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RS-20-130

10 CFR 50.90
10 CFR 50.54(q)

November 2, 2020

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

Byron Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454, STN 50-455 and 72-068

Subject: License Amendment Request – Proposed Changes to Byron Emergency Plan for Post-Shutdown and Permanently Defueled Condition

Reference: Letter from J. Bradley Fewell (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations for Byron Station, Units 1 and 2," dated September 2, 2020 (NRC Accession No. ML20246G613)

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 Renewed Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2 (Byron). The proposed amendment would revise the Site Emergency Plan (SEP) for the post-shutdown and permanently defueled condition. The proposed changes are being submitted to the NRC for approval prior to implementation, as required under 10 CFR 50.54(q)(4).

By letter dated September 2, 2020 (Reference 1), Exelon provided formal notification to the U.S. Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.4(b)(8) and 10 CFR 50.82(a)(1)(i) that it would permanently cease operations at Byron on or before September 30, 2021.

Once the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessels are submitted to the NRC in accordance with 10 CFR 50.82(a)(1)(i) and (ii), then pursuant to 10 CFR 50.82(a)(2), the 10 CFR 50 licenses will no longer authorize operation of the Byron reactors or emplacement or retention of fuel in the reactor vessels.

The proposed SEP changes would revise the on-shift staffing and the Emergency Response Organization (ERO) staffing. Exelon has reviewed the proposed changes against the planning standards in 10 CFR 50.47(b) and requirements in 10 CFR 50, Appendix E, and concludes that the standards and requirements will continue to be met.

The proposed changes to the SEP are commensurate with the reduced spectrum of credible accidents in the post-shutdown and permanently defueled condition. In order to assist in the transition from an operating facility to a permanently defueled facility, the changes are required to properly reflect the conditions of the facility while continuing to preserve the Byron Decommissioning Trust Fund and the effectiveness of the SEP.

The proposed changes have been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c), and Exelon has determined that this change involves no significant hazards consideration. Exelon has also determined that the proposed SEP changes satisfy the criteria for categorical exclusion in accordance with 10 CFR 51.22(c)(9) and do not require an environmental review. Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is required.

The description and evaluation of the proposed SEP changes are contained in Attachment 1. Attachment 2 provides a tabular summary of the proposed changes to the SEP. Attachment 3, Exhibits A and B provide the revised pages of the SEP with the proposed changes. Attachment 3 Exhibits C and D provide clean copies of the SEP documents. Attachment 4 provides the analysis of ERO tasks assigned to the ERO positions. Attachment 5 of this letter contains a new regulatory commitment.

On October 12, 2020, Exelon provided the Illinois Emergency Management Agency (IEMA) and Ogle County a draft copy of the Byron Post-Shutdown Emergency Plan (PSEP) for comment. On October 27, 2020 Exelon conducted a call with IEMA to discuss questions and comments on the proposed License Amendment Request, which were subsequently addressed. IEMA provided a letter dated October 29, 2020 stating they do not anticipate submitting concerns to the U.S. Nuclear Regulatory Commission as part of their review process. There were no comments received from Ogle County. Attachment 6 provides a copy of the referenced correspondence from IEMA.

The proposed changes have been reviewed by the Byron Plant Operations Review Committee in accordance with the requirements of the Exelon Quality Assurance Program.

Exelon requests review and approval of the proposed license amendment by October 15, 2021 to support the current schedule for the Byron transition to a permanently defueled facility. Exelon requests that the approved amendment become effective following the submittal of the certifications required by 10 CFR 50.82(a)(1) that Byron, Units 1 and 2 have been permanently defueled. Once approved, the amendments shall be implemented within 90 days from the effective date of the amendments but will not exceed February 28, 2022.

In accordance with 10 CFR 50.91 "Notice for public comment; State consultation," paragraph (b), Exelon is notifying the State of Illinois of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

If you have any questions concerning this submittal, please contact Leslie Holden at (630) 657-2524.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 2nd day of November 2020.

Respectfully,

Patrick R. Simpson
Sr. Manager - Licensing
Exelon Generation Company, LLC

Attachment:
1. Description and Evaluation of Proposed Changes
2. Tabular Summary of Proposed Changes to the Site Emergency Plan
3. Proposed Revision to Site Emergency Plan
4. Emergency Response Organization Task Analysis
5. Summary of Regulatory Commitments
6. Correspondence with State of Illinois

cc: NRC Regional Administrator, Region III
NRC Project Manager, NRR – Byron Station
NRC Senior Resident Inspector – Byron Station
Illinois Emergency Management Agency – Division of Nuclear Safety

Attachment 1

Byron Station

DESCRIPTION AND EVALUATION OF PROPOSED CHANGES

Attachment 1

License Amendment Request

Byron Station

NRC Docket Nos. STN 50-454, STN 50-455, and 72-68

DESCRIPTION AND EVALUATION OF PROPOSED CHANGES

Subject: **Proposed Changes to the Byron Emergency Plan for Permanently Shutdown Condition**

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend the Renewed Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2 (Byron), respectively. The proposed changes would revise Byron Emergency Plan on-shift and Emergency Response Organization (ERO) staffing to support the planned permanent cessation of operations and permanent defueling of the Byron reactors (Reference 8.1). Specifically, the proposed changes would eliminate the on-shift positions not needed for the safe storage of irradiated fuel in the Spent Fuel Pool (SFP) during the initial decommissioning period and eliminate the ERO positions not necessary to effectively respond to credible accidents. The proposed changes in staffing are commensurate with the reduced spectrum of credible accidents for a permanently shutdown and defueled power reactor facility.

