Manager
- TSC Maintenance Manager
- EOF Logistics Manager
- EOF HPN Communicator
- EOF Environmental Coordinator

The following positions will be reduced in number consistent with the draft NUREG-0654, Revision 2 guidance.

- Electrical/Instrumentation and Controls (I&C) technician – reduction of one (1) position
- Mechanical Technician – reduction of one (1) position
- RP Technician – reduction of one (1) position

Additional changes include:

- The response time for one Offsite Field Team will change from 60 minutes to 90 minutes consistent with the draft NUREG-0654, Revision 2 guidance.
- Three (3) RP technicians will be changed from 60-minute responders to 90-minute responders consistent with the draft NUREG-0654, Revision 2 guidance.

The Byron Station minimum ERO staff positions are being revised as follows:

Current Minimum Staff Positions	Proposed Minimum Staff Positions (response times are 60 minutes unless otherwise noted)
Technical Support Center (TSC)	
Station Emergency Director	Station Emergency Director
Operations Manager	Operations Manager (Emergency Classification Advisor)
ENS Communicator	ENS Communicator
Rad Protection Manager	Rad Protection Manager
Core Thermal/Hydraulic Engineer	Core Thermal Engineer
Mechanical Engineer	Mechanical Engineer
Electrical Engineer	Electrical Engineer

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Current Minimum Staff Positions	Proposed Minimum Staff Positions (response times are 60 minutes unless otherwise noted)
N/A	Added Security Coordinator
TSC Director	Relocated to EPIP as Full Augmentation
Technical Manager	Relocated to EPIP as Full Augmentation
Maintenance Manager	Relocated to EPIP as Full Augmentation
SAMG Decision Maker (collateral duty)	Position removed from Staffing Table
SAMG Evaluator #1 (collateral duty)	Position removed from Staffing Table
SAMG Evaluator #2 (collateral duty)	Position removed from Staffing Table
Emergency Operations Facility (EOF)	
Corporate Emergency Director	Corporate Emergency Director
State / Local Communicator	State / Local Communicator
HPN Communicator	Relocated to EPIP as Full Augmentation
Dose Assessment Coordinator	Dose Assessment Coordinator
Radiation Protection Manager	Radiation Protection Manager
Logistics Manager	Relocated to EPIP as Full Augmentation
Environmental Coordinator	Relocated to EPIP as Full Augmentation
EOF Director	Relocated to EPIP as Full Augmentation
N/A	Added Computer Specialist (@ 90 min)
Joint Information Center	
Corporate Spokesperson	Corporate Spokesperson (@ 90 Min)
JIC Director	JIC Director (@ 90 Min)
Public Information Director	Public Information Director (@ 90 Min)
Operations Support Center (OSC)	
OSC Director	OSC Director
Offsite Field Team #1 Personnel	Offsite Field Team Personnel
Offsite Field Team #1 Driver	Offsite Field Team Driver
Offsite Field Team #2 Personnel	Offsite Field Team Personnel (@ 90 Min)
Offsite Field Team #2 Driver	Offsite Field Team Driver (@ 90 Min)
Onsite Field Team member #1 (onsite surveys)	Onsite Field Team member #1 (onsite surveys)
Onsite Field Team member #2 (onsite surveys)	Deleted
RP Personnel #1 (In plant surveys)	RP Tech #1
RP Personnel #2 (In plant surveys)	RP Tech #2
RP Personnel #1 (In Plant Protective Actions)	RP Tech #3
RP Personnel #2 (In Plant Protective Actions)	RP Tech #4 (@ 90 min)
RP Personnel #3 (In Plant Protective Actions)	RP Tech #5 (@ 90 min)
RP Personnel #4 (In Plant Protective Actions)	RP Tech #6 (@ 90 min)
Electrical/I&C #1 Maintenance	Electrical Maintenance Tech
Electrical/I&C #2 Maintenance	I&C Tech (@ 90 min)
Electrical/I&C #3 Maintenance	Deleted
Mechanical #1 Maintenance	Mechanical Maintenance Tech
Mechanical #2 Maintenance	Deleted
Chemistry Personnel	Relocated to EPIP as Full Augmentation
N/A	Added Elec. Maint. Supv/Lead @90 min

Current Minimum Staff Positions	Proposed Minimum Staff Positions (response times are 60 minutes unless otherwise noted)
N/A	Added Mech. Maint. Supv/Lead @90 min
N/A	Added I&C Supv/Lead @90 min
N/A	Added Rad Protection Supv/Lead @90 min

2.1.4 Full-Augmented Staff

The description of the Full-Augmented Staff contained in the Byron Station Emergency Plan will be relocated to an EPIP. The Byron Station Full-Augmented staff will continue to be notified to respond at an Alert or higher ECL at the same time as the Minimum Staff personnel; however, the Full-Augmentation ERO response is not required to activate the Emergency Response Facility (ERF). Additionally, ERO positions designated as "as needed" in the table below will be qualified for their ERO position; however, the position will be notified to respond to the ERF only if conditions warrant, as determined by the Emergency Director (ED) or his designee.

Position	Response Time	Disposition
Technical Support Center (TSC)		
State/Local Communicator (TSC)	Augmented	Position relocated to EPIP
HPN Communicator (TSC)	Augmented	Position relocated to EPIP
Operations Communicators (TSC)	Augmented	Position relocated to EPIP
Operations Communicators (MCR)	Augmented	Position relocated to EPIP
Damage Control Communicator (TSC)	Augmented	Position relocated to EPIP
Damage Control Communicator (MCR)	Augmented	Position relocated to EPIP
TSC Technical Communicator	Augmented	Position relocated to EPIP
Radiation Control Coordinator	Augmented	Position relocated to EPIP
Radiation Controls Engineer	Augmented	Position relocated to EPIP
Logistics Coordinator	Augmented	Position relocated to EPIP
Security Coordinator (TSC)	Augmented	Position reclassified as Min Staff
Clerical Staff	As Needed	Position relocated to EPIP
Emergency Operations Facility (EOF)		
ENS Communicator	Augmented	Position relocated to EPIP
EOC Communicator (EOF)	Augmented	Position relocated to EPIP
Regulatory Liaison	Augmented	Position relocated to EPIP
Dose Assessor	Augmented	Position relocated to EPIP
Field Team Communicator	Augmented	Position relocated to EPIP
Tech Support Manager	Augmented	Position relocated to EPIP
Operations Advisor	Augmented	Position relocated to EPIP
Technical Advisor	Augmented	Position relocated to EPIP
Administrative Coordinator	Augmented	Position relocated to EPIP
Events Recorder	Augmented	Position relocated to EPIP
Computer Specialist	Augmented	Position reclassified as Min Staff
Security Coordinator	Augmented	Position relocated to EPIP
State Environs Communicator	As needed	Position relocated to EPIP
County EOC Liaison	As needed	Position relocated to EPIP

Position	Response Time	Disposition
State EOC Liaison	As needed	Position relocated to EPIP
Clerical Staff	As needed	Position relocated to EPIP
Joint Information Center (JIC)		
Rad Protection Spokesperson	Augmented	Position relocated to EPIP
Technical Spokesperson	Augmented	Position relocated to EPIP
News Writer	Augmented	Position relocated to EPIP
JIC Coordinator	Augmented	Position relocated to EPIP
Events Recorder	Augmented	Position relocated to EPIP
Access Controller	Augmented	Position relocated to EPIP
Administrative Coordinator	Augmented	Position relocated to EPIP
Rumor Control Staff	As Needed	Position relocated to EPIP
Media Monitor Staff	As Needed	Position relocated to EPIP
Facility Support Staff	As Needed	Position relocated to EPIP
Clerical Staff	As Needed	Position relocated to EPIP
Operations Support Center (OSC)		
Damage Control Communicator (OSC)	Augmented	Position relocated to EPIP
Assistant OSC Director	Augmented	Position relocated to EPIP
Chemistry Personnel	As Needed	Position relocated to EPIP
Operations Lead & Support	As Needed	Position relocated to EPIP
Offsite Field Team Personnel	As Needed	Position reclassified as Min Staff
On Site Field Team Personnel	As Needed	Position reclassified as Min Staff
RP In Plant Surveys	As Needed	Position reclassified as Min Staff
RP Personnel In-Plant Protective Actions	As Needed	Position reclassified as Min Staff
Mechanical Maintenance Personnel	As Needed	Position reclassified as Min Staff
Electrical / I&C Maintenance Personnel	As Needed	Position reclassified as Min Staff
First Aid	As Needed	Position relocated to EPIP

2.2 Reason for the Proposed Changes

The Byron Station Emergency Plan is being revised to align with the recently issued draft NUREG-0654, Revision 2 guidance. The revision to the NUREG-0654 guidance reflects changes to NRC regulations, guidance, and policies, as well as advances in technology and best practices that have occurred since the NUREG guidance was originally issued in November 1980.

2.3 Byron Emergency Plan Background

The Byron Station (Units 1 and 2) is located in northern Illinois, approximately 3.7 miles south-southwest of the City of Byron in Ogle County. The plant consists of two identical Pressurized-Water Reactors (PWRs). The dates for commercial operations were September 1985 for Unit 1 and August 1987 for Unit 2.

The Byron Station Emergency Preparedness Plan consists of the Exelon Nuclear Standardized Radiological Emergency Plan and a Station Emergency Plan Annex. Additionally, the program provides direction and guidance through EPIPs, and

associated program administrative documents. The Emergency Plan outlines the basis for response actions that would be implemented in an emergency. Planning efforts common to all Exelon nuclear stations are encompassed within the Exelon Standardized Emergency Plan. The Standardized Emergency Plan establishes the concepts, evaluation and assessment criteria, and protective actions that are necessary to limit and mitigate the consequences of potential or actual radiological emergencies.

The Byron Station Annex generally contains information and guidance that is unique to the station. The annexes and associated Addendums address site-specific criteria including:

- Emergency Action Levels (EALs) located in Addendum 3 to the Station Annex.
- Differences from the Standardized Emergency Plan (such as station specific staffing commitments, unique aspects of ERO augmentation, etc.).
- Facility geography and location for a full understanding and representation of the station's emergency response capabilities.
- Plant specific facilities and equipment associated with the Emergency Preparedness Program.

2.3.1 Generating Station Emergency Plan (GSEP), Revision 5 – Byron Unit 1's commercial operation date is September 1985. This date corresponded to Revision 5 of the shared Generating Station Emergency Plan (GSEP) and Revision 1 of the Byron Station Emergency Plan Annex. Byron Station's ERO were defined in the GSEP.

2.3.2 GSEP, Revision 7 – In March 31, 1993, Commonwealth Edison (ComEd) submitted Change Request Number 93-01 to revise the ERO organization. The submittal letter stated:

This revision to the GSEP redefines the use and modifies the staffing philosophy of the Corporate Emergency Operations Facility (CEOF), revises Staffing of the CEOF and EOF, and introduces the Significant Alert designation to activate the CEOF.

...During an inspection last year, NRC Region III inspectors identified a concern regarding CECo'e ability to staff off-site emergency response facilities (i.e. Emergency Operations Facilities, or EOFs), within the one hour goal specified in Reference 1. Edison has examined its options to address the one hour facility staffing goal with the intent of relieving the Technical Support Center (TSC) of off-site interface responsibilities. Our approach Involves staffing a corporate EOF within the one hour goal while a nearsite EOF is being staffed. This concept has been discussed in several meetings between Commonwealth Edison. NRC Region III & NRR Staff.

The NRC approved this request in a letter dated February 8, 1996. From the approval letter:

By letters dated March 31 and August 5, 1993, Commonwealth Edison Company (ComEd) submitted proposed changes to its Generating Stations Emergency Plan (GSEP) that included the use of the corporate emergency operations facility (EOF) as an interim EOF until the affected station's near-site EOF is staffed and operational. Additional and clarifying information was provided by ComEd by its letters of September 23, 1993, November 15, 1994, November 22, 1996, December 16, 1994, June 7, 1995, July 21, 1995 and October 2, 1995. The ComEd emergency response strategy involves staffing of the EOFs with personnel from the corporate office and unaffected stations and staffing the onsite emergency facilities (i.e., control room, technical support center and operational support center) with personnel from the affected station.

...As result of the staff's review and the Commission's acceptance of the staff's recommendation, we find ComEd's request to use the corporate EOF as an interim EOF until the near-site EOF is staffed and operational to be acceptable.

- 2.3.3 GSEP, Revision 8 –On January 5, 1995, ComEd submitted a request to consolidate four near-site Emergency Operations Facilities and the Corporate Emergency Operation Facility into a single, central EOF. The four near-site EOFs served six ComEd plants (Braidwood, Byron, Dresden, LaSalle, Quad Cities and Zion). The NRC approved the CEOF in a February 9, 1999, letter stating:

By letter dated January 5, 1995, Commonwealth Edison Company (ComEd) submitted a request to the NRC for review and approval of the consolidation of its four near-site emergency operations facilities (EOFs) and corporate EOF into one single, central EOF.

The staff has reviewed ComEd's request and concluded that the central EOF meets all of the functional as well as the physical requirements (i.e., communications, space, and visual information displays) for EOFs as identified in NRC regulations and supporting documents... Further, the issue of timely staffing of the EOF appears to be adequately addressed by the improvements ComEd has made and committed to in its notification and callout process.

- 2.3.4 GSEP, Revision 11 – In September 2001, as part of the merger with the Philadelphia Electric Company (PECO) and AmerGen stations (Limerick, Peach Bottom, Oyster Creek, and Three Mile Island), additional Full-Augmentation positions were added under 10 CFR 50.54(q) to Byron Station's ERO to establish a mostly common ERO under Revision 11 of the Exelon Standardized Radiological Emergency Plan.

2.4 Minimum Staffing and Full Augmentation as discussed in Byron Station's Emergency Plan

The Byron Station Emergency Plan designates two (2) types of augmented ERO responders. Those designated as Minimum Staff are those key ERO needed to relieve the on-shift staff of key EP functions/tasks required in response to the emergency. Those key functions and associated tasks are identified in NUREG 0654, Section II.B.

Evaluation Criteria 5 of Section II.B of NUREG-0654/FEMA-REP-1, Revision 1, states in part:

Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1.

Those ERO positions designated as Minimum Staffing in the Byron Station Emergency Plan are those required to activate their respective ERF. Specifically, these are the ERO positions that are the absolute minimum needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented). These positions in most cases are required to respond to their respective ERF within 60 minutes of the declaration of an Alert or higher.

..."Facility Activation" refers to the decision to consider a facility fully operational based on the minimum staffing required in ERO staffing tables contained within the station specific Annex and the ability of facility staffing and equipment to perform its designed function(s).