Exelon Generation Company, LLC (Exelon) has reviewed the proposed changes against the planning standards in 10 CFR 50.47(b) and requirements in 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," and has concluded that the standards and requirements will continue to be met. Therefore, no exemption from 10 CFR 50.47 or 10 CFR 50, Appendix E, is requested in support of this License Amendment Request (LAR).

As specified in Attachment 5 of this submittal, Exelon has committed to conduct a confirmation Emergency Preparedness (EP) drill to demonstrate that no loss of Emergency Preparedness function will result from the implementation of the proposed changes. The drill will include each of the Emergency Response Facilities (ERF) described in the Byron Emergency Plan.

2.0 PROPOSED CHANGES

2.1 Description of Proposed Changes

The Byron Emergency Plan consists of the following documents:

- EP-BY-1000, "Byron Station Radiological Emergency Plan"
- EP-AA-1002, "Radiological Emergency Plan Annex for Byron Station" (Annex)
- EP-AA-1002, Addendum 1, "Byron Station On-Shift Staffing Technical Basis"
- EP-AA-1002, Addendum 2, "Evacuation Time Estimates for Byron Generating Station Plume Exposure Pathway Emergency Planning Zone"
- EP-AA-1002, Addendum 3, "Emergency Action Levels for Byron Station"

The on-shift and augmented ERO positions are being revised to respond to a reduced spectrum of credible accidents for a permanently shutdown and defueled power reactor facility. Once the fuel is permanently removed from the Byron reactors and relocated to the SFP, Exelon will submit written certification to the NRC in accordance with 10 CFR 50.82(a)(1). Pursuant to 10 CFR 50.82(a)(2), Exelon will no longer be authorized to operate the Byron reactors, or to place or store fuel in the reactor vessels. The scope of applicable emergency operating procedures and abnormal response procedures will be significantly reduced.

Attachment 2 to this LAR provides a tabular summary of the proposed changes to the Byron Emergency Plan and Emergency Plan Annex. Attachment 3 provides the revised pages of the Emergency Plan and Emergency Plan Annex with the proposed changes shown in strikethrough and underline format. Attachment 4 contains an analysis of the ERO tasks. Attachment 5 contains a list of regulatory commitments made as part of this LAR.

2.2 On-Shift Staff

Currently, the Byron Emergency Plan, EP-BY-1000, Appendix 5, Table 5-1: "Emergency Response Organization (ERO) Staffing and Augmentation Plan," specifies the following on-shift Emergency Response staff:

- (1) Shift Emergency Director
- (2) Radiation Protection Personnel
- (1) Shift Communicator[1]
- (1) Shift Dose Assessor[1]
- (1) Emergency Classification Advisor – Emergency Director[1]
- (1) Core/Thermal Hydraulics Engineer – STA[1]

[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.

To support reduced staffing following permanent cessation of operations and permanent removal of fuel from the reactor vessels, the Emergency Plan staffing levels have been evaluated using the methodology in Nuclear Energy Institute (NEI) 10-05 (Reference 8.6), which evaluates the postulated accidents that will be applicable in the permanently defueled condition. The Byron ERO was revised in 2019 (Reference 8.15) based on the Alternative Guidance for Licensee Emergency Response Organizations (Reference 8.16).

The proposed changes to Byron Emergency Plan, EP-BY-1000, Appendix 5, Table 5-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan," eliminates the following positions from the present Emergency Plan staffing levels:

- (1) Radiation Protection Personnel
- (1) Core/Thermal Hydraulics Engineer – STA[1]
- (1) Emergency Classification Advisor[1]

[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.

The required on-shift staff following permanent defueling is commensurate with the need to safely store irradiated fuel at the facility in a manner that is protective of public health and safety. The following proposed Emergency Plan on-shift complement will be required in the permanently shutdown condition:

- (1) Shift Emergency Director
- (1) Radiation Protection Personnel
- (1) Shift Communicator[1]
- (1) Shift Dose Assessor[1]

[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.

Refer to section 5.4.1 for a further discussion of the On-Shift Staffing Assessment performed for the permanently shutdown condition at Byron.

2.3 Emergency Response Organization 60 Minute/90-Minute Augmentation Staff (Minimum Staffing)

Currently, EP-BY-1000, Appendix 5, Table 5-1 specifies the augmented Minimum Staffing for certain positions in the Emergency Preparedness Functions identified in Table B-1 of NUREG-0654, Revision 2. The Byron Emergency Plan (EP-BY-1000) identifies the Minimum Staff as those ERO members that are required to activate their respective ERF at the appropriate Emergency Action Level (EAL) classification level.

Proposed revisions would eliminate 10 Minimum Staff positions, change one (1) Minimum Staff position to a collateral function, and add one (1) position as shown in the Table 2-1, "Byron Minimum Staff Positions," below.

Table 2-1, Byron Minimum Staff Positions
(Response times are 60 minutes unless otherwise noted)

Current Minimum Staff Positions	**Proposed Minimum Staff Positions**
Technical Support Center (TSC)	
Station Emergency Director	Station Emergency Director
ENS Communicator	ENS Communicator
Rad Protection Manager	Rad Protection Manager
Operations Manager	Operations Manager
Core Thermal Engineer	**Position Eliminated**
Mechanical Engineer	**Position Eliminated**
Electrical Engineer	**Position Eliminated**
----	**TSC Engineer (added)**
Security Coordinator	Security Coordinator
Emergency Operations Facility (EOF)	
Corporate Emergency Director	Corporate Emergency Director
State / Local Communicator	State / Local Communicator
Radiation Protection Manager	Radiation Protection Manager
Dose Assessment Coordinator	Dose Assessment Coordinator
Computer Specialist (@ 90 min)	Computer Specialist (@ 90 min)