The positions which are considered Full-Augmented Staff (i.e., Non-Minimum Staff) are those positions which provide support for the Minimum Staff in their response to the emergency. While some Full-Augmentation positions were historically described in the Byron Station Emergency Plan, they were only added to Table 2-1, "*Minimum Staffing Requirements for the Exelon ERO*," at the time of the PECO/AmerGen and ComEd merger for the development of a common Exelon fleet Emergency Plan in Revision 11.

The current Byron Station Emergency Plan, in EP-AA-1002, Part II, Section B.5 discusses the Full-Augmentation ERO with the following description:

ERO staffing tables contained within the station specific Annex, outlines ERO positions required to meet minimum staffing and full augmentation of the on-shift complement at an Alert or higher classification, and the major tasks assigned to each position. The full augmentation staffing levels are used as a planning basis to cover a wide range of possible events.

As described in the Byron Station's Emergency Plan, these Full-Augmentation positions consist of liaisons, coordinators, and additional communicators which help facilitate communication and the emergency response effort over time, but are not directly needed to implement the functions/tasks identified in NUREG-0654, Table B-1. The list of Full-Augmented positions and their current assigned tasks are listed in Enclosure 7.

2.5 EOF Activation as discussed in Byron Station's Emergency Plan

The draft NUREG-0654, Revision 2 guidance establishes that the EOF facility activate within 60 minutes of a Site Area Emergency (SAE) or greater ECL. Exelon has elected to activate the EOF within 60 minutes of an Alert or greater ECL. By establishing the EOF at the Alert level, certain EP functions such as Dose Assessment or State/local communications can be established immediately following the Alert classification at the EOF and need not be duplicated at the TSC.

The turnover of Command and Control of EP functions will occur through a conference line between the Main Control Room (MCR), TSC, and EOF simultaneously. In this manner, there will be no delay in transferring functions such as Emergency Action Level (EAL) classifications, State/local Notifications, Protective Action Recommendations (PARs), and Emergency Exposure Control from the MCR to the respective ERF (i.e., TSC or EOF).

2.6 ERO Performance Validation

As part of the implementation of these changes, a confirmation of the capabilities of the final Minimum Staff personnel will be performed through an EP drill to demonstrate that no loss of function will result due to the changes in the ERO. The State of Illinois is invited to participate in this EP drill. Additionally, the NRC will be invited to observe the drill.

In support of this effort, and as documented in Enclosure 8 of this submittal, Exelon's makes the following commitment:

Exelon will conduct a confirmation Emergency Preparedness Drill at one of the affected stations under this License Amendment Request to demonstrate that no loss of EP function will result due to the proposed changes in the ERO. The drill will include each of the Emergency Response Facilities described in the Emergency Plan (i.e., MCR, TSC, OSC, EOF and JIC).

This commitment shall be completed prior to the implementation of the approved license amendment.

2.7 On-Shift Staffing Analysis (OSA)

Regulatory Issue Summary (RIS) 2016-10, "*License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation*," states that an on-shift staffing analysis under 10 CFR 50, Appendix E, Section IV.A.9 should not be used to provide the primary basis to support the Technical Evaluation of a License Amendment Request (LAR). The OSA however may be utilized as part of the overall evaluation of staffing changes. The RIS states:

...an evaluation performed using only the guidance of NEI 10-05 does not satisfy the requirement to identify and evaluate changes to ERO augmentation timing or ERO augmentation staffing that reduces the capability to perform an emergency planning function.

In conjunction with this License Amendment Request, Byron validated the results of the OSA performed under 10 CFR 50, Appendix E, Section IV.A.9. The results are used to support the conclusions made in this License Amendment for on-shift staffing; however, Exelon understands the OSA comprises of a select set of identified scenarios and should not be used as the sole basis for the conclusions in the Technical Evaluation.

The Byron OSA is considered part of the station Emergency Plan and is maintained as an Addendum to the Emergency Plan Station Annex as EP-AA-1002, Addendum 1, Byron Station On-Shift Staffing Technical Basis, and has been docketed as part of Byron's Emergency Plan under this title.

3.0 TECHNICAL EVALUATION

The evaluation of the proposed changes is discussed below.

3.1 Technical Advancements and Support

The following section discusses technical changes in plant systems, procedures, EP equipment/programs and training which have been completed to better support ERO functions, ease operator burden and improve augmented staff efficiency. The following discussion describes the improvements implemented since the last revision of NUREG-0654 staffing guidance.

3.1.1 Plant Process Computer

The Plant Process Computer (PPC) system provides for the Safety Parameter Display System (SPDS) functions discussed below as well as data collection and processing, accounting, alarming and logging functions. An auxiliary function of the PPC is to transmit plant data to remote locations, including the TSC and the EOF.

The SPDS and the Plant Parameter Display System (PPDS) provide a concise display of critical plant variables to the MCR personnel to aid them in rapidly and reliably determining the safety status of the plant. The SPDS and PPDS are operated during normal plant operations, as well as during abnormal and emergency conditions. The principal purpose and function is to aid the MCR personnel during abnormal and emergency conditions in determining the safety status of the plant.

Parameters displayed by the SPDS and PPDS are the quantitative and qualitative measures to indicate the accomplishment or maintenance of critical safety functions. Information needed to assess the status of the plant safety parameters is obtained by the measurement of key plant variables. The safety parameters utilized to assess the maintenance or accomplishment of the critical safety functions as required by NUREG-0737, Supplement 1, Section 4 are:

1. Reactivity control
2. Reactor core cooling and heat removal
3. Reactor coolant system integrity
4. Containment conditions
5. Radiation control

In general, the ranges of parameters monitored by the SPDS and PPDS are identical to those ranges monitored by existing control room instrumentation. Ranges displayed by the SPDS/PPDS are adequate to cover plant responses analyzed in UFSAR Chapter 15, *"Accident Analysis."*

Benefits of the current level of computer capabilities include:

- Improved plant monitoring capability for emergency functions.
- Real time plant data available through graphical displays.
- PPC PI functions available to any desktop computer through the plant's site-wide network.
- Programming capability for automated response such as indication of critical parameter alarms.
- Easier interface when switching between graphical displays.

The PPC system replaced multiple older and obsolete systems with a single, microcomputer-based operating platform incorporating the SPDS and the PPDS as well as the following:

- Process Computer System
- Meteorological Data Acquisition System
- Sequence of Events Recorder (SER)
- Radiation monitoring
- Beacon Interface
- Digital rod position indication system (DRPI)
- RCS Leak Rate

By consolidating all of these systems onto a single platform, MCR personnel can quickly monitor all critical plant parameters from a single workstation. The following are some of the benefits of PPC:

- The Shift Manager has improved plant monitoring capability to support ED function.
- Workstations have the capability of being programmed for automated response (such as automatically indicating a critical parameter during events that may challenge that parameter).
- Data manipulation functions, such as plotting information graphically or recovering historical data, require fewer key strokes and are more easily performed.

- The SER function has become a "real-time" user tool by making data immediately available rather than being only available via printer after the event.
- Much of the PPC functionality can be made available to any desktop computer through the plant's site-wide intranet.
- The increased capabilities of PPC have enhanced timeliness of monitoring and assessing plant conditions.

In aggregate, these improvements support the proposed change in ERO staffing by ensuring that major functions and tasks are completed more easily with less burdens on the Control Room staff.

3.1.2 Dose Assessment

Radiological dose assessment has benefited from technological advances that make its use simpler and less time consuming. In the early 1990s Byron Station used the State of Illinois' DOS-based computer program *Mesorem*. *Mesorem* was a linear style program requiring the individual to answer a series of questions. It had limited capability to fix input errors without re-running a portion of the program.

Mesorem was replaced in 2002 with DAPAR, a Microsoft Access Data program developed internally by Exelon. DAPAR allowed the user to move within different input screens making changes as needed.

In 2012 DAPAR was replaced by Unified Rascal Interface (URI), a Visual Basic.net program. URI is a more efficient program utilizing menus, toolbars with the majority of inputs on a single screen making the program more user friendly. The plant display systems have improved over the years allowing access to more data points that are needed within dose assessment. Redundant Dose Assessment computers were installed as part of the implementation of cyber security requirements. Byron Station has an individual plant data screen dedicated to the needs of dose assessment inputs.

The overall improvements in technology and information availability over the years have enabled the on-shift staff to assess plant conditions quickly and efficiently, and with less distraction than before. The computing power of modern computer processors allow for calculation of dose projections that take seconds rather than minutes.

3.1.3 Automated Call-Out Systems

Enhancements in automated call-out and paging systems have resulted in streamlined processes for activation of the ERO. The ERO activation can occur through a Web based or phone based system to initiates rapid notification of ERO members in lieu of individual calls to fill the individual ERO positions included in today's Emergency Plan for Byron Station. The system includes a primary activation system as well as back-up capability to ensure uninterrupted operation.

3.1.4 Procedural Improvements

a. Emergency Operating Procedures (EOPs)

Since the original Emergency Plan approval, EOPs have been improved through industry initiatives. EOPs generally use a symptom-based approach that demands less assessment and interpretation of plant conditions by the crew. In addition, the EOPs are better human factored, and have an improved layout allowing for more consistent implementation.

EOPs interface well with new technology such as the PPC. The PPC system is capable of graphically displaying plant conditions to assist in EOP execution.

Abnormal Operating Procedures (AOPs) also contain directional steps for when a review of the classification procedure is required to determine potential classifiable conditions. This prompts the user to identify applicable EALs.

b. Emergency Action Levels

In 2016, Byron Station updated the classification methodology to that originally published in NEI 99-01, Revision 6, "*Development of Emergency Action Levels for Non-Passive Reactors.*" Byron Station's EALs incorporate the new guidance that has simplified the classification process, including the use of a matrix of EAL initiating conditions that streamlines the process of evaluating EAL against plant conditions.

3.1.5 Training

a. Operations Training

Training is used to strategically drive improved performance at Byron Station. Since NRC approval of the Byron Station Emergency Plan, the Systematic Approach to Training (SAT) has resulted in developing a task list for Operations personnel. The SAT process ensures training is conducted to industry-accepted standards, and has led to accreditation of the Operations Training Programs by the Institute of Nuclear Power Operations (INPO) National Academy for Nuclear Training.

A dynamic simulator is routinely used during Operations training. "As found" simulator evaluations that include emergency response scenarios are part of the requalification segment. Simulator scenarios are designed to be realistic and reflect a wide range of plant conditions, including emergency conditions. During the simulator evaluated sessions the control room staff is taken from normal operations to accident conditions resulting in the declaration of at least one event which can range from a Notice of Unusual Event (UE) up to a General Emergency (GE). The Operations crew performs critical functions, such as classification, core damage assessment, accident mitigation, response prioritization, and communications without augmentation from additional responders. The proficiency of the control room staff to perform these functions while maintaining situational awareness, without additional support is assessed during evaluated simulator sessions.

The Licensed Operator Requalification Training (LORT) Program includes licensed Operations crew performance evaluations that are to consider the scenario guidance attributes of INPO Operations Department Standing Instruction, ODSI-3, *"Operations Department Guidance."*

INPO ODSI 3, Operations Department Guidance for Conducting Crew Performance Evaluations, provides guidance on the realistic integration of the emergency response into crew performance evaluations. The purpose is to ensure the additional challenges the emergency plan responsibilities add to the crew's ability to manage an event are realistically represented in the crew performance evaluations. Representing the event as realistically as possible, which includes the additional challenges of emergency plan responsibilities, helps promote the situational awareness necessary during a real event.

b. Shift Technical Advisor (STA) Training

The STA was originally trained as an advisor to the operating shift per NUREG-0737, *"Clarification of TMI Action Plan Requirements."* In 2014, additional guidelines were developed by INPO for the training of STAs. This is detailed in the document ACAD 14-002, Guidelines for the Training and Qualification of the Shift Technical Advisor."

The ACAD 14-002 guidelines describe the role of the STA. The STA performs independent assessments of plant operating concerns, technical support, appropriate corrective actions, analysis of events and their effects, effectiveness of response(s) to emergent conditions, classifications of emergencies, protection of the public and any other actions related to critical safety functions and plant safety during abnormal and emergency situations. They also contribute to operations during normal plant conditions. By routine monitoring of equipment and plant operations, the STA can focus on preventative actions in order to mitigate the consequences of an accident.

3.1.6 Radiation Protection Improvements

There have been many improvements in RP since Byron's staffing was established under NUREG-0654, Revision 1 guidance.

The following provides a summation of the technology/tools associated with the in-plant protective actions:

a. Access Control

- Access to the Radiologically Controlled Area (RCA) is controlled electronically. The electronic access control system provides for the user to electronically sign Radiation Work Permits (RWPs) to self-authorize themselves to access the RCA and self-issuance of an electronic dosimeter (in addition to the assigned Dosimetry of Legal Record (DLR) that is always worn). Access to the RCA is controlled electronically without interface with a RP Technician (RPT).

b. Personnel monitoring

- Personnel are issued DLRs that are continuously worn for constant monitoring. No RPT support is needed for issuance of DLRs to on-shift emergency workers.
- Secondary dosimeters are issued through the electronic access control system. The secondary dosimeters are self-reading, alarming electronic dosimeters that provide readout of accumulated dose and ambient dose rate. No RPT support is needed for issuance of electronic dosimeters.
- Automated whole-body monitors provide contamination monitoring. All radiation workers are qualified to use the automated whole-body monitors without RPT interface.
- In circumstances when the automated whole-body monitors are not available, hand held friskers are used for personnel contamination monitoring. All radiation workers are qualified to use the hand-held friskers without RPT interface.

c. Dosimetry

- Personnel are issued DLRs that are continuously worn for constant monitoring.
- Secondary dosimeters are self-issued through the electronic access control system. The secondary dosimeters are self-reading, alarming electronic dosimeters that provide readout of accumulated dose and ambient dose rate. No RPT support is needed for issuance of electronic dosimeters.
- If a DLR is lost or damaged under emergency conditions, additional DLRs are staged for emergency issuance. Emergency issuance requires a DLR number and name of the person to who it is issued.
- If an electronic dosimeter is lost or damaged, additional electronic dosimeters are maintained in a fast-activation mode for immediate monitoring.

d. Area Radiation Monitors (ARMs) are also used and reviewed prior to dispatch of personnel into the plant. Byron has multiple ARMs throughout the plant.

Some RPT support functions associated with in-plant protective actions such as access control, personnel monitoring, dose assessment, and dosimetry now require less dedicated support time since they are covered by plant process enhancements (newer technology/tools).

These technology/tools use available equipment such as portal monitors, self-alarming dosimeters, and an automated access control point.

All onsite ERO members expected to be dispatched into the plant for evaluation, operations, or repair activities are Radiation Worker qualified and understand and are trained on how to use the available tools.

3.1.7 Improvements Summary

The improvements to staffing, equipment, procedures, and training that have occurred since initial approval of the Byron Station Emergency Plan have resulted in a significant increase in the on-shift capabilities and knowledge. Based on these improvements, it is concluded that there would be no significant degradation or loss of any functional task as a result of the proposed changes in ERO staffing.

3.2 Functional Analysis

This analysis evaluates the impact of implementing the changes in staffing on the ERO ability to perform the major tasks for the major functional areas of the Byron Station Emergency Plan. The analysis demonstrates that no degradation or loss of function would occur as a result of the change.

3.2.1 EP Function: Command and Control (formerly Emergency Direction and Control)

The Command and Control function includes the following tasks as defined in the draft NUREG-0654, Revision guidance:

- Provide overall ERO command and control, until relieved.
- Approve emergency action level (EAL) and/ or protective action recommendation (PAR) classifications, until relieved.
- Authorize personnel dose extensions, until relieved.

This function is important for effective emergency response because adequate Command and Control enables the Byron Station's ERO to effectively develop priorities for response planning and corrective action(s) and to provide a unified approach to the event response by providing a single individual with overall command and control authority. The function is staffed and maintained at all times and is assigned to the Operations Shift Manager (SM). The augmentation (relief) of this position is intended to relieve the SM of EP functions so that the SM can focus on the event response from an operations perspective. This occurs within 60 minutes of an Alert ECL declaration, or greater, and is a position staffed by the TSC Station ED. In addition, the EOF Corporate ED will take responsibility for those EP functions associated with PARs following activation of the EOF, also at the Alert or greater ECL.

- a. On-Shift Staff – The table below identifies the current, proposed, and draft NUREG-0654, Revision 2 guidance for this EP Function and proposed Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Command and Control – On-shift		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> (1)* Shift Manager/ Emergency Director <p>* may be performed by persons assigned other functions</p>	<ul style="list-style-type: none"> Shift Emergency Director 	<ul style="list-style-type: none"> Operations Shift Manager

Emergency Plan Change Assessment

Byron Station's existing on-shift staffing table currently aligns with the draft NUREG-0654, Revision 2 guidance with one exception. The current Byron Station Table 2-1 contains a note which states the MCR Shift ED position "*may be performed by persons assigned other functions.*" There are no additional functions assigned to the Shift ED other than what is annotated in the draft NUREG-0654, Revision 2 guidance and as such, the existing note is deemed unnecessary and is being removed from the Byron Station staffing table.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will maintain the existing title for this EP Function. The draft NUREG-0654, Revision 2 Operations Shift Manager will be titled Shift ED at Byron Station.

- b. Minimum Staff – The table below identifies the current and proposed Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Command and Control – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> (1) TSC Station Emergency Director (1) EOF Corporate Emergency Director 	<ul style="list-style-type: none"> (1) TSC Station Emergency Director (1) EOF Corporate Emergency Director 	<ul style="list-style-type: none"> (1) TSC Emergency Coordinator (at Alert or higher) (1) EOF Emergency Director (at SAE or higher)

The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. There is one difference between Byron Station's proposed Minimum Staff and the draft NUREG-0654, Revision 2 guidance. Specifically, Byron Station will

staff the EOF ED within 60 minutes of an Alert or higher ECL while the NUREG-0654 guidance staffs the position within 60 minutes of a SAE or higher ECL. This difference expands Byron Station’s emergency response at the Alert level and will ensure EOF ERO will be immediately available should an Alert classification escalate to a SAE or GE.

3.2.2 EP Function: Communications

The Communications function includes the following tasks as defined in the draft NUREG-0654, Revision 2 guidance:

- Communicate EAL and PAR classifications to offsite response organizations (OROs), including the NRC, until relieved.

This function is important for effective emergency response. The function ensures adequate communication onsite and offsite to successfully implement the emergency plans. Byron Station maintains the ability to staff this position at all times. This function is assigned to a pre-existing on-shift staff member as a collateral duty and has been assessed through an on-shift staffing analysis, via 10 CFR 50, Appendix E, Section IV.A.9, to ensure that this EP Function can be performed when needed without any additional competing priorities.

The augmentation (relief) of this position occurs within 60 minutes of an Alert ECL, or greater, and is intended to relieve the on-shift staff of this EP function. This function consists of two (2) ERO members to fulfill the communication needs (i.e., one (1) for the NRC and one (1) for State/local notification and status updates). Under the Byron Station Emergency Plan, additional communicators can be called upon as needed, and at the discretion of the ED.

- a. On-Shift Staff – The table below identifies the current and proposed Emergency Plan On-shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Communications – On-shift		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) Plant Personnel 	<ul style="list-style-type: none"> • (1) Shift Communicator 	<ul style="list-style-type: none"> • (1) Communicator¹ <p>¹ Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.</p>

Emergency Plan Change Assessment

There are no changes between the current Byron Station Emergency Plan staffing and the proposed changes to the Emergency Plan for the On-shift Communications function.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will keep the Shift Communication function consistent the draft NUREG-0654, Revision 2 guidance. The Shift Communicator will perform NRC and State/local communications as needed until relieved.

A difference identified related to the Byron Station implementation of the draft NUREG-0654 guidance is the absence of the note (1) regarding collateral duties. The notes states: *"Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time,"* and is not included in the Byron Station Emergency Plan. This note is not necessary because no collateral duties are assigned to the On-shift Communicator under the Byron Station Emergency Plan.

There are no other deviations from the draft NUREG-0654 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Communications – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) TSC ENS Communicator • (1) EOF State/local communicator • (1) EOF HPN Communicator • (1) TSC Director • (1) EOF Director 	<ul style="list-style-type: none"> • (1) TSC ENS Communicator • (1) EOF State/local Communicator <p>(additional communicators will be staffed as needed)</p>	<ul style="list-style-type: none"> • (1) TSC Communicator (NRC) • (1) TSC Communicator (ORO) • (1) EOF Communicator @ SAE ECL or greater <p>As needed (one communicator staffed at TSC for NRC communications if needed)</p>

Emergency Plan Change Assessment

Byron Station is maintaining the Minimum Staff TSC ENS and EOF State/local Communicator as currently described in the Byron Station Emergency Plan with no proposed changes to those positions. Additional Communications will be staffed at the EOF or TSC as needed.

The following positions, identified as minimum staff under the current Emergency Plan, are being re-categorized as Full-Augmented staff and managed within an EPIP.

EOF HPN Communicator - The EOF HPN Communicator identified in the current Emergency Plan is removed and relocated to an EPIP. Exelon is adding a statement to the staffing Table that additional communicators will be staffed as needed. This ensures that if required, additional NRC communicators can be augmented as necessary to support communications between Exelon and the NRC.

TSC Director – Under the Byron Station Emergency Plan, the TSC Director responsibilities do not directly perform actions necessary to accomplish EP functions under NUREG-0654, but rather support other personnel at the TSC. The position, as currently defined in the Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented). The TSC Director performs support activities such as supervisory actions, validations, liaison, assistance and monitoring activities. Specific responsibilities include:

- *Verify that qualified individuals are filling Communicator positions in the Control Room, TSC and OSC.*
- *Supervise the activities of the Logistics Coordinator and state/local Communicator.*
- *Ensure that communications are established with appropriate parties as directed by the Station Emergency Director.*
- *Ensure that all required notifications to offsite governmental agencies (state/local and NRC) are timely and accurate.*
- *Act as the Exelon Nuclear Liaison to any NRC Site Team Representatives.*
- *Ensure that the NRC Site Team Representatives are directed to their appropriate counterparts.*
- *Assist the Corporate Emergency Director in the acquisition of information for off-site agency updates.*

- *Record and relay inquiries to the Station Emergency Director. In addition, record responses to such inquiries prior to transmission.*
- *Assist the Station Emergency Director in maintaining proper records.*

Each of these tasks above are considered support activities and are not required to directly accomplish any of the NUREG-0654 identified functions. As such, the TSC Director position can be deleted from the Minimum Staff and maintained as a Full-Augmentation position. The TSC Director position and the listed responsibilities are being relocated to an EPIP.

EOF Director – Under the Byron Station Emergency Plan, the EOF Director responsibilities do not directly perform actions necessary to accomplish EP functions under NUREG-0654, but rather support other personnel at the EOF. The position, as currently described in the Byron Station Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented). The EOF Director performs support activities such as coordination, assessment, monitoring, and assistance activities. Specific responsibilities include:

- *Direct and coordinate the activation and response efforts of the EOF staff in support of the Corporate Emergency Director.*
- *Evaluate the need to augment the EOF staff based on events in progress.*
- *Assess the effectiveness of ongoing EOF working relationships.*
- *Monitor information flow within the EOF to ensure that facility activities remain coordinated.*
- *Prepare state/local notification forms with the assistance of the EOF Radiation Protection Manager and the Technical Support Manager. (task transferred to the State/local Communicator position)*
- *Coordinate services as necessary to support EOF operations.*
- *Coordinate with the Administrative Coordinator for continual shift staffing requirements.*
- *Assist in the conduct of Corporate Emergency Director duties.*
- *Act as the designated alternate for approval of the technical content of Exelon Nuclear Press Releases and information released to the News Media.*
- *Act as purchasing agent in support of the TSC for contract negotiation/administration.*

Note the responsibility to *"Prepare state/local notification forms with the assistance of the EOF Radiation Protection Manager and the Technical Support Manager,"* is relocated to the State/local Communicator position. Each of these other tasks above are considered support activities and are not required to directly accomplish any of the NUREG-0654 identified functions. As such, the EOF Director position can be deleted from the Minimum Staff and maintained as a Full-Augmentation position. The TSC Director position and the listed responsibilities are being relocated to an EPIP.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will maintain the ENS (NRC) Communicator and State/local (ORO) Communicators consistent with the draft NUREG-0654, Revision 2 guidance; however, the reporting location differs. Specifically, the function is maintained with one (1) ENS Communicator staffed at the TSC within 60 minutes to perform NRC communications and one (1) State/local Communicator at the EOF within 60 minutes to perform the State/local notifications with the Offsite Response Organizations (OROs).

The draft NUREG-0654, Revision 2 designates the minimum staff ORO communication (State/local) is located at the TSC. For Byron Station, the State/local Communicator is located in the EOF. This is acceptable because the Byron Station EOF is activated at the Alert or higher ECL. By establishing the EOF at the Alert level, the function would be available at the same time as if it were located in the TSC.

Additionally, the draft NUREG-0654, Revision 2, identified an EOF NRC communicator to be staffed within 60 minutes of an SAE or higher ECL. Exelon proposes to credit the TSC ENS communicator to provide information to the NRC in conjunction with the commitment to staff additional communicators as needed.

3.2.3 EP Function: Radiation Protection (formerly Radiological Assessment In-Plant Surveys and In Plant Protective Actions)

The RP function includes the following tasks as defined in draft NUREG-0654, Revision 2 guidance:

- Provide qualified radiation protection coverage for responders accessing potentially unknown radiological environments during emergency conditions.
- Provide in-plant surveys.
- Control dosimetry and radiologically controlled area access.

The ability to provide radiological expertise when the plant is experiencing an event with serious radiological consequences is crucial, due to the unknown radiological environment faced by emergency workers, particularly at the onset of the event. This function is staffed by two (2) qualified RP staff members on-shift.

Under Byron Station’s proposed ERO staffing and the draft NUREG-0654, Revision 2 guidance, the augmentation (support) of this position occurs in two (2) stages: 1) within 60 minutes of an Alert ECL or greater, three (3) additional qualified RP staff are available; and 2) within 90 minutes of an Alert ECL, or greater, an additional three (3) additional qualified RP staff are available, and both are staffed in the OSC. The total number of qualified RP staff for the ERO is eight (8) considering the on-shift and augmented staff.

The draft *"Technical Analysis in Support of the Guidance in NUREG-0654/FEMA-REP-1, SECTION II.B, Emergency Response Organization,"* for proposed Revision 2 states that: *"based upon staff review and approval of ERO staffing plans, and the evaluation of licensee exercises, the [NRC] staff has determined that expecting 2 qualified RP staff on-shift is reasonable for the increased time period (30 minutes to 60 minutes), at which point additional RP resources would become available, and that 3 additional RP staff in 60 minutes and 3 additional RP staff in 90 minutes is acceptable to ensure the staff can maintain its reasonable assurance finding (10 CFR 50.47(a)). In addition, the [NRC] staff has determined that field monitoring teams (FMTs) (onsite and offsite) can function with limited RP expertise while under the direct supervision of senior RP staff in the TSC or EOF, thus removing the need for a fully qualified RP staff member being a part of the FMT when their expertise is better suited supporting the ERO on-site."* The senior RP staff supervising the FMTs at Byron Station is responsible for directing the FMTs as well as providing direction for their safety from the radiological event.

In addition, the Chemistry/Rad Chemistry function listed in Table B-1 to Revision 1 of NUREG-0654, is no longer needed as the need for immediate reactor coolant sampling has been reduced due to the variety of plant indications of fuel damage available at Byron Station.

Overall, the ERO functions assigned to qualified RP staff are more clearly defined in Table B-1 to the draft NUREG-0654, Revision 2 guidance and support the reduction of the overall staffing levels for qualified RPs.

- a. On-Shift Staff – The table below identifies the current and proposed Emergency Plan On-Shift ERO, as well as the NUREG 0654, Rev 2 (draft) guidance for this EP Function.

EP Function: Radiation Protection – On-shift		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) RP Personnel (In-Plant Surveys) • (2)* RP Personnel (In-Plant Protective Actions) • (1) Chemistry Personnel <p>*may be performed by persons assigned other functions</p>	<ul style="list-style-type: none"> • (2) Radiation Protection Personnel 	<ul style="list-style-type: none"> • (2) Radiation Protection Personnel

Emergency Plan Change Assessment

Byron Station currently maintains two (2) RPTs on-shift to satisfy the Emergency Plan requirements. One (1) RPT is assigned to the In-Plant Surveys Task. Two (2) RPTs are assigned to the task of In-Plant Protective Actions; however, those tasks are considered collateral duties and the assigned RPTs may be assigned other functions (e.g., dose assessment). Byron Station will maintain two (2) RPTs on-shift; however, under the draft NUREG-0654, Revision 2 guidance, the RP tasks are combined such that the need to add the clarifying note regarding other functions is not necessary. As such, Table 2-1 is revised to show two (2) RPTs for this function, without the note which states the task may be performed by persons assigned other functions.