Joint Information Center	
JIC Director (@ 90 min)	JIC Director (@ 90 min)
Corporate Spokesperson (@ 90 min)	Corporate Spokesperson (@ 90 min)
Public Information Director (@ 90 min)	Public Information Director (@ 90 min)

Operations Support Center (OSC)	
OSC Director	OSC Director
RP Personnel #1	RP Personnel #1
RP Personnel #2	RP Personnel #2
RP Personnel #3	**Position Eliminated**
RP Personnel #4 (@ 90 min)	**Position Eliminated**
RP Personnel #5 (@ 90 min)	**Position Eliminated**
RP Personnel #6 (@ 90 min)	**Position Eliminated**
Mechanical Maintenance	Mechanical Maintenance
Electrical Maintenance	Electrical Maintenance
I&C Technician (@ 90 min)	I&C Technician (@ 90 min)
RP Supv/Lead (@ 90 min)	RP Supv/Lead[1]
Mechanical Maintenance Supv/Lead (@ 90 min)	**Position Eliminated**
Electrical Maintenance Supv/Lead (@ 90 min)	**Position Eliminated**
I&C Supv/Lead (@ 90 min)	**Position Eliminated**
Offsite Field Team #1 Personnel	Offsite Field Team #1 Personnel
Offsite Field Team #1 Driver	Offsite Field Team #1 Driver
Offsite Field Team #2 Personnel (@ 90 min)	Offsite Field Team #2 Personnel (@ 90 min)
Offsite Field Team #2 Driver (@ 90 min)	Offsite Field Team #2 Driver (@ 90 min)
Onsite Field Team #1 Personnel (onsite surveys)	Onsite Field Team #1 **RP** Personnel (onsite surveys)

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.

2.4 Emergency Response Organization Full Augmentation Staff

Full Augmentation staff are those ERO positions which provide support for the Minimum Staff in their response to the emergency. Augmented Staff help facilitate communication and emergency response effort but are not required to implement the key functions/tasks identified in the Emergency Plan. Byron is planning to maintain the following Full Augmentation positions in support of the Post Shutdown Emergency Plan.

- TSC Director (TSC) - The TSC Director is responsible for the content of information transmitted from the TSC to other agencies (or facilities), documenting information received at the TSC in coordination with the Station Emergency Director and provides administrative services in support of emergency/recovery operations.
- Chemistry Personnel (OSC) - Perform Chemistry sample and analysis as requested
- EOF Director (EOF) - The EOF Director reports to the Corporate Emergency Director and has the authority, management ability and technical knowledge to assist the Corporate Emergency Director in the management of Exelon Nuclear's offsite ERO. In the event that the Corporate Emergency Director becomes incapacitated, the EOF Director shall assume the responsibilities of the Corporate Emergency Director until a transfer of Command and Control can be affected either back to the station or to another qualified Corporate Emergency Director.
- Technical Advisor (EOF) - The Technical Advisor reports to the EOF Director. Responsibilities include: Assist the Dose Assessment Coordinator in acquiring technical information pertaining to release pathway and core damage assessment. Provide the Corporate Emergency Director information concerning the status of plant operations, and recommendations for mitigating the consequences of the accident.
- Environmental Coordinator (EOF) - The Environmental Coordinator reports to the EOF Radiation Protection Manager and directs the Field Team Communicator, Field Monitoring Teams and the State Environs Communicator.
- State Environs Communicator (EOF) - The State Environs Communicator is staffed as requested by the applicable state agencies. Responsibilities include coordination of activities and information flow between the EOF Protective Measures Group and the affected state(s) environmental authorities, including periodic updates on meteorological conditions, Field Monitoring Team activities and survey/sample results.
- Logistics Manager (EOF) - The Logistics Manager reports to the EOF Director and directs the activities of the administrative, security and liaison personnel. 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. Ensure shift relief and continual staffing for the EOF.
- EOC Communicator (EOF) - The EOC Communicator coordinates and dispatches EOC Liaisons as needed or requested.
- County EOC Liaison(s) (EOF) - The County EOC Liaison(s) monitor and report County EOC activities to the EOF, conduct briefings and answer questions as needed. The County EOC Liaisons also assist with confirmation/verification of information distributed through approved channels.

- State & REAC EOC Liaison(s) (EOF) - At the request of state officials and/or at the discretion of the Corporate Emergency Director, the State EOC Liaisons monitor and report State EOC activities to the EOF. In addition, the Liaisons assist Emergency Public Information personnel in rumor control and media monitoring.

- Technical Advisor (JIC) - The Technical Advisor assists in development of technical and plant status information for use in news releases and media briefings.

- Access Controller (EOF/JIC) - The Access Controller(s) is responsible for controlling facility access and obtaining authorization prior to admitting Non-Exelon Nuclear officials into the JIC and EOF.

3.0 REASON FOR PROPOSED CHANGES

The proposed changes are desired to reflect the pending permanent cessation of operations and permanent defueling of the Byron reactors. After the reactors are shutdown, all fuel assemblies will be removed from the reactor vessels and placed in the SFP. The irradiated fuel will be stored in the SFP until relocated to the Independent Spent Fuel Storage Installation (ISFSI) at Byron. Once in the ISFSI, the fuel will be stored until it is shipped offsite in accordance with the schedules that will be described in the Post-Shutdown Decommissioning Activities Report (PSDAR) and Spent Fuel Management Plan. Upon submitting the certifications for permanent cessation of operations (10 CFR 50.82(a)(1)(i)) and permanent removal of fuel from the reactor vessels (10 CFR 50.82(a)(1)(ii)), pursuant to 10 CFR 50.82(a)(2), the 10 CFR 50 licenses for Byron will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels.