The proposed revision also removes the Chemistry personnel from Table 2-1. The Chemistry/Rad Chemistry function listed in Table B-1 to Revision 1 of NUREG-0654, is no longer needed as the need for immediate reactor coolant sampling has been reduced due to the variety of available plant indications of fuel damage available at Byron. Early indications of fuel damage can be identified through Containment Radiation Monitors, Core Exit Thermocouples, or Effluent Radiation Monitors, all of which are available in the MCR.

An on-shift staffing analysis under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that the Chemistry major task is not required per Byron Station's procedures prior to augmentation. The On-shift Staffing Assessment (OSA) indicates that the primary responsibility of the on-shift Chemistry technician is chemistry/radiochemistry sampling to identify fuel damage; however, no chemistry sampling tasks were noted as being time critical in any of the analyzed events.

Draft NUREG-0654, Revision 2 Alignment

The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the NUREG-0654 guidance. Byron Station will maintain two (2) RP personnel on-shift to perform the RP functions and tasks for protection coverage for responders, in-plant surveys, dosimetry and radiologically controlled area access. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Radiation Protection – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (2) RP Personnel (In-Plant Surveys) • (4) RP Personnel (In-Plant Protective Actions) • (1) Chemistry Personnel 	<ul style="list-style-type: none"> • (3) Additional RP Technicians @ 60 minutes (OSC) • (3) Additional RP Technicians @ 90 minutes (OSC) 	<ul style="list-style-type: none"> • Additional Radiation Protection Technicians @ 60 minutes (In addition to personnel on-shift) (3) (OSC) • Additional Radiation Protection Technicians @ 90 minutes (In addition to personnel on-shift and those responding within 60 min) (3) (OSC)

Emergency Plan Change Assessment

Currently, Byron Station designates six (6) Minimum Staff RPTs as required to support the EP Major Tasks of In-Plant Surveys and In-Plant Protective Actions at 60 minutes. Byron Station proposes to maintain six (6) Minimum Staff RPTs; however, consistent with the draft NUREG-0654, Revision 2 guidance, three (3) of those RPTs will respond within 90 minutes.

Technological advances in RP tasks (i.e, protection coverage for responders, in-plant surveys, dosimetry and radiologically controlled area access) support the additional time proposed in the draft NUREG-0654 guidance for the three (3) RPTs. This includes the availability of installed area, process, airborne and effluent radiation monitors, automated systems and information technology solutions supporting Radiation Work Permits (RWPs) and dosimetry issuance, and enhanced work processes that are available under accident conditions. Supporting tools and processes include portal monitors, self-alarming dosimeters, and automated access control system for the Radiologically Controlled Area (RCA) that maintain active radiation work permits (e.g., the system verifies qualifications, dose margins, and access requirements).

The proposed revision also removes the one (1) Minimum Staff Chemistry personnel from Table 2-1. The Chemistry/Rad Chemistry function listed in Table B-1 to Revision 1 of NUREG-0654, is no longer needed as the need for immediate reactor coolant sampling has been reduced due to the variety of available plant indications of fuel damage available at Byron. Early indications of fuel damage can be identified through Containment Radiation Monitors, Core Instrumentation, or Effluent Radiation Monitors, all of which are available in the MCR. If reactor sampling is desired, Chemistry Technicians are on staff at Byron and would be called in as necessary to support the event.

NUREG-0654, Revision 2 Alignment

Byron Station will staff three (3) additional RPTs at 60 minutes and three (3) more RPTs at 90 minutes in the OSC, consistent with the draft NUREG-0654, Revision 2 guidance. The augmented staff will perform the RP functions for protection coverage for responders, in-plant surveys, dosimetry and radiologically controlled area access. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

3.2.4 EP Function: Supervision of Radiation Protection Staff and Site Radiation Protection

The Supervision of Radiation Protection Staff and Site Radiation Protection Function include the following tasks as defined in the draft NUREG-0654, Revision 2 guidance:

- Evaluate and assess plant and offsite radiological data in the development of onsite protective actions and offsite PARs, until relieved.
- Recommend onsite protective actions and offsite PARs to the applicable decision-maker, until relieved.
- Direct all radiation protection activities, including FMT direction, until relieved.
- Provide relevant information to applicable communicators who are communicating offsite PARs to OROs, until relieved.

This function is important for effective emergency response to a radiological event because the management of RP resources, and the assistance this position provides the ED, is crucial for response to radiological events.

Radiological events can be very significant and constantly evolving, and require significant expertise in radiation and radiological consequences. The evaluation of radiological events, and the development of effective PARs, requires this expertise to support the ED in making these decisions.

This position is also responsible for the direction and protection of FMTs.

The augmentation (relief) of this function occurs within 60 minutes of an Alert ECL, or greater, and is staffed in the TSC. Also for Byron Station, at the Alert ECL, or greater, an EOF RP Manager position is staffed. Note that this position is primarily tasked with providing the applicable command and control position (i.e., Corporate ED) relevant expertise on radiological events. This will increase Byron Station's emergency response at the Alert ECL and will ensure EOF ERO will be immediately available should an Alert classification escalate to a SAE or GE.

- a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Supervision of Radiation Protection Staff and Site Radiation Protection – On-shift		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision Guidance
<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Shift Emergency Director (ED) 	<ul style="list-style-type: none"> • Operations Shift Manager

Emergency Plan Change Assessment

The current Byron Station Emergency Plan does not specifically identify this Function on-shift under Table 2-1. To align with the draft NUREG-0654 guidance, the Function is being added and assigned to the Shift ED. The tasks identified above align with current responsibilities for the Shift ED. An on-shift staffing analysis under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that the major tasks under this Function identified above can be performed when needed without any additional competing priorities.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will utilize the Shift ED on-shift to perform the *"Supervision of Radiation Protection Staff"* function until relieved by the augmented staff. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance. The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Supervision of Radiation Protection Staff and Site Radiation Protection – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) TSC Rad Protection Manager 	<ul style="list-style-type: none"> • (1) TSC Rad Protection Manager 	<ul style="list-style-type: none"> • (1) TSC Site Radiation Protection Coordinator

EP Function: Supervision of Radiation Protection Staff and Site Radiation Protection – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> (1) EOF Rad Protection Manager 	<ul style="list-style-type: none"> (1) EOF Rad Protection Manager 	<ul style="list-style-type: none"> (1) EOF Rad Protection Manager @ SAE ECL or greater

Emergency Plan Change Assessment

Byron will staff both the TSC RP Manager and the EOF RP Manager at 60 minutes from an Alert ECL consistent with current Emergency Plan commitments. There are no changes proposed to the current Emergency Plan for this Function.

Draft NUREG-0654, Revision 2 Alignment

The TSC RP Manager will perform site related duties which include actions to recommend onsite protective actions, to direct all radiation protection activities at the site, and to evaluate and assess plant radiological data in the development of onsite protective actions. The TSC RP Manager will also provide relevant information to applicable communicators who are communicating offsite PARs to OROs

The EOF RP Manager will perform duties which include actions to support evaluation of offsite radiological data in the development of onsite protective actions and offsite PARs, and to direct field monitoring teams at the Alert ECL, or greater.

Byron Station’s staffing of this Function is different than the draft NUREG-0654 guidance in that Byron Station staffs both the TSC RPM and the EOF RPM at 60 minutes from an Alert ECL. The draft NUREG-0654 guidance does not staff the EOF RP Manager until the SAE declaration.

This will increase Byron Station’s Emergency response at the Alert level and will ensure EOF RP Manager will be immediately available should an Alert classification escalate to a SAE or GE

The proposed ERO staffing activates the EOF earlier than the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

3.2.5 EP Function: Dose Assessments/Projections

The Dose Assessments/ Projections function includes the following tasks as defined in the draft NUREG-0654, Revision 2 guidance:

- Perform dose assessments/projections and provide input to applicable PAR decision-maker, until relieved.

This function is important for effective emergency response to a radiological event because timely dose assessments/projections ensure accurate and timely PARs can be developed, when necessary. Byron Station maintains the ability to staff this position at all times. This function is assigned to a pre-existing on-shift staff member as a collateral duty. An OSA under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that this EP function can be performed when needed without any additional competing priorities.

The augmentation (relief) of this function occurs within 60 minutes of an Alert ECL, or greater, and is staffed in the EOF.

Maintaining the ability to perform dose assessments/projections at all times ensures that the consequences of a radiological event, to the public, are effectively mitigated by providing timely dose related information to the Station ED (TSC) or Corporate ED (EOF) depending on which position is in command and control. As a result, this position (function) is expected to be available on-shift, in the TSC, and in the EOF depending on the ECL declared.

- On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Dose Assessments/Projections – On-shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) RP Personnel 	<ul style="list-style-type: none"> • Shift Dose Assessor ¹ ¹Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. 	<ul style="list-style-type: none"> • Dose Assessment / Projections Staff¹ ¹Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time

Emergency Plan Change Assessment

Byron Station currently utilizes on-shift RP personnel to perform the Dose Assessment Function prior to augmentation of the ERO. To align with the draft NUREG -0654, Revision 2 guidance, the Byron Station Emergency Plan is revised to annotate the Dose Assessment Function as the collateral duty and annotated with note (1) *"Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time."*

Draft NUREG-0654, Revision 2 Alignment

Byron Station will maintain a Shift Dose Assessor on-shift to perform dose assessments/projections and provide input to applicable PAR decision-maker functions. This function is performed by the on-shift RP technician under the current Emergency Plan and has been demonstrated successfully in drills and exercises. Additionally, an on-shift staffing analysis under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that the Dose Assessment function on shift can be performed by one of the two RP staff on shift without any additional competing priorities. The proposed ERO staffing for this Function is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Dose Assessments/Projections – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) EOF Dose Assessment Coordinator 	<ul style="list-style-type: none"> • (1) EOF Dose Assessment Coordinator 	<ul style="list-style-type: none"> • TSC (1) Dose Assessment/ Projection Staff • EOF (1) Dose Assessment / Projection Staff @ SAE or greater

Emergency Plan Change Assessment

Byron Station currently staffs one (1) Dose Assessment position at the EOF as Minimum Staff. The proposed revision to the Byron Station Emergency Plan maintains that commitment of one (1) Dose Assessment staff to be activated within

60 minutes of an Alert ECL or greater. There are no changes, other than position title, proposed for this EP Function.

Draft NUREG-0654, Revision 2 Alignment

Byron Station's proposed ERO staffing for the Dose Assessment Function is different than that in the draft NUREG-0654, Revision 2 guidance. Specifically, the draft guidance provides for one (1) Dose Assessment position to be staffed at the TSC within 60 minutes of an Alert ECL or higher. A second Dose Assessor is staffed at the EOF within 60 minutes of an SAE ECL or higher. Byron Station proposes to staff one (1) EOF Dose Assessor at 60 minutes from an Alert ECL or higher.

The draft NUREG-0654 guidance was developed with the premise that TSC is activated at the Alert ECL or higher and the EOF is activated at the SAE ECL or higher. While the Dose Assessment function falls more in line with the EOF responsibilities, it is not activated within the draft NUREG-0654 guidance until a SAE ECL or higher. In order to provide early relief of the on-shift Dose Assessment function for Alert ECLs, the guidance provides a TSC Dose Assessor, which is available at the Alert ECL.

The Byron Station EOF is staffed within 60 minutes of an Alert ECL or higher, making it unnecessary to staff the redundant TSC Dose Assessor. The EOF Dose Assessor Coordinator will perform duties which include actions to perform dose assessments/projections and provide input to applicable PAR decision-maker at the Alert ECL, or greater.

3.2.6 EP Function: Emergency Classifications

The Emergency Classifications function includes the following tasks as defined in the draft NUREG-0654, Revision 2 guidance:

- Evaluate plant conditions and recommend emergency classifications, until relieved.

This function is important to ensure a prompt and effective emergency response. Because the impetus for implementing the Emergency Plan is the determination of an EAL at the correct ECL, having this ability maintained at all times is essential. This function is assigned to a pre-existing on-shift staff member as a collateral duty. An OSA under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that this EP function is performed when needed without any additional competing priorities. The augmentation (relief) of this function occurs within 60 minutes of an Alert ECL, or greater, and is staffed in the TSC.

Maintaining the ability to perform this function at all times ensures that ECL decisions, and as applicable, the PAR decisions, are timely and accurate as these decisions have a direct relationship to public health and safety from the consequences of a radiological event. This function works in coordination with the ED in command and control, and as a result is available on-shift and in the TSC.

- a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Emergency Classifications – On-shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> None specified 	<ul style="list-style-type: none"> (1) Emergency Classification Advisor <p>Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.</p>	<ul style="list-style-type: none"> (1) Emergency Classification Advisor <p>Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.</p>

Emergency Plan Change Assessment

Byron Station’s Emergency Plan Table 2-1 does not currently specify a separate Emergency Classification Function for the on-shift staff. Byron Station proposes to revise Emergency Plan Table 2-1 to align with the draft NUREG-0654, Revision 2 guidance. This function is assigned to a pre-existing on-shift staff member as a collateral duty (e.g., STA). The STA has the experience and training to fill this position and the responsibilities for monitoring plant operation are consistent with the EP position responsibilities. Additionally, an OSA under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that this EP function is performed when needed without any additional competing priorities.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will maintain an Emergency Classification Advisor on-shift to evaluate plant conditions and recommend emergency classifications. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Emergency Classifications – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • None specified 	<ul style="list-style-type: none"> • TSC (1) Emergency Classification Advisor 	<ul style="list-style-type: none"> • TSC (1) Emergency Classification Advisor

Emergency Plan Change Assessment

Byron Station's current Emergency Plan does not specifically identify a Classification Advisor on Table 2-1. Byron proposes to utilize the Operations Manager to support EAL Classification. Byron Station proposes to revise the Emergency Plan Table 2-1 to include the Emergency Classification Function and assign the TSC Operations Manager or other qualified individual to support and advise the non-delegable responsibility of EAL Classification. The Operations Manager under the Emergency Plan has the necessary background, experience and training to fill this position.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will staff a TSC Operations Manager at 60 minutes to evaluate plant conditions and recommend emergency classifications. The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

3.2.7 EP Function: Engineering

The Engineering function includes the following tasks as defined in the draft NUREG-0654, Revision 2 guidance:

- Provide engineering coverage related to the specific discipline of the assigned engineer, until relieved. Specifically:
 - An engineer to monitor and evaluate changing core/thermal hydraulic issues is important to effective emergency response because monitoring and evaluating core conditions, or thermal hydraulic conditions of the reactor coolant system, can support timely corrective action(s), ECL declarations, and subsequent PARs. Radiological events from a power reactor come from damage to an operating reactor core, or the systems used to cool the core, and engineering expertise in this area can greatly benefit the licensee's response. This function is assigned to a pre-existing on-shift staff member as a collateral duty. An OSA under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that this EP function is performed when needed without any additional

competing priorities. The augmentation (relief) of this function occurs within 60 minutes of an Alert ECL, or greater, and is staffed in the TSC.