The proposed revisions to the Byron Emergency Plan are commensurate with the reduction in hazards associated with the permanently defueled condition and will allow the facility staff to transition from those required for an operating facility to those required for a permanently defueled facility. The proposed changes are required to properly reflect the conditions of the facility while continuing to preserve the Byron Decommissioning Trust Fund and the effectiveness of the Byron Emergency Plan.

4.0 BACKGROUND

4.1 On-Shift and ERO Staffing Guidance

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 (Reference 8.3), Section II.B, "Onsite Emergency Organization," presents guidance for meeting the planning standards and requirements of 10 CFR 50.47(b) and 10 CFR 50, Appendix E, Section IV.A. The guidance describes the on-site emergency organization, including the staffing requirements found in Table B-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan." This table specifies a minimum of 10 on-shift responders in four (4) Emergency Preparedness Functions. It also specifies seven (7) on-shift response functions where the duties may be performed

by shift personnel who are assigned other functions (i.e., there are no dedicated responders to perform these functions). Table B-1 specifies two (2) Emergency Preparedness Functions (i.e., firefighting and site access control/personnel accountability), which must be staffed on a site-specific basis.

The on-shift staff must be able to cope with a spectrum of events until augmenting ERO personnel arrive in accordance with the site's Emergency Plan commitments. The augmenting ERO responders assume many managerial, engineering, and administrative duties from the on-shift personnel, allowing on-shift personnel to focus on facility operations.

On November 23, 2011, the NRC published a final rule in the Federal Register (i.e., 76 FR 72560) amending certain EP requirements in its regulations that govern domestic licensing of production and utilization facilities (Reference 8.4). This final rule amended 10 CFR 50, Appendix E, Section IV.A, "Organization," to address the assignment of tasks or responsibilities to on-shift ERO personnel that could potentially overburden them and prevent the timely performance of their emergency plan functions. Specifically, Section IV.A.9 states that licensees shall perform, "...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."

Coincident with the rule change in 10 CFR 50, Appendix E, Section IV.A.9, the NRC issued Interim Staff Guidance (ISG) NSIR/DPR-ISG-01, "Interim Staff Guidance - Emergency Planning for Nuclear Power Plants" (Reference 8.5). This ISG provides information relevant to performing the on-shift staffing analysis. The ISG states that NEI developed NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," (Reference 8.6) to establish a standard methodology for a licensee to perform the required staffing analysis, and that the NRC reviewed NEI 10-05 and found it to be an acceptable methodology for this purpose. The ISG also indicates that the completed staffing analyses are required to be part of the emergency plan and the results documented and submitted to the NRC in accordance with 10 CFR 50.54(q)(5).

In December 2019, NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 2, was issued (Reference 8.13). Section II.B, " Emergency Response Organization," provides revised guidance for meeting the planning standards and requirements of 10 CFR 50.47(b) and 10 CFR 50, Appendix E, Section IV.A. The guidance provides a revised description of the on-site emergency organization, including the staffing requirements found in Table B-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan."

This table specifies a minimum of three (3) on-shift responders in three (3) Emergency Preparedness Functions. It also specifies four (4) on-shift response functions where the duties may be performed by shift personnel who are assigned other functions (i.e., there are no dedicated responders to perform these functions).

4.2 Byron Station On-Shift Staff

In December 2012, an initial on-shift staffing assessment (OSA) was completed in accordance with the NEI 10-05 guidance to satisfy the requirements of 10 CFR 50, Appendix E, Section IV.A.9. This assessment examined the capability of the existing minimum staff to perform the key emergency response actions for events described in the ISG until augmenting ERO staff arrive. The analysis was conducted by a cross disciplinary team of corporate EP personnel and station personnel from the Operations, RP, Chemistry, Licensing, and EP departments. The emergency response to each of the events described in the ISG was determined by conducting a tabletop of the event using the emergency plan and procedures and the applicable departmental procedures such as emergency and off-normal procedures.

Each scenario was reviewed to determine what plant actions and emergency plan implementation actions were required prior to staff augmentation based on plant procedures. These actions were then compared to the minimum staffing for emergency response implementation ensuring that no actions were assigned to staff members that conflicted with either their dedicated emergency response role or their dedicated operational role, as appropriate. The accident scenarios considered in this OSA were the Design Basis Threat (DBT) Ground Assault, Aircraft Probable Threat, Fire Requiring Control Room Evacuation, Design Basis Loss of Coolant Accident (LOCA), Station Blackout (SBO), Main Steam Line Break at 0% power, Feedwater Line Break, Reactor Coolant Pump Shaft Seizure, Control Rod Ejection Accident, and Steam Generator Tube Rupture. The OSA most limiting accident scenario was determined to be a Fire Requiring Control Room Evacuation.

The Byron ERO was revised in 2019 (Reference 8.15) based on the Alternative Guidance for Licensee Emergency Response Organizations (Reference 8.16). A revised Table B-1 (renamed as Appendix 5, Table 5-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan") was incorporated in the Emergency Plan.

EP-BY-1000, Appendix 5, Table 5-1 currently specifies the minimum staffing requirements for the Byron ERO and defines the positions initially responsible for satisfying key ERO functions and specifies positions that will augment the on-shift staff.

In support of this LAR, the Post Shutdown Shift Staffing Assessment was conducted using the guidance of NEI 10-05 and a summary of the results is provided in Section 5.4.1. The Fuel Handling Accident (FHA) (DBA) was included as part of the Post Shutdown OSA, along with DBT Ground Assault, Aircraft Probable Threat, Fire Requiring Fire Brigade Response and EAL Classification, and an FHA resulting in a General Emergency.