- An engineer to provide expertise in Electrical/Instrumentation and Control (I&C) systems and equipment supports the evaluation of these systems/equipment and supports the development of repair plans if necessary. The augmentation (support) of this function occurs within 60-minutes of an Alert ECL, or greater, and is staffed in the TSC.
- An engineer to provide expertise in mechanical systems and equipment supports the evaluation of these systems/equipment and supports the development of repair plans if necessary. The augmentation (support) of this function occurs within 60-minutes of an Alert ECL, or greater, and is staffed in the TSC.

a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Engineering – On-shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) Shift Technical Advisor/Incident Advisor (IA) 	<ul style="list-style-type: none"> • (1) STA/IA Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. 	<ul style="list-style-type: none"> • (1) Core/Thermal Hydraulics Engineer Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.

Emergency Plan Change Assessment

The current Byron Station Emergency Plan utilizes the STA to satisfy the on-shift responsibilities for the Plant System Engineering, Repair, and Corrective Actions Function (Major Tasks: Technical Support).

Under the new guidance, the EP function is re-categorized as the Engineering Function. The Byron Station Emergency Plan is revised to identify the Engineering Function is a collateral duty satisfied by the STA on-shift. An OSA under 10 CFR 50,

Appendix E, Section IV.A.9 was performed to ensure that this EP function is performed when needed without any additional competing priorities.

Draft NUREG-0654, Revision 2 Alignment

Byron will maintain STA on-shift to perform the Core/Thermal Hydraulics Engineer function as a collateral duty. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance and the proposed revision to the Byron Station Emergency Plan.

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Engineering – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) Core Thermal/Hydraulic Engineer • (1) Mechanical Engineer • (1) Electrical Engineer • (1) TSC Technical Manager • (1) SAMG Decision Maker (May be provided by other personnel assigned other functions.) • (2) SAMG Evaluator (May be provided by other personnel assigned other functions.) 	<ul style="list-style-type: none"> • (1) Core / Thermal Hydraulics Engineer • (1) Mechanical Engineer • (1) Electrical / Instrumentation & Controls Engineer 	<ul style="list-style-type: none"> • (1) Core / Thermal Hydraulic Engineer • (1) Mechanical Engineer • (1) Electrical / Instrumentation and Control (I&C) Engineer

Emergency Plan Change Assessment

Byron Station's Emergency Plan currently identifies a Minimum Staff of one (1) Core Thermal/Hydraulic Engineer, one (1) Mechanical Engineer and one (1) Electrical Engineer consistent with the draft NUREG-0654, Revision 2 guidance. These positions will continue as Minimum Staff in the proposed Byron Station Emergency Plan Table 2-1.

The following positions, currently identified as Minimum Staff under the Byron Station Emergency Plan, are being re-categorized as Full-Augmented staff and managed within an EPIP.

TSC Technical Manager – Under the Byron Station Emergency Plan, the TSC Technical Manager responsibilities do not directly perform actions necessary to accomplish EP functions under NUREG-0654 guidance, but rather support other personnel at the TSC. The position, as currently defined in the Byron Station Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented). The TSC Technical Manager performs support activities such as supervisory actions, evaluations, coordination, assistance and monitoring activities). Specific responsibilities include:

- *Accumulate, tabulate and evaluate data on plant conditions.*
- *Evaluate plant parameters during an emergency to determine the overall plant condition.*
- *Coordinate core damage assessment activities.*
- *Identify data points and control parameters that the Operations staff should monitor.*
- *Ensure that current and adequate technical information is depicted on status boards.*
- *Identify and direct staff in the development of special procedures needed to effect long-term safe shutdown or to mitigate a release.*
- *Supervise the total onsite technical staff effort.*
- *Act as the TSC liaison with state and appropriate NRC Site Team representatives.*
- *Assist the Radiation Protection Manager for onsite radiological/technical matters.*

- *Assist the Station Emergency Director in evaluating plant based PARs (prior to Corporate Emergency Director accepting command and control) and changes in event classification.*
- *Supervise the activities of the TSC Technical Communicator.*
- *Assume the duties and responsibilities of an Evaluator when transition to Severe Accident Management Guidelines (SAMG) is initiated and supervise the activities of the SAMG Evaluator Team*

Each of these tasks above are considered support activities and are not required to directly accomplish any of the NUREG-0654 guidance identified functions. As such, the TSC Technical Manager position can be deleted from the Minimum Staff and maintained as a Full-Augmentation position. The TSC Technical Manager position and the listed responsibilities are being relocated to an EPIP.

SAMG Decision Maker / Two (2) SAMG Evaluators

In 1985, the NRC issued its policy on Severe Reactor Accidents Regarding Future Designs and Existing Plants (50 FR 32138). In mid-1988, the NRC staff formulated a program plan for the integration and closure of severe accident issues. NEI 91-04 Severe Accident Issue Closure Guidelines provides guidelines in the closure of the severe accident issues on a plant specific basis.

As a result, Exelon implemented severe accident management guidance (SAMG) for accidents. Guidance was developed for use by ERO personnel in assessing plant damage, planning and prioritizing response actions, and implementing strategies that delineate actions inside and outside the control room. Strategies and guidance were interfaced with the EOPs and Emergency Plans.

When plant conditions warrant entry into the Severe Accident Management Guidelines (SAMGs), the Station ED or other qualified individual (e.g., Operations Manager) assumes the role of Decision-Maker. The Technical Manager and/or another qualified individual(s) assumes the role of Evaluator (at least two (2) are required), and the Main Control Room (MCR) staff assumes the role of Implementers.

Under the Byron Station Emergency Plan, the TSC SAMG Decision-Maker and Evaluator responsibilities do not directly perform actions necessary to accomplish EP functions under the NUREG-0654 guidance. The position, as currently defined in the Byron Station Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented).

As such, the TSC SAMG Decision-Maker and SAMG Evaluator positions can be deleted from the Minimum Staff Table 5-1. Byron will continue to describe the SAMG interface in the Emergency Plan and maintain its existing commitments for the program.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will staff a Core Thermal/Hydraulic Engineer, a Mechanical Engineer, and an Electrical Engineer at 60 minutes to provide engineering coverage related to their specific discipline. The TSC SAMG Decision-Maker and SAMG Evaluator positions, as well as the TSC Tech Manager position are not identified in the draft NUREG-0654, Revision 2 guidance. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance. The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

3.2.8 EP Function: Security

Byron Station’s Security Force is controlled and maintained by the NRC-approved Physical Security Plan (PSP) and is not reflected in the Emergency Plan. However, the establishment of a Security Supervisor position in the TSC is advantageous to ensure effective coordination between the security force and the ERO, particularly for events where offsite resources are necessary as well as for security related events and site personnel accountability. The augmentation (support) of this function occurs within 60 minutes of an Alert ECL, or greater, and is staffed by a Security Supervisor in the TSC to coordinate security-related activities with that of the ERO. The command and control staff of the TSC all respond within 60 minutes of an Alert ECL, or greater, to ensure that the ED has access to the resources and expertise of the site staff in order to develop response plans for a wide-spectrum of events.

- a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Security – On-shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • Per the Security Plan 	<ul style="list-style-type: none"> • Security staffing per the site-specific security plan 	<ul style="list-style-type: none"> • Security staffing per the site-specific security plan

Emergency Plan Change Assessment

There are no changes between the current Byron Station Emergency Plan staffing and the proposed changes to the Emergency Plan for the On-shift Security function.

Draft NUREG-0654, Revision 2 Alignment

There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance. The proposed ERO staffing is consistent with the draft NUREG-0654,

Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Security – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> Per the Security Plan 	<ul style="list-style-type: none"> (1) TSC Security Coordinator 	<ul style="list-style-type: none"> (1) TSC Security Liaison

Emergency Plan Change Assessment

Byron Station is revising the Emergency Plan to re-categorize the Full-Augmentation TSC Security Coordinator position as Minimum Staff. The addition of Minimum Staff position ensures timely and effective coordination between the security force and the ERO, particularly for events where offsite resources are necessary as well as for security related events and site personnel accountability.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will staff a TSC Security Coordinator at 60 minutes to be a liaison to the Security Force. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance.

The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

3.2.9 EP Function: Repair Team Activities

The NRC has determined that, from an EP perspective, the ability to get Emergency Core Cooling System (ECCS) equipment operational was the primary basis for necessitating maintenance expertise while on-shift. Byron Station’s ECCSs are designed to be redundant and diverse such that common mode failures are very unlikely. From the Byron Station UFSAR:

The primary function of the ECCS is to remove the stored and fission product decay heat from the reactor core during accident conditions.

The ECCS consists of the centrifugal charging, safety injection and residual heat removal pumps, accumulators, RHR heat exchangers and the refueling water

storage tank, along with the associated piping, valves, instrumentation and other related equipment.

Reliability of the ECCS is considered in all aspects of the system from initial design to periodic testing of the components during plant operation. The ECCS is a two-train, fully redundant, engineered safety feature. The system has been designed and proven by analysis to withstand any single credible active failure during injection, or active or passive failure during recirculation and maintain the performance objectives desired...

As a result of the redundant and diverse design, the need to accommodate maintenance functionality on-shift is unnecessary. Nevertheless, a minimum number of maintenance personnel are assigned to respond to an event as part of the ERO, with more personnel available on an as-needed basis depending on the event.

The augmentation (support) of the electrician and mechanic positions occur within 60 minutes of an Alert ECL, (or greater), and is staffed in the OSC. The augmentation (support) of the I&C position occurs within 90 minutes of an Alert ECL, or greater, and is staffed in the OSC. The OSC is the emergency response facility associated with maintenance tasks, as directed by the command and control staff in the TSC.

- a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Repair Team Activities – On-shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • Mechanical Maintenance (May be provided by other personnel assigned other functions.) • Electrical/I&C Maintenance (May be provided by other personnel assigned other functions.) 	<ul style="list-style-type: none"> • Operations Staff <p>Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.</p>	<ul style="list-style-type: none"> • Operations Staff <p>Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.</p>

Emergency Plan Change Assessment

Byron Station’s current Emergency Plan allows the Repair Activities Function to be performed as a collateral duty by plant Operators. The proposed revision utilizes the language from the draft NUREG-0654, Revision 2 guidance; however, adopting the

guidance from the draft NUREG to utilize Operations staff to perform this EP function does not change with this revision.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will maintain plant Operators on-shift to perform the actions necessary to run the ECCS systems and perform minor maintenance activities. The ECCS systems at Byron Station are diverse and redundant such that Maintenance technicians are not required on-shift. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Repair Team Activities – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (2) Mechanical Maintenance (OSC) • (3) Electrical/I&C Maintenance (OSC) 	<ul style="list-style-type: none"> • (1) OSC Mechanical Maintenance Technician • (1) OSC Electrical Maintenance Technician • (1) OSC I&C Technician @ 90 minutes <p>Additional Mechanical and Electrical Maintenance Techs as needed.</p>	<ul style="list-style-type: none"> • (1) Mechanic (OSC) • (1) Electrician (OSC) • (1) I&C Technician @ 90 minutes • Additional Mechanical and Electrical Maintenance Techs as needed.

Emergency Plan Change Assessment

Byron Station's current Emergency Plan provides for two (2) Mechanical Maintenance technicians and three (3) Electrical/I&C technicians to the OSC at 60 minutes. Byron is revising the Maintenance response consistent with the draft NUREG-0654 guidance, which provides for one (1) technician from each discipline to be staffed as Minimum Staff. Additional technicians are available and would be called as needed depending on the nature of the emergency repairs needed. Byron Station has a proven Work Management program that has demonstrated the ability to respond to emergent work activity issues during off hours, weekends and holidays. In an emergency situation, the Minimum Staff OSC responders from each Maintenance discipline would be available to assess the required work activities,

begin preparation activities, and request the needed support in a timely manner. The proposed staffing is consistent with the draft NUREG-0654, Revision 2 guidance and provides the necessary personnel to respond to the emergency condition.

Draft NUREG-0654, Revision 2 Alignment

Byron Station will staff one (1) Mechanical and one (1) Electrical Maintenance technician at 60 minutes to perform the maintenance activities from the OSC to respond to the emergency condition. An I&C technician will respond within 90 minutes consistent with the draft NUREG-0654 guidance. Depending on the need, additional maintenance technicians will be called in to support the OSC activities. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance.

3.2.10 EP Function: Supervision of Repair Team Activities

The ability to effectively supervise repair team personnel during emergency response is important. The augmentation (support) of these functions is as follows:

- A Lead OSC Supervisor (OSC Director) is staffed within 60 minutes of an Alert ECL, (or greater), and is staffed in the OSC.
- An Electrical Supervisor, a Mechanical Supervisor, an I&C Supervisor, and an RP Supervisor is staffed within 90 minutes of an SAE ECL, or greater, and is staffed in the OSC.

The OSC Director can effectively manage the maintenance resources for the additional 30-minutes prior to the specific craft (mechanical, electrical, or I&C) respond, as demonstrated through drills and exercises.

- a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Supervision of Repair Team Activities – On-shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • None Specified 	<ul style="list-style-type: none"> • (1) Repair Team Supervisor Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. 	<ul style="list-style-type: none"> • (1) Repair Team Supervisor Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.

Emergency Plan Change Assessment

Byron Station does not currently have an ERO on-shift position for the Repair Team Supervisor. Byron Station proposes to add the collateral duty of Repair Team Supervisor to the Emergency Plan Table 2-1. Operators fulfill the requirements for on-shift Maintenance, so the Operations Shift Supervisor would maintain the supervision of the operators in this capacity. An on-shift staffing analysis under 10 CFR 50, Appendix E, Section IV.A.9 was performed to ensure that the Supervision of Maintenance personnel function can be performed when needed by an Operations Shift Supervisor without any additional competing priorities.

Draft NUREG-0654, Revision 2 Alignment

There are no differences or deviations from the NUREG-0654, Revision 2 guidance. The proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

- b. Minimum Staff – The table below identifies the current and proposed Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Supervision of Repair Team Activities – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) OSC Director • (1) Maintenance Manager (TSC) 	<ul style="list-style-type: none"> • (1) OSC Director • (1) Electrical Maintenance Supervisor/Lead @ 90 mins (OSC) • (1) Mechanical Maintenance Supervisor/Lead @ 90 mins (OSC) • (1) I&C Supervisor/Lead @ 90 mins (OSC) • (1) RP Supervisor/Lead @ 90 mins (OSC) 	<ul style="list-style-type: none"> • (1) Lead OSC Supervisor • (1) Electrical Supervisor @ 90 mins • (1) Mechanical Supervisor @ 90 mins • (1) I&C Supervisor @ 90 mins • (1) Radiation Protection Supervisor @ 90 mins

Emergency Plan Change Assessment

Byron Station's current Emergency Plan Table 2-1 identifies the Supervisory positions of OSC Director and TSC Maintenance Manager under the Major Task of Repair and Corrective Actions. The OSC Director effectively manages the maintenance resources upon activation of the facility.

Byron Station is adding four (4) Minimum Staff positions to the OSC to be staffed at 90 minutes. These include an Electrical Maintenance Supervisor/Lead Technician, a Mechanical Maintenance Supervisor/Lead Technician, an I&C Supervisor/Lead Technician, and a RP Supervisor/Lead Technician. The addition of the four (4) supervisor positions enhances the ERO response by putting in place effective supervision repair team personnel early in the emergency response.

TSC Maintenance Manager - The Maintenance Manager is being re-categorized from Minimum Staff to Full-Augmentation Staff. Under the Byron Station Emergency Plan, the TSC Maintenance Manager responsibilities do not directly perform actions necessary to accomplish EP functions under NUREG-0654, but rather support other personnel at the TSC. The position, as currently defined in the Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented). The TSC Technical Manager performs support activities such as supervisory actions, validations, coordination, and assistance activities). Specific responsibilities include:

- *Direct the total onsite maintenance and equipment restoration effort.*
- *Request additional equipment in order to expedite recovery and restoration.*
- *Supervise the activities of the OSC Director and the TSC Damage Control Communicator.*
- *Ensure the Operations Manager is informed of OSC staffing utilization and activities.*
- *In coordination with the Operations Manager, determine the priority assigned to OSC activities.*
- *Ensure adequate staffing of the OSC.*
- *Assist in rescue operations.*
- *Identify required procedures that need to be written or implemented in support of the response efforts.*

Each of these tasks above are considered support activities and are not required to directly accomplish any of the NUREG-0654 identified functions. As such, the TSC Maintenance Manager position can be deleted from the Minimum Staff and maintained as a Full-Augmentation position. The TSC Maintenance Manager position and the listed responsibilities are being relocated to an EPIP.

Draft NUREG-0654, Revision 2 Alignment

Under Byron Station's proposed Emergency Plan staffing, the OSC Director position is staffed within 60 minutes to oversee the activation of the OSC facility and the maintenance craft as they arrive. The Mechanical, Electrical, I&C, and RP Supervisors/Lead Technician staff at 90 minutes to support coordination and supervision of repair team activities.

Byron Station proposes one difference to the draft NUREG 0654, Revision 2 guidance. Specifically, Byron Station proposes to allow a Maintenance or RP Lead Technician to fill the supervisory role at 90 minutes. Under the Exelon Maintenance and RP programs, Lead technicians are qualified, experienced craft technicians who successfully demonstrate the day-to-day leadership of the technician work force and act as lead on back shifts. Duties and responsibilities include training and development of other employees in performing preventive maintenance and routine equipment service activities. Basic qualifications for a Lead technician include demonstrated reliability and responsibility and the ability to make quick and effective technical decisions, as well as demonstrated situational leadership, environmental and safety stewardship. The experience and qualification of Byron Station's Lead technicians satisfy the requirements and the needs of the OSC for the Supervision of Repair Team Activities EP Function.

Other than the difference discussed above, the proposed ERO staffing is consistent with the draft NUREG-0654, Revision 2 guidance. The assigned major tasks are aligned with those stated in the draft NUREG-0654 guidance.

3.2.11 EP Function: Field Monitoring Teams

The ability to locate, monitor, and track a radioactive plume is important to ensure appropriate protective measures are taken in response to a radiological event. The ability to staff these teams before they may be needed (i.e., before a radiological release) greatly enhances the ability to provide timely and accurate PARs.

The augmentation (support) for these teams is as follows:

- Onsite Field Monitoring

An Onsite Field Monitoring person is staffed consisting of one person to monitor radiation. This onsite position is responsible for radiological monitoring of the site's PA. The size and configuration of the Byron Station PA does not support the need of an accompanying driver. The protected area can be easily and

efficiently traversed without use of a vehicle. This RP person is staffed within 60 minutes of an Alert ECL, or greater.

The Onsite Field Monitor is qualified to assess radiation and contamination levels, but is not necessarily an ANSI-qualified RP technician since the person is under the direct supervision of RP Manager in the TSC. Note, the Onsite Field Monitor would not be staffed if the radiological conditions jeopardize the safety of the Onsite Field Monitor.

- Offsite Field Monitoring

An Offsite FMT is staffed, consisting of a Monitor and a driver, within 60 minutes of an Alert ECL, or greater. This offsite FMT is responsible for locating, monitoring, and tracking a radioactive plume, as well as obtaining environmental samples as necessary (e.g., air, water, vegetation, etc.). The Monitor is qualified to assess radiation and contamination levels, but need not be an ANSI-qualified RP technician as long as the FMT is under the direct supervision of senior staff in the TSC or EOF.

Another offsite FMT is staffed, consisting of a monitor and a driver, within 90 minutes of an Alert ECL, or greater. This offsite FMT is also responsible for locating, monitoring, and tracking a radioactive plume, as well as obtaining environmental samples (e.g., air, water, vegetation, etc.).

The Monitor is qualified to assess radiation and contamination levels, but need not be an ANSI-qualified RP technician as long as the FMT is under the direct supervision of senior staff in the TSC or EOF.

- a. On-Shift Staff – There are no on-shift staff assigned to this EP Function. This is consistent with the draft NUREG-0654, Revision 2 guidance.

EP Function: Field Monitoring Teams – On Shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
N/A	N/A	N/A

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Field Monitoring Teams – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (2) Onsite Field Team Personnel • (4) Offsite Field Team Personnel • (1) EOF Environmental Coordinator 	<ul style="list-style-type: none"> • Onsite Field Monitoring Individual (Qualified Individual) • Offsite Field Monitoring Team A (1 Qualified Individual and 1 Driver) • Offsite Field Monitoring Team B @ 90 mins (1 Qualified Individual and 1 Driver) 	<ul style="list-style-type: none"> • Onsite Field Monitoring Team (1 Qualified Individual and 1 Driver) • Offsite Field Monitoring Team A (1 Qualified Individual and 1 Driver) • Offsite Field Monitoring Team B @ 90 mins (1 Qualified Individual and 1 Driver)

Emergency Plan Change Assessment

Onsite Field Monitoring - The current Byron Station Emergency Plan designates two (2) RP personnel as Minimum Staff for the EP function of Onsite Surveys. The proposed revision the Byron Station Emergency Plan designates one (1) RP person for onsite surveys. The number of RP personnel for this function is consistent with the draft NUREG-0654, Revision 2 guidance. Note there is a difference with respect to the designated onsite Field Monitoring Team Driver (discussed below). The reduction in RP personnel to this task is acceptable because one (1) Field Monitor dedicated to monitor and survey the site area is sufficient to provide current and timely data to the TSC/EOF in emergency conditions. At Exelon stations, the onsite Field Monitor is responsible only for monitoring the Protected Area. The size of the Station's Protected Area allows traverse in minutes and a second RP Field Monitor would not be required to perform this function. The monitoring equipment is hand-held and does not require two personnel for transport or operation. The Owner Controlled Area has an infrastructure that supports vehicular traffic and will be monitored by the Offsite Field Monitoring Teams. This is the current Exelon process and has been demonstrated successfully through drills and exercises at Exelon stations.

Offsite Field Monitoring Teams - The Offsite FMTs at Byron Station currently consist of two (2) Field Teams, each staffing at 60 minutes and consisting of a driver and one (1) RP personnel. Byron Station proposes to change the Offsite FMTs to be consistent with the draft NUREG- 0654, Revision 2 guidance. Specifically, there would be two (2) FMTs, but one (1) Team would staff at 90 minutes instead of 60

minutes. An additional 30 minutes in response is acceptable in that this second FMT is a backup to the first FMT, and while both FMTs are expected to respond to an event to better coordinate radioactive plume tracking action(s), allowing for an additional 30 minutes provides some flexibility in staffing this ERO function without compromising the reasonable assurance finding in accordance with 10 CFR 50.47(a).

EOF Environmental Coordinator - The EOF Environmental Coordinator is being re-categorized from Minimum Staff to Full-Augmentation Staff. Under the Byron Station Emergency Plan, the EOF Environmental Coordinator responsibilities do not directly perform actions necessary to accomplish EP functions under NUREG-0654, but rather support other personnel at the TSC. The position, as currently defined in the Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the Emergency Plan (i.e., if any position or function is not staffed then the Emergency Plan may not be effectively implemented). The EOF Environmental Coordinator performs support activities such as coordination, communication, monitoring, and assistance activities. Specific responsibilities include:

- *Coordinate the transfer of control of the Field Monitoring Teams if initially under the direction of the TSC Radiological Controls Coordinator.*
- *Ensure communications are established with the TSC to obtain information on the accident conditions, meteorological conditions and estimates of radioactive material releases.*
- *Maintain cognizance of Field Monitoring Team exposure. When warranted, ask the Dose Assessment Coordinator to initiate an evaluation of the need for administering KI to Exelon nuclear workers.*
- *Determine needs of the Dose Assessment Coordinator, the Dose Assessor, the HPN Communicator and the State Environs Communicator(s) for updates on Field Monitoring Team data and ensure distribution of new data to them in accordance with those needs. (task transferred to EOF RPM)*
- *Upon request, provide environmental data to Emergency Public Information personnel.*
- *Evaluate and coordinate additional equipment and personnel as necessary from unaffected stations to augment and/or relieve station Field Monitoring Teams.*

Each of these tasks above are considered support activities and are not required to directly accomplish any of the NUREG-0654 identified functions. As such, the EOF Environmental Coordinator position can be deleted from the Minimum Staff and maintained as a Full-Augmentation position. The EOF Environmental Coordinator position and the listed responsibilities are being relocated to an EPIP.

Draft NUREG-0654, Revision 2 Alignment

The proposed ERO staffing for Onsite Field Monitoring is different than that proposed in the draft NUREG-0654, Revision 2 guidance. Specifically, for the Byron Station, Onsite Field Monitoring will be staffed without a designated driver. At Exelon stations, the onsite Field Monitor is responsible only for monitoring the area within the Protected Area. The size of the Station's Protected Area allows traverse of foot in minutes and a designated driver would not be required to perform this function. The Protected Area is sized to allow efficient traverse without the use of a vehicle. The monitoring equipment is hand-held and does not require a vehicle for transport. Additionally, the Protected Area does not have an infrastructure which readily supports vehicle transportation.

For Exelon stations, the Owner Controlled Area supports vehicular traffic and is the responsibility of one of the Offsite Field Monitoring Teams. This has been demonstrated successfully through drills and exercises at Exelon stations.

The 60-minute and 90-minute Offsite FMTs will staff consistent with the draft NUREG-0654, Revision 2 guidance. There are no differences or deviations from the draft NUREG-0654, Revision 2 guidance for the Offsite FMTs.

3.2.12 EP Function: Media Information

The Media Information function includes the following tasks:

- Manage and coordinate media information related to the event.

Media relations is an important part of effective emergency response and is consistent with the National Incident Management System (NIMS). Revision 1 of NUREG-0654 left the exact staffing composition flexible, with input from applicable OROs, and from the Federal Emergency Management Agency (FEMA).

The augmentation (support) of this function is defined for Byron Station to be that which is absolutely needed to support this function, i.e., without those positions this function could not occur.

Byron Station is supported through the Exelon Communications Department at all times. The Communications Department responds to media inquiries initially for any ECL. The Communications Department coordinates with Exelon Management and ERFs to respond to media inquiries. Press releases are issued as appropriate from the Communications Department.

Within 90 minutes of an Alert ECL or higher, the Byron Station Emergency Plan is revised to describe the positions of Corporate Spokesperson, Public Information Director, and Joint Information Center (JIC) Director as those necessary to support the additional media related tasks associated with the more significant classifications. These tasks include periodic press briefings, media engagement, and coordination with State and local Emergency Management Agencies.

- a. On-Shift Staff – There are no on-shift staff assigned to this EP Function; however, the Exelon Communications Department are available to address media inquiries 24 hours/day. This is consistent with the draft NUREG-0654, Revision 2 guidance.

EP Function: Media Information – On Shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
N/A	N/A	N/A

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG0-0654, Revision 2 guidance for this EP Function.

EP Function: Media Information – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> • (1) Corporate Spokesperson (Min Staffing time not specified) • (1) Public Information Director (Min Staffing time not specified) • (1) JIC Director (Min Staffing time not specified) 	<ul style="list-style-type: none"> • (1) Corporate Spokesperson (established @ 90 min of an Alert or higher ECL) • (1) Public Information Director (Does not need to be performed in the JIC, but needs to be established @ 90 min of an Alert or higher ECL) • (1) JIC Director (established @ 90 min of an Alert or higher ECL) 	<ul style="list-style-type: none"> • JIC/JIS staff to address media inquiries at the Alert ECL • Staff to perform JIC/JIS related tasks at SAE ECL or greater

Emergency Plan Change Assessment

Byron Station’s current Emergency Plan identifies three (3) Minimum Staff positions to be staffed following an Alert ECL to address the Media Information EP Function.

The positions report to the Joint Information Center (JIC). The positions consist of the Corporate Spokesperson, Public Information Director, and JIC Director. Byron Station's Emergency Plan, in contrast to other Minimum Staff positions, does not specify an activation time requirement. Byron Station's proposed Emergency Plan revision maintains the three (3) JIC positions; however, the response time is being revised to activate within 90 minutes of an Alert ECL or higher. The revision to the Emergency Plan adds a specific facility Activation time of 90 minutes from an Alert ECL or higher. Byron Station's Corporate Communications Department is capable of responding to and addressing events prior to the arrival of the JIC Minimum Staff at 90 minutes of an Alert ECL or higher.