4.3 Byron Station Emergency Response Organization Staffing

The Byron Emergency Plan defines four classes of emergency events: Notification of Unusual Event (UE), Alert, Site Area Emergency (SAE), and General Emergency (GE). Because on-shift personnel can normally address an emergency response to UEs without additional support, staff augmentation is not typically activated for a UE

declaration. The Operations Shift Manager (SM) maintains responsibility during UEs. The second classification level, Alert, requires ERO activation of all ERFs. This includes the Technical Support Center (TSC), the Operations Support Center (OSC), the Emergency Operations Facility (EOF), and the Joint Information Center (JIC). Overall responsibility for the event is assumed by the Emergency Director in the EOF. When ERO activation is required, notification is sent to those required to respond to their assigned ERF.

Emergency Plan, EP-BY-1000, Part II, Section B, "Byron Emergency Response Organization," describes how the plant operating organization transitions into an ERO to effectively deal with any incident. Section B.1, "On-Shift Emergency Response Organization Assignments," describes the operating organization on duty at the plant during all shifts.

The Byron Overall ERO Command Structure is shown in EP-BY-1000, Figure B-1a. Staffing for the Emergency Onsite Organization is shown in EP-BY-1000, Figure B-1b (TSC and OSC). Staffing for the Emergency Offsite Organization is shown in EP-BY-1000, Figure B-1c (EOF), and staffing for the Emergency Public Information Organization is shown in EP-BY-1000, Figure B-1d (JIC).

These organizations are notified and staffed depending upon the emergency classification. Elements of the emergency response plan are activated subsequent to an emergency declaration by the SM; designated company personnel are notified and will report to their designated locations, as required. The emergency response actions of the on-shift personnel are performed on a priority basis depending on the emergency conditions, and the immediate need that those conditions dictate, as determined by the on-shift operations crew.

Exelon requires members to act promptly in reporting to their assigned ERF. Emergency Preparedness Implementing Procedures require that team members respond within the committed response time. The ERO is instructed to respond directly to their ERF upon notification. Excess personnel that respond may be assigned support responsibilities or be designated as a relief shift. The proposed revisions to the Emergency Plan will not change these requirements. It will continue to be a management expectation that all qualified individuals for each position respond and report to their respective ERF as quickly as possible. EP procedures identify ERO positions assigned to each facility and the minimum staffing required before each facility can be declared operational and is available to perform its designated functions.

EP-BY-1000, Appendix 5, Table 5-1 identifies the personnel required to staff and activate the TSC, OSC, EOF, and the JIC. The mobilization scheme ensures that specific technical disciplines identified by Table B-1 of NUREG-0654 can be augmented within appropriate timeframes.

5.0 TECHNICAL EVALUATION

5.1 Accident Analysis

Design Bases Accidents

Chapter 15, "Accident Analysis," of the Byron Final Safety Analysis Report as Updated (UFSAR) describes the Abnormal Operational Transients and Design Basis Accident (DBA) scenarios that are applicable during plant operations. Upon submittal of the certifications required by 10 CFR 50.82(a)(1)(i) and (ii), pursuant to 10 CFR 50.82(a)(2), the Byron Part 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. Therefore, most of the accident scenarios postulated in the UFSAR will no longer be applicable once Byron is in the permanently defueled condition.

The UFSAR Chapter 15 FHA in the SFP and the Spent Fuel Cask Drop Accident will remain applicable to Byron in its permanently shutdown and defueled condition. UFSAR Chapter 15 will be revised to eliminate the DBAs that will not be applicable in the permanently defueled condition.

Beyond Design Bases Events

In the permanently defueled condition, Byron will be required to respond to events that involve the loss of SFP cooling and/or water inventory, or external events (e.g. fire, flooding, earthquake, high winds, or hostile actions) that would lead to a loss of SFP cooling and/or water inventory. These strategies will be in place for the protection of the SFP. The strategies will no longer address restoring core cooling and containment since they are not applicable in the permanently defueled condition.

ln the permanently shutdown and defueled condition, the Byron Fire Brigade will implement the SFP inventory makeup strategies required under 10 CFR 50.155(b)(2). The strategies will no longer address restoration of core cooling and containment, since they are not applicable in the permanently shutdown and defueled condition. Byron will continue to maintain a trained and qualified Fire Brigade responsible for implementation of the SFP inventory makeup strategies. The Fire Brigade personnel identified in the Byron Emergency Plan are separate and distinct from those responsible for implementing the major elements of the emergency plan including command and control, emergency classification, offsite notifications, and dose assessment and protective action recommendation development. Therefore, sufficient staffing is available to implement SFP inventory makeup strategies required under 10 CFR 50.155(b)(2) without impacting the performance of designated emergency plan functions. Events involving a loss of SFP cooling or water inventory can be addressed by implementation of SFP inventory makeup strategies required under 10 CFR 50.155(b)(2). These strategies will continue to be maintained to satisfy applicable portions of Byron Unit 1 License Condition 2.C.(22) and Unit 2 License Condition 2.C.(11), "Mitigation Strategy License Condition" and 10 CFR 50.155(b)(2).

5.2 On-Shift Staffing Assessment

To support reduced staffing following permanent cessation of operations and permanent removal of fuel from the reactor vessels, the on-shift staffing levels have been evaluated, in part, using the methodology in NEI 10-05 (Reference 8.6) which evaluates the postulated accidents that will be applicable in the permanently defueled condition. Byron performed a multi-disciplined team review of the on-shift staffing changes. The on-shift staffing assessment considered the following accident scenarios:

- Design Basis Threat - The event evaluated for this analysis assumes a land based threat that is neutralized immediately when inside the protected area fence, no significant damage to equipment or systems that require corrective actions before the ERO is staffed, no radiological release, and no fire that requires firefighting response before the ERO is staffed.

- Fuel Handling Accident - The postulated design basis accident that will remain applicable to Byron in its permanently shutdown and defueled condition is the FHA in the Reactor Building where the SFP is located.

- Aircraft Probable Threat - Notification is received from the NRC that a probable aircraft threat exists.

- Fire Requiring Fire Brigade Response and EAL Classification - A fire occurs in the facility requiring entry into the Emergency Plan and dispatch of the Fire Brigade.

- General Emergency with radioactive release and Protective Action Recommendation (assumed for analysis purposes) - This event is based on the same initial conditions as the FHA, but assumes a dose that exceeds the Environmental Protection Agency's Protective Action Guides beyond the site boundary, and thus necessitates promulgation of a Protective Action Recommendation.

5.3 Functional Area Technical Evaluation

The following provides evaluation of the changes to the Emergency Preparedness Functions found in Table B-1 of NUREG-0654, Revision 2 (Reference 8.13). The changes to each function are discussed in this section. The analysis addressed both on-shift and augmented ERO for each function. The current Byron Emergency Plan, Appendix 5, Table 5-1 lists the following functional areas which align with NUREG-0654, Revision 2.

- Command and Control
- Communications
- Radiation Protection
- Supervision of Radiation Protection Staff and Site Radiation Protection
- Dose Assessments / Projections
- Emergency Classifications
- Engineering

- Security
- Repair Team Activities
- Supervision of Repair Team Activities
- Field Monitoring Teams (FMTs)
- Media Information
- JIC/EOF Information Technology (IT)

5.3.1 Emergency Preparedness Function: Command and Control

Major Tasks

- 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.

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.2 Emergency Preparedness Function: Communication

Major Tasks

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

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.3 Emergency Preparedness Function: Radiation Protection

Major Tasks

- 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.

a. ON-SHIFT

Current Requirements

The current Byron Emergency Plan staffs the following on-shift RP Staff positions:

(2) Radiation Protection Personnel

Proposed Changes

Exelon proposes to eliminate one (1) RP person providing the following on-shift RP Staff positions:

(1) Radiation Protection Personnel *Analysis*

Byron will no longer be an operating nuclear power plant. In accordance with 10 CFR 50.82(a)(1), pursuant to 10 CFR 50.82(a)(2), the Part 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. With irradiated fuel being stored in the SFP and ISFSI, the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The risk in the permanently shutdown and defueled condition is significantly reduced because many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible and the elimination of credible accidents involving an operating reactor provides additional time to plan and execute assessment and mitigation actions. Additionally, the duties and coverages required for the on-shift RP Technician position is reduced. The reduced spectrum of possible accidents limits the necessity to take measures requiring multiple damage control or survey teams in the Protected Area. If additional resources are determined to be necessary during an emergency, Exelon maintains the necessary staffing to provide sufficient personnel trained in RP to respond and perform the required actions, as necessary, in the permanently shutdown and defueled condition.

During the initial stages of an accident, not all areas of the plant would be affected by releases of radioactive materials. Therefore, RP coverage would not be required for all areas. Because entry is expected to be limited to those areas where maintenance necessary to maintain SFP cooling is required and the areas potentially affected by an accident involving the SFP are limited, there is a significant decrease in areas potentially requiring RP coverage in a permanently shutdown and defueled condition. If RP coverage is deemed necessary, multiple emergency teams can be covered by an RP Technician. If RP coverage is not provided (for entry into areas with low radiological risk or known radiological status), worker protection is ensured because emergency workers are required to wear electronic dosimeters, which will alarm at preset dose and dose rate setpoints, and because of the installed Area Radiation Monitors (ARMs), which alarm locally and remotely at preset dose rates, and are located throughout the plant.

The On-Shift RP Technician at Byron also performed the collateral duty of performing the initial Dose Assessment Activities. With the reduction of RP Technicians to one (1), the responsibility for Dose Assessment will be re-assigned to the Operations crew who

will be trained and qualified to perform the function. The re-assignment of the function was assessed in Post Shutdown On-Shift Staffing Assessment for Byron.

b. AUGMENTED ERO

Current Requirements

The Augmented ERO consists of the following positions

- (3) Radiation Protection Personnel (in addition to on-shift coverage) @ 60 minutes
- (3) Radiation Protection Personnel (in addition to on-shift coverage) @ 90 minutes

Proposed Changes

- Eliminate (1) RP Tech at 60 Minutes
- Eliminate (3) RP Techs at 90 Minutes

Analysis

RP OSC Coverage / In-Plant Surveys

One primary function of the RP Technicians augmenting the ERO is to provide RP oversight of the on-shift complement and augmented personnel who are expected to respond to emergency events for damage repair, corrective actions, search and rescue, first aid, firefighting, and personnel monitoring.

Byron will no longer be an operating nuclear power plant. In accordance with 10 CFR 50.82(a)(1), pursuant to 10 CFR 50.82(a)(2), the Part 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. With irradiated fuel being stored in the SFP and ISFSI, the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The risk in the permanently shutdown and defueled condition is significantly reduced because many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible and the elimination of credible accidents involving an operating reactor provides additional time to plan and execute assessment and mitigation actions. Additionally, the duties and coverages required for the RP Technician positions are reduced. If additional resources are determined to be necessary during an emergency, Exelon maintains the necessary staffing to provide sufficient personnel trained in RP to respond and perform the required actions, if necessary, in the permanently shutdown and defueled condition.