Draft NUREG-0654, Revision 2 Alignment

The proposed ERO staffing activates the JIC at a lower ECL than the draft NUREG-0654, Revision 2 guidance. Exelon proposes to activate the JIC within 90 minutes of an Alert ECL or higher. The 90-minute activation time provides for a larger population of candidates to fill the JIC minimum staff positions and is offset to some degree by the activation of the JIC at a lower ECL than stipulated in the draft guidance. The Exelon Communications Department is will provide for the JIC functions until the JIC is activated and turnover of responsibility occurs.

Byron Station will staff a Corporate Spokesperson at the JIC to maintain command and control of the JIC and conduct periodic briefings with the news media. The JIC Director is staffed at the JIC to coordinate with the State, local and Federal agencies to maintain factual consistency of information conveyed. Byron Station will also staff a Public Information Director to oversee the issuance of news releases and media monitoring/rumor control. The Public Information Director function may be performed remotely by taking advantage of advancements in communication technology.

3.2.13 EP Function: Information Technology

The Information Technology (IT) function includes the following tasks:

- If emergency plan functions rely on computer-based equipment, provide IT support.

The ever-increasing advances in technology have led to significant enhancements in many areas of emergency response, such as communications, monitoring, displays, digital procedures, etc. Byron Station has assessed the use of this technology as it is used to enhance the ability to protect the health and safety of the public with respect to EP.

- a. On-Shift Staff – There are no on-shift staff assigned to this EP Function; however, the Exelon IT department maintains a 24 hour/day HELP desk to assist users with IT related issues.

EP Function: Information Technology – On Shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
N/A	N/A	N/A

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Information Technology – Minimum Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
<ul style="list-style-type: none"> Not Applicable 	<ul style="list-style-type: none"> (1) EOF/JIC Computer Specialist (@ 90 min from Alert) Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. 	<ul style="list-style-type: none"> (1) EOF/JIC/JIS IT Lead @ SAE ECL or greater Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. (1) TSC IT Lead @ 90 mins Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time.

Emergency Plan Change Assessment

Byron Station's current Emergency Plan does not identify IT positions as Minimum Staff. Byron maintains a Computer Specialist position at the EOF as a Full Augmentation position. Performance of digital equipment at EOF and TSC has shown to be acceptable during drills and Exercises with this staffing. With the built-in redundancy for communication systems and digital EP assets, Byron has not identified a need to maintain an IT Lead (Computer Specialist) as a Minimum Staff position at the TSC facility. The EOF Computer Specialist is revised to Minimum Staff with a response time of 90 min from the Alert or higher classification.

Draft NUREG-0654, Revision 2 Alignment

Byron proposes to staff an IT Lead at the EOF as Min Staff, however Byron proposes to staff the position within 90 minutes of an Alert rather than 60 minutes of a Site Area Emergency. Byron does not propose to staff an IT Lead position as minimum staff at the TSC. The draft NUREG 0654, Rev 2, Guidance states:

IT staff is only required to be described in the emergency plan if the emergency response is reliant on IT equipment to the extent where failure of IT equipment would prevent the effective implementation of the emergency plan. In other words, if the failure of IT equipment prevents the effective implementation of the emergency plan (i.e., redundant methods/options are unavailable or not timely), then this EP function should be developed as described.

Byron's EOF and TSC contain multiple computers and programs in the facility which support EP functions. This includes Plant Parameter Display Systems, Core Damage Assessment and Dose Assessment programs, as well as Web EOC, fax and copy machines. Performance during drills and exercises indicates consistent performance of the digital assets in the facilities. The communications, dose assessment and core damage assessment equipment is periodically tested and issues, if any identified, are promptly addressed. The facilities and respective digital equipment are frequently used through administration of training for each team, as well as drills and Exercises. Additionally, Exelon maintains an IT HELP Desk 24 hours per day, 7 days a week. Many computer issues can be addressed remotely with an IT specialist at the HELP desk. If additional help is needed at the TSC, the EOF IT Specialist will be available to support resolution of the issue.

In addition, each of these EP related digital assets in the TSC and EOF were evaluated as part of implementation of the Cyber Security Rule, 10 CFR 73.54(b). Under NEI 13-10, "Cyber Security Control Assessments," EP Critical Digital Assets at the TSC and EOF have been assessed and controls have been put in place to protect the assets against cyber-attack. In conjunction with these controls, alternate administrative, non-digital, or adequately independent means have been put in place for performing each EP function, should the digital component or program fail for any reason. For example, both the Core Damage Assessment program and the Dose Assessment programs have a redundant, non-network laptop computer at their respective facility to maintain the EP function should the designated computer fail.

ERO position procedures have written instructions for backup communication measures should the primary means fail.

Finally, performance of digital assets is monitored through either the Corrective Action Programs or the EP Drill and Exercise critique process. Performance trends are monitored and corrective actions are implemented as necessary.

3.2.14 EP Function: Resource Allocation and Administration

- a. On-Shift Staff – There are no on-shift staff assigned to this EP Function; however, the Exelon IT department maintains a 24 hour/day HELP desk to assist users with IT related issues.

EP Function: Resource Allocation and Administration – On Shift Staff		
Current Emergency Plan, Table 2-1	Proposed Emergency Plan, Table 2-1	Draft NUREG-0654, Revision 2 Guidance
N/A	N/A	N/A

- b. Minimum Staff – The table below identifies the current and proposed Byron Station Emergency Plan ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: Resource Allocation and Administration – Minimum Staff	
Current	Proposed
<ul style="list-style-type: none"> (1) EOF Logistics Manager 	<ul style="list-style-type: none"> Manage positions under Emergency Plan Implementing Procedures (EPIP)

Emergency Plan Change Assessment

Logistics Manager - The Logistics Manager is being re-categorized from Minimum Staff to Full Augmentation Staff. Under the Byron Emergency Plan, the EOF Logistics Manager responsibilities do not directly perform actions necessary to accomplish EP functions under NUREG-0654, but rather support other personnel at the TSC. The position, as currently defined in the Emergency Plan, would not be considered as part of the absolute minimum ERO needed to implement the emergency plan (i.e., if any position or function is not staffed then the emergency plan may not be effectively implemented). The EOF Logistics Manager performs support activities such as monitoring, advising, validations, coordination, and assistance activities). Specific responsibilities include:

- Ensure contact is made and communications are maintained with appropriate Non-Exelon Nuclear personnel whose assistance may be required to terminate the emergency conditions and to expedite the recovery.
- Advise the EOF Director concerning the status of activities relating to governmental interfaces.
- Obtain support from Human Resources, the Comptroller's Office, the Legal Department, Accounting Department and others as required.
- Coordinate with the Nuclear Duty Officer to maintain communications with ANI and INPO.
- Ensure that access to the EOF is limited to Emergency Responders and authorize admittance to non-Exelon personnel.
- Implement the Exelon Nuclear Fitness for Duty Program.
- Ensure that NRC Site Team Representatives are directed to the Regulatory Liaison upon arrival at the EOF.
- Ensure that updates and information are provided to the EOC Liaisons and to offsite officials present in the EOF.
- Assist in obtaining and coordinating additional equipment/materials and /or technical expertise to support station requests, including Exelon Corporate staff, unaffected stations and vendor/contractors.
- Coordinate maintenance of EOF equipment as necessary.
- Ensure shift relief and continual staffing for the EOF.

Each of these tasks above are considered support activities and are not required to directly accomplish any of the NUREG-0654 identified functions. As such, the EOF Logistics Manager position can be deleted from the Minimum Staff and maintained as a Full-Augmentation position. The EOF Logistics Manager position and the listed responsibilities are being relocated to an EPIP.

Draft NUREG-0654, Revision 2 Alignment

The Resource Allocation and Administration EP Function does not exist in the draft NUREG-0654, Revision 2 guidance. Removing the Logistics Manager and re-categorizing the position as Full-Augmentation is consistent with the draft NUREG-0654, Revision 2 guidance.

3.2.15 EP Function: First Aid and Rescue Operations

The First Aid and Rescue Operations EP Function no longer exists in the draft NUREG-0654, Revision 2 guidance.

- a. On-Shift Staff – The table below identifies the current and proposed Byron Station Emergency Plan On-Shift ERO, as well as the draft NUREG-0654, Revision 2 guidance for this EP Function.

EP Function: First Aid and Rescue Operations – On-shift Staff	
Current	Proposed
<ul style="list-style-type: none"> (2) First Aid and Rescue Operations personnel (May be performed by personnel assigned other functions) 	<ul style="list-style-type: none"> Not Applicable

Emergency Plan Change Assessment

The Byron Station Emergency Plan identifies two (2) persons fulfilling the EP Function of First Aid and Rescue Operations as collateral duties. Byron Station utilizes Operators and/or RPTs to satisfy this responsibility. First Aid and Rescue is no longer identified as an EP Function under the draft NUREG-0654, Revision 2 Table B-1 guidance. First Aid is still maintained as part of the draft NUREG-0654 Revision 2, guidance under Section II.L, "Planning Standard for Medical and Public Health Support." As such, Byron Station will continue to maintain qualified First Aid and Rescue personnel on shift; however, the personnel resources are no longer listed on the Emergency Plan Table 2-1, "Staffing Table," consistent with the NUREG-0654 guidance.

Draft NUREG-0654, Revision 2 Alignment

The First Aid and Rescue Operations EP Function does not exist in the draft NUREG-0654, Revision 2 Table B-1 guidance. So, removing the Function from the Emergency Plan is consistent with the draft NUREG-0654, Revision 2 guidance.

- b. Minimum Staff – There are no ERO resources assigned to First Aid and Rescue Operations under the current Byron Station Emergency Plan. Additionally, the First Aid and Rescue Operations EP Function does not exist in the draft NUREG-0654, Revision 2 guidance. No revision is required to the Byron Station Emergency Plan.

3.3 Full-Augmentation Staff Assessment

The table below identifies the current Byron Station Emergency Plan, Table 2-1 Full-Augmentation ERO for each of the EP Functions. These positions are removed from the Emergency Plan and are either relocated to an EPIP or re-categorized as Minimum Staff, as annotated below.

EP Function: Communications – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) TSC State/local Communicator • (1) EOF ENS Communicator • (1) TSC HPN Communicator • (2) Ops Communicator • (1) EOF Ops Advisor • (3) Damage Control Communicator • (1) TSC Technical Communicator • (1) EOF Technical Advisor • (1) EOF State Environs Communicator (Personnel numbers depend on the type and extent of the emergency.) • (1) EOC Communicator • (1) State EOC Liaison (Personnel numbers depend on the type and extent of the emergency.) • (1) County EOC Liaison (Personnel numbers depend on the type and extent of the emergency.) • (1) Regulatory Liaison 	<p>Manage positions under Emergency Plan Implementing Procedures (EPIP)</p>
EP Function: Radiation Protection – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • RP Personnel (In-Plant Surveys) - Personnel numbers depend on the type and extent of the emergency. • RP Personnel (In-Plant Protective Actions) - Personnel numbers depend on the type and extent of the emergency. • Chemistry Personnel - Personnel numbers depend on the type and extent of the emergency 	<ul style="list-style-type: none"> • Manage positions under Emergency Plan Implementing Procedures (EPIP)

EP Function: Dose Assessments/Projections – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) EOF Dose Assessor • (1) TSC Radiation Controls Coordinator 	<ul style="list-style-type: none"> • Manage positions under Emergency Plan Implementing Procedures (EPIP)
EP Function: Engineering – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) TSC Radiation Controls Engineer • (1) EOF Tech Support Manager 	<ul style="list-style-type: none"> • Manage positions under Emergency Plan Implementing Procedures (EPIP)
EP Function: Security – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) TSC Security Coordinator • (1) EOF Security Coordinator 	<ul style="list-style-type: none"> • TSC Security Coordinator changed to Minimum Staff • EOF Security Coordinator to be managed under Emergency Plan Implementing Procedures (EPIP)
EP Function: Repair Team Activities – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • Mechanical Maintenance (Personnel numbers depend on the type and extent of the emergency.) • Electrical/I&C Maintenance (Personnel numbers depend on the type and extent of the emergency.) 	Byron will identify the additional maintenance personnel available to support the Emergency Condition under the Emergency Plan Table 2-1.
EP Function: Supervision of Repair Team Activities – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) Assistant OSC Director • Ops Lead and Support Personnel 	<ul style="list-style-type: none"> • Manage positions under Emergency Plan Implementing

(Personnel numbers depend on the type and extent of the emergency.)	Procedures (EPIP)
EP Function: Field Monitoring Teams – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) Field Team Communicator • Additional Offsite Field Monitoring Teams (Personnel numbers depend on the type and extent of the emergency.) • Additional Onsite Field Monitoring Teams (Personnel numbers depend on the type and extent of the emergency.) 	<ul style="list-style-type: none"> • Manage positions under Emergency Plan Implementing Procedures (EPIP)
EP Function: Media Information – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> • (1) Rad Protection Spokesperson • (1) Technical Spokesperson • (1) News Writer • (1) Media Monitoring Staff (Personnel numbers depend on the type and extent of the emergency.) • (1) Rumor Control Staff (Personnel numbers depend on the type and extent of the emergency.) • (1) JIC Coordinator • (1) Administrative Coordinator • (1) Access Controls • Facility Support Staff (Personnel numbers depend on the type and extent of the emergency.) 	<ul style="list-style-type: none"> • Manage positions under Emergency Plan Implementing Procedures (EPIP)
EP Function: Information Technology – Full-Augmentation Staff	
Current	Proposed

<ul style="list-style-type: none"> (1) EOF Computer Specialist 	<ul style="list-style-type: none"> EOF Computer Specialist changed to Min Staff (@ 90 minutes from Alert or higher)
EP Function: Resource Allocation and Administration – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> (1) TSC Logistics Coordinator (1) EOF Administrative Coordinator (2) Events Recorders (JIC/EOF) Clerical Staff (TSC/EOF/JIC) (Personnel numbers depend on the type and extent of the emergency) 	<ul style="list-style-type: none"> Manage positions under Emergency Plan Implementing Procedures (EPIP)
EP Function: First Aid and Rescue Operations – Full-Augmentation Staff	
Current	Proposed
<ul style="list-style-type: none"> First Aid and Rescue Operations (Personnel numbers depend on the type and extent of the emergency.) 	<ul style="list-style-type: none"> Manage positions under Emergency Plan Implementing Procedures (EPIP)

Neither NUREG-0654, Revision 1 or the draft Revision 2 document discuss Full-Augmentation positions under Table B-1. In the draft Revision 2, Table B-1, Note iii addresses the required minimum staffing as compared to other staff not critical to the effective Emergency Plan implementation. Note iii states:

iii. The minimum ERO staffing plan is that which is required to effectively implement the site-specific emergency plan (i.e., the emergency plan cannot be effectively implemented without this staff). The emergency plan should describe the minimum ERO staffing plan, while supporting implementing procedures can describe any other staff response desired by the licensee as long as this staff is not critical to effective emergency plan implementation. The augmentation times listed are intended to provide a model for applicants and licensees to consider in the development of their site-specific emergency plan.

The intent of this note is to emphasize the distinction between ERO minimum staffing and ERO members who serve in a supporting capacity.

The Byron Station Emergency Plan describes the Minimum Staff ERO that is the absolute minimum needed to implement the station's Emergency Plan (i.e., if any

position or function is not staffed, then the Emergency Plan cannot be effectively implemented). Byron Station utilizes additional Full-Augmentation ERO staff that are trained, qualified, and available to ensure all available licensee resources are used when a radiological emergency occurs and to provide for staff relief on a 24-hour / 7-day a week extended basis. The Full-Augmentation staff performs support functions such as intra-facility communications, organization liaisons, and expert advisors. This description of the additional Full-Augmentation ERO staff is being relocated from Byron Station's Emergency Plan to an EPIP.

The Byron Station Emergency Plan shall be effectively implemented utilizing the Minimum Staff positions. However, most Full-Augmentation Staff will still be assigned ERO teams, be expected to maintain Fitness-for-Duty during duty weeks, and be notified to respond to their ERF at the Alert or higher ECL. Their presence will not be required however to activate the respective ERFs.

The complete list of Full-Augmented Staff relocated from the Byron Station Emergency Plan, along with their respective EP tasks is listed in Enclosure 7 of this submittal. Each EP task assigned under the Emergency Plan is further evaluated and dispositioned in this Enclosure.

3.4 **Other Changes to the Emergency Plan**

3.4.1 **Command and Control Turnover**

The Exelon Standardized Radiological Emergency Plan EP-AA-1000, Part II, Sections B.3 and B.4 are being revised to reflect the changes to the Command and Control Turnover description. With the proposed changes in ERO, the description of the turnover process is revised to describe the transfer of non-delegable duties for PARs and State/local notifications directly from the MCR to the EOF. Note that under the current Emergency Plan, the MCR has the option to transfer PAR and State/local notification responsibilities to directly to the EOF or to the TSC on an interim basis should the EOF be unavailable. The section of the Emergency Plan is revised to no longer describe the capability to transfer PARs and State/local notifications to the TSC on an interim basis. The revision will have no impact on timeliness or resources since the EOF and TSC are both staffed within 60 minutes of declaration and will continue to have staff available to perform the functions. The Command and Control turnover of responsibilities between the MCR, TSC and EOF will occur concurrently on a bridge line without delay.

3.5 **Impact of Proposed Changes on State Emergency Plan**

3.5.1 **Potential Impact of ERO Changes on Off-Site Emergency Response Organizational Interfaces**

Exelon provided a draft copy of the License Amendment Request to representatives from the Illinois Emergency Management Agency (IEMA) to ensure the revision had no adverse impact on the ability of State and local response organizations to effectively implement their FEMA-approved RERP plans.

IEMA provided a letter dated January 9, 2018 stating IEMA completed its initial review of a draft copy of the License Amendment Request. The objective of the review was to identify any potential impacts off-site emergency preparedness and response. IEMA concluded that based upon the review of the document and proposed changes, there is no basis for denial of approval. IEMA concurs and recommends approval of the LAR. See Enclosure 9 "Information Related to Review of Proposed Changes by the States of Illinois and Iowa" for a copy of the referenced correspondence.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The proposed change has been evaluated to determine whether applicable regulations and requirements continue to be met.

Section 50.47, "Emergency Plans," of Title 10 of the *Code of Federal Regulations* (10 CFR) sets forth the U.S. Nuclear Regulatory Commission's (NRC) emergency plan requirements for nuclear power plant facilities. The regulation in 10 CFR 50.47(a)(1)(i) states, in part:

...no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Section 50.47(b) establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Planning Standard (2) of this section requires that:

On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.

Section IV.A of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states:

The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for notification of such individuals in the event of an emergency. Specifically, the following shall be included:

1. A description of the normal plant operating organization.
2. A description of the onsite emergency response organization (ERO) with a detailed discussion of:
 - a. Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;
 - b. Plant staff emergency assignments;
 - c. Authorities, responsibilities, and duties of an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.
3. A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.
4. Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.
5. Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.
6. A description of the local offsite services to be provided in support of the licensee's emergency organization.
7. By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, "hostile action" is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.
8. Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.
9. By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that

would prevent the timely performance of their assigned functions as specified in the emergency plan.

Revision 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," dated November 1980, was intended to aid licensees, applicants for licenses, or State and local emergency response organizations in the development of their Radiological Emergency Response Plans. The NRC endorsed this document for use in this effort via Revision 2 to Regulatory Guide (RG) 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," dated October 1981. RG 1.101 allowed for licensees to submit alternatives to the guidance provided in NUREG-0654/FEMA-REP-1 for staff review and approval if necessary.

Section II.B of NUREG-0654/FEMA-REP-1, Revision 1, states, in part:

On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.

Evaluation Criteria 5 of Section II.B of NUREG-0654/FEMA-REP-1, Revision 1, states, in part:

Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1.

10 CFR 50.54(q) establishes requirements that all holders of a nuclear power reactor operating license must follow and maintain in effect emergency plans which meet the planning standards in 10 CFR 50.47(b) and the requirements in 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." 10 CFR 50.47 of 10 CFR, "Emergency plans," sets forth emergency plan requirements for nuclear power plant facilities.

NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," provides guidance and acceptance criteria to provide a basis for NRC licensees, State and local governments to develop radiological emergency plans and improve emergency preparedness.

Regulatory Guide 1.219, "*Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors*," provides guidance related to emergency preparedness and specifically to making changes to emergency response plans.

NRC Regulatory Issue Summary (RIS) 2005-02, Revision 1, "*Clarifying the Process for Making Emergency Plan Changes*," which provides guidance to (1) clarify the meaning of a "decrease in effectiveness," as stated in 10 CFR 50.54(q); (2) clarify the process for evaluating proposed changes to emergency plans; (3) provide a method for evaluating proposed changes to emergency plans; and (4) provide clarifying guidance on the appropriate content and format of applications submitted to the NRC for approval prior to implementation.

NSIR/DPR-ISG-01, "*Interim Staff Guidance, Emergency Planning for Nuclear Power Plants*," provides guidance for addressing emergency planning requirements for nuclear power plants. This guidance is based on changes to Emergency preparedness regulations 10 CFR 50.47 and 10 CFR 50 Appendix E, that were published in the Federal Register (FR) on November 23, 2011 (i.e., reference 76FR 72560). The guidance should be used by licensees and applicants for implementing changes to onsite EP programs based on the revised emergency preparedness requirements and by NRC for reviewing the adequacy of the revised onsite emergency preparedness programs.

In addition, Exelon also reviewed draft NUREG-0654, Revision 2 (NUREG-0654/FEMA-REP-1, Revision 2), "*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*," dated May 2015 and draft RIS 201X-XX, "*License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation*" (ML15338A291) in support of this submittal.

Exelon has evaluated the proposed changes against the applicable regulatory requirements and guidance criteria. The proposed Byron Station Emergency Plan changes continue to assure that regulatory requirements and emergency planning standards associated with emergency response are met.

4.2 Precedent

There is no industry precedent for licensees implementing changes based on the NUREG-0654, Revision 2 (draft) guidance; however, there have been other ERO staffing amendments approved by the NRC within the last few years. Specifically, on March 14, 2017 the NRC approved Southern Nuclear Operating Company's License Amendment Request to standardize the Emergency Plans for the Joseph M. Farley Nuclear Plant, Edwin I. Hatch Nuclear Plant, and Vogtle Electric Generating Plant stations which included changes to the ERO staffing (ML16141A109). Regarding Exelon stations, a revision to the Three Mile Island Emergency Plan related to ERO Staffing was approved by the NRC on June 23, 2017 (ML17137A393).

4.3 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, "*Application for amendment of license, construction permit, or early site permit,*" Exelon Generation Company, LLC (Exelon) requests amendments to the following licenses:

- NPF-37 and NPF-66 – Byron Station, Units 1 and 2, respectively

The requested amendments to the licenses support changes to the Byron Station Emergency Plan based upon completion of a supporting evaluation of onsite Emergency Response Organization (ERO) staffing. The revision will align the Exelon nuclear stations minimum staff ERO with the draft NUREG-0654/FEMA-REP-1, "*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,*" Revision 2 guidance.

The proposed changes have been reviewed considering the applicable requirements of 10 CFR 50.47, 10 CFR 50 Appendix E, and other applicable NRC guidance criteria. Exelon has evaluated the proposed changes to the Byron Station Emergency Plan and determined that the changes do not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three (3) standards, set forth in 10 CFR 50.92, "*Issuance of amendment,*" is provided below.

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes to the Byron Station Emergency Plan do not increase the probability or consequences of an accident. The proposed changes do not impact the function of plant Structures, Systems, or Components (SSCs). The proposed changes do not affect accident initiators or accident precursors, nor do the changes alter design assumptions. The proposed changes do not alter or prevent the ability of the onsite ERO to perform their intended functions to mitigate the consequences of an accident or event. The proposed changes remove ERO positions no longer credited or considered necessary in support of Emergency Plan implementation.

Therefore, the proposed changes to the Byron Station Emergency Plan do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes have no impact on the design, function, or operation of any plant SSCs. The proposed changes do not affect plant equipment or accident analyses. The proposed changes do not involve a physical alteration of the plant

(i.e., no new or different type of equipment will be installed), a change in the method of plant operation, or new operator actions. The proposed changes do not introduce failure modes that could result in a new accident, and the proposed changes do not alter assumptions made in the safety analysis. The proposed changes remove ERO positions no longer credited or considered necessary in support of Emergency Plan implementation.

Therefore, the proposed changes to the Byron Station Emergency Plan do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

Margin of safety is associated with confidence in the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public.

The proposed changes do not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analyses. There are no changes being made to safety analysis assumptions, safety limits, or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes. Margins of safety are unaffected by the proposed changes to the ERO staffing.

The proposed changes are associated with the Byron Station Emergency Plan staffing and do not impact operation of the plant or its response to transients or accidents. The proposed changes do not affect the Technical Specifications. The proposed changes do not involve a change in the method of plant operation, and no accident analyses will be affected by the proposed changes. Safety analysis acceptance criteria are not affected by these proposed changes. The proposed changes to the Emergency Plan will continue to provide the necessary onsite ERO response staff.

Therefore, the proposed changes to the Byron Station Emergency Plan do not involve a significant reduction in a margin of safety.

4.4 Conclusions

In conclusion, based on the considerations discussed above: 1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 2) such activities will be conducted in compliance with the Commission's regulations, and 3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

In accordance with 10 CFR 51, the following information is provided in support of a finding that the proposed changes do not have significant effect on the quality of the human environment.

Pursuant to 10 CFR 50.90, Exelon Generation Company, LLC (Exelon) has requested amendments to the licenses for Braidwood Station Units 1 and 2, Byron Station Units 1 and 2, Clinton Power Station Unit 1, Dresden Nuclear Power Station Units 1, 2 and 3, LaSalle County Station Units 1 and 2, and Quad Cities Nuclear Power Station Units 1 and 2.

Specifically, the proposed changes would revise certain Emergency Response Organization (ERO) positions to align with the minimum staff ERO guidance specified in draft Revision 2 of NUREG-0654/FEMA-REP-1, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."*

The proposed changes will also relocate the identified Full-Augmentation ERO positions specified in Table 2-1, *"Minimum Staff Requirements,"* of each affected station's Emergency Plan Table 2-1, *"Minimum Staff Requirements,"* to an Emergency Preparedness Implementing Procedure (EPIP).

The proposed changes have been reviewed considering the requirements of 10 CFR 50.47, *"Emergency plans,"* paragraph (b), 10 CFR 50 Appendix E, *"Emergency Planning and Preparedness for Production and Utilization Facilities,"* and other applicable emergency preparedness NRC guidance documents. An evaluation of the proposed changes pursuant to 10 CFR 50.54, *"Conditions of licenses,"* paragraph (q), *"Emergency plans,"* determined that the proposed changes result in a reduction in effectiveness of the Emergency Plans for the affected facilities and, therefore, require prior NRC approval.

Exelon has determined that the proposed changes do not individually or cumulatively have a significant effect on the human environment. The proposed changes update the licensing basis for the affected plants related to ERO staffing consistent with guidance in draft Revision 2 of NUREG-0654. The associated changes to the ERO staffing will not affect the quality of the human environment.

As described above, Exelon has determined that operation of the subject facilities in accordance with the proposed changes does not involve a significant hazards consideration, in that it does not: 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety.

Exelon has determined that operation of the affected facilities in accordance with the proposed changes does not authorize a significant change in the types or a significant increase in the amounts of any effluent that may be released offsite. The proposed changes are unrelated to any aspects of plant construction or operation that would introduce any changes to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, or other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, these changes do not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation.

Exelon has determined that operation of the affected facilities in accordance with the proposed changes does not result in a significant increase in individual or cumulative occupational radiation exposure. The proposed changes will not affect how a structure, system, or component will be used to meet the design bases of the nuclear plant. The proposed changes will have no effect on the construction or operation of the nuclear plants and, therefore, would not introduce any changes to the amount of occupational radiation exposure.

In conclusion, Exelon has operational effects of the proposed amendment do not involve 1) a significant hazards consideration, 2) a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or 3) a significant increase in the individual or cumulative occupational radiation exposure. Consequently, the proposed changes will not have a significant effect on the quality of the human environment.

6.0 REFERENCES

- 6.1 NSIR/DPR-ISG-01, *"Interim Staff Guidance, Emergency Planning for Nuclear Power Plants,"* Revision 0, November 2011.
- 6.2 NEI 10-05, Revision 0, *"Assessment of On-Shift Emergency Response Organization Staffing and Capabilities,"* dated June 2011.
- 6.3 NUREG-0654/FEMA-REP-1, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,"* Revision 1, U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, Washington, DC, November 1980.
- 6.4 10 CFR 50.47, *"Emergency plans."*
- 6.5 10 CFR 50, Appendix E, *"Emergency Planning and Preparedness for Production and Utilization Facilities."*
- 6.6 Regulatory Issue Summary 2005-02, Revision 1, *"Clarifying the Process for Making Emergency Plan Changes,"* dated April 19, 2011.
- 6.7 Regulatory Guide 1.219, *"Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors,"* dated November 2011.