The reduced spectrum of possible accidents limits the necessity to take measures requiring multiple damage control or survey teams in the Protected Area. During the initial stages of an accident, not all areas of the plant would be affected by releases of radioactive materials. Therefore, RP coverage would not be required for all areas. Because entry is expected to be limited to those areas where maintenance necessary to maintain SFP cooling is required and the areas potentially affected by an accident involving the SFP are limited, there is a significant decrease in areas potentially

requiring radiation protection coverage in a permanently shutdown and defueled condition. If RP coverage is deemed necessary, multiple emergency teams can be covered by an RP Technician. If RP coverage is not provided (for entry into areas with low radiological risk or known radiological status), worker protection is ensured because emergency workers are required to wear electronic dosimeters, which will alarm at preset dose and dose rate setpoints, and because of the installed ARMs, which alarm locally and remotely at preset dose rates, and are located throughout the plant.

Radioactive Protection / Access Control

The function of these resources is to provide RP oversight of the on-shift complement of personnel and augmented personnel who are expected to respond to emergency events for damage repair, corrective actions, search and rescue, first aid, firefighting and personnel monitoring. They can also be expected to provide for access control and the issuance of dosimetry. Byron will no longer be an operating nuclear power plant. In accordance with 10 CFR 50.82(a)(1), pursuant to 10 CFR 50.82(a)(2), the Part 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. With irradiated fuel being stored in the SFP and ISFSI, the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The risk in the permanently shutdown and defueled condition is significantly reduced because many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible and the elimination of credible accidents involving operating reactors provides additional time to plan and execute assessment and mitigation actions. If additional resources are determined to be necessary during an emergency, Exelon maintains the necessary staffing to provide sufficient personnel trained in RP to respond and perform the required actions, if necessary, in the post-shutdown condition.

During a declared emergency, Radiation Work Permits (RWPs) and dose set points will change depending on the emergency and plant conditions. Both systems have been used by plant workers for several years. Worker dose margins and training qualifications are also automatically verified when the RWP access control system is used. If a worker's dose margin is inadequate or training is expired, the worker's access would be precluded, and the access control system would not allow issuance of an electronic dosimeter. In an emergency, approval to exceed dose margins is required.

During the log-in process, workers acknowledge their electronic dosimeter alarm set points, and they have read and understand their RWP. The electronic dosimeter provides the worker with a continuous status of dose received and work area dose rates and will alarm at preset dose and dose rates. Worker use of electronic dosimeters facilitates more efficient use of RP Technicians to provide RP coverage while preserving the As Low As Reasonably Achievable (ALARA) concept. Access control is maintained because the worker must obtain an electronic dosimeter and enter an RWP number into the access control computer system prior to being allowed access into the Radiologically Controlled Area (RCA). No setup is required for the RWP access control computers, which allows RP Technicians to be used for more critical tasks during emergency response. Personnel are required to self-monitor for radioactive contamination whenever they exit the RCA. No RP involvement is necessary for this contamination monitoring activity because workers are trained to perform this task

without supervision or oversight. However, contaminated personnel exiting the RCA will require RP oversight. The analysis of proposed post-shutdown staffing concluded that in a permanently shutdown and defueled condition, RP Technicians can perform this required action in a timely manner and there are no collateral duties that would prevent the timely performance of this task.

RP coverage will only be performed if the radiological status of a room is unknown and there is a definitive need for emergency workers to enter the room to perform a task. The decision to provide RP coverage may be based on plant radiological conditions as indicated by installed ARMs.

Tasks requiring the issuance of dosimetry are not expected in the initial stages of an event, but during the recovery phase. Prior to self-issuance of dosimetry, workers are assigned an RWP, setpoints are adjusted, and briefings are conducted by RP.

The analysis of proposed post-shutdown on-shift staffing determined there are no time critical RP tasks, and that task performance is directed and prioritized by the Shift Manager for the 60-minute time frame used in the analysis. There are no overlapping RP tasks. Radiation protection tasks could be performed without augmented personnel in the 60-minute time frame used in the analysis.

Activities related to the conduct of surveys of the owner controlled area or radiological assessment of the area surrounding Byron are performed by the Field Team Members described under the Field Monitoring Section of the Appendix 5, Table 5-1 of the Byron Emergency Plan, and are independent of the augmenting RP Technician positions.

Conclusion

The reduction of augmented RP Technicians listed in the Radiation Protection function in Table 5-1 of the Byron Emergency Plan from six (6) to two (2) is acceptable. As discussed above, the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The RP Technicians are supported with the additional on-shift RP Technician and the On-Site Field Team position. Additional RP Technicians are available, and time is available to call in additional personnel should conditions warrant. The risk in the permanently shutdown and defueled condition is significantly reduced because many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible and the elimination of credible accidents involving operating reactors provides additional time to plan and execute assessment and mitigation actions.

5.3.4 Emergency Preparedness Function: Supervision of Radiation Protection Staff and Site Radiation Protection

Major Tasks

- 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 field monitoring team (FMT) direction, until relieved.

- Provide relevant information to applicable communicators who are communicating offsite PARs to OROs, until relieved.

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.5 Emergency Preparedness Function: Dose Assessment / Projections

Major Tasks

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

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

The Dose Assessment Function is re-assigned to the Operations Crew. The elimination of one (1) RP Technician position does not impact the ability of the on-shift staff to perform the initial dose assessment. The analysis of proposed post-shutdown On-Shift Staffing Assessment concluded that in a permanently defueled condition, the Operations crew can perform all required Byron Emergency Plan actions in a timely manner and there are no collateral duties that would prevent the timely performance of emergency plan functions. Operations staff can perform initial dose assessment using existing Emergency Preparedness Implementing Procedures (EPIPs).

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.6 Emergency Preparedness Function: Emergency Classifications

Major Tasks

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

a. ON-SHIFT

Current Requirements

The On-Shift ERO consists of the following position:

- Emergency Classification Advisor[1]

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.

Proposed Changes

- Eliminate the Emergency Classification Advisor position.

Analysis

This function of the Emergency Classification Advisor is to evaluate plant conditions and recommend emergency classifications, until relieved.

Byron will no longer be an operating nuclear power plant. In accordance with 10 CFR 50.82(a)(1), pursuant to 10 CFR 50.82(a)(2), the Part 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. With irradiated fuel being stored in the SFP and ISFSI, the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The risk in the permanently shutdown and defueled condition is significantly reduced because many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible, and the elimination of credible accidents involving an operating reactor provides additional time to plan and execute assessment and mitigation actions.

With the reduced spectrum of credible accidents and operational events, the need for an Emergency Classification Advisor to assist the Emergency Director is no longer needed.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.7 Emergency Preparedness Function: Engineering

Major Task:

- Provide engineering coverage related to the specific discipline of the assigned engineer, until relieved.

a. ON-SHIFT

Current Requirements

The current Byron Emergency Plan staffs (1) Core/ Thermal Hydraulics Engineer – STA to evaluate reactor conditions.

Proposed Changes

Exelon proposes to eliminate the Core/Thermal Hydraulics Engineer – STA from the on-shift staffing.

Analysis

The emergency planning function of the Core/Thermal Hydraulic Engineer-STA is to provide confirmation of adequacy of core cooling, maintenance of coolable core geometry, and to verify that actual plant response to the event is as expected. This function is initially performed by the Core/Thermal Hydraulics Engineer – STA under the guidance of the Operations Shift Manager.

Because of the permanent cessation of operations and removal of fuel from the reactor vessels, Exelon proposes to eliminate the Core/Thermal Hydraulics Engineer – STA position from the emergency plan, since this condition no longer makes the position necessary for technical and analytical assistance for plant operational concerns during abnormal and emergency situations or analysis of events and their effects. The position can be eliminated without increasing the risk to public health and safety because the major task of evaluating core/thermal hydraulics is not necessary in a permanently shutdown and defueled condition.

The NRC requires that Byron's Emergency Plan be at a level of effectiveness commensurate with the potential consequences to public health and safety and common defense and security at the Byron site. With the permanent cessation of operations and the permanent removal of the fuel from the reactor vessels at Byron, most of the accident scenarios postulated for operating power reactors are no longer possible. The irradiated fuel is stored in the SFP or at the ISFSI and will remain on-site until it can be moved offsite for long-term storage or disposal. The reactors, Reactor Coolant Systems (RCS), and reactor support systems are no longer in operation and have no functions related to the storage of the irradiated fuel. Therefore, postulated accidents involving a failure or malfunction of the reactors, RCSs, or reactor support systems are no longer applicable. During reactor decommissioning, the principal public safety concerns involve the radiological risks associated with the storage of irradiated fuel on-site. The proposed level of on-site Operations staff will continue to provide for communication and coordination capabilities with offsite organizations for the level of support required for the remaining DBAs and the prompt implementation of mitigative actions in response to an SFP accident. The Shift Manager/Certified Fuel Handler (CFH) will maintain the capability to perform the function of on-shift technical analysis for the limited applicable accident scenarios associated with the storage of irradiated fuel.

The on-shift technical support function for the remaining accident scenarios associated with the storage of irradiated fuel will be assumed by the Control Room personnel. Byron's post-shutdown OSA validated that the on-shift Shift Manager/CFH can perform any required technical analysis associated with the storage of irradiated fuel until augmented as needed.

Additionally, Byron “License Amendment Request - Proposed Changes to Technical Specifications Sections 1.1, "Definitions," and 5.0, "Administrative Controls," for Permanently Defueled Condition" (Reference 8.2), has been submitted to delete the STA from the Byron Technical Specifications.

b. AUGMENTED ERO

Current Requirements

The current Byron Emergency Plan staffs the following TSC Engineering Staff positions:

- Electrical/Instrumentation and Control (I&C) – Provide engineering coverage for the ERO related to electrical or I&C equipment
- Mechanical – Provide engineering coverage for the ERO related to mechanical equipment
- Core/Thermal Hydraulics – Evaluate reactor conditions

Proposed Changes

Byron proposes to combine the above TSC Engineering Staff positions into a single TSC Engineer position:

- TSC Engineer – Provide engineering coverage for the ERO

Analysis

With the permanent cessation of operations and the permanent removal of the fuel from the reactor vessels at Byron, most of the accident scenarios postulated for operating power reactors are no longer possible. As such, the number and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced, as compared to an operating plant. The set of plant equipment required for a permanently defueled condition is also greatly reduced, which also reduces the spectrum of mitigation activities for an emergency.

The Engineering function will be provided by the TSC Engineer position. The TSC Engineer will be trained to provide engineering support in response to a fuel handling accident or an event resulting in damage to the SFP integrity or loss of SFP cooling or inventory.

Elimination of the TSC Core Thermal/Hydraulic Engineer

The elimination of the Core Thermal/Hydraulic Engineer position will have no effect on emergency response in a permanently defueled condition because the position is primarily responsible to assess the condition of fuel in a reactor core during an emergency. TSC Core Thermal/Hydraulic Engineers have expertise in the area of core damage assessment and core parameter monitoring. The Core Damage Assessment Tool used by the TSC Core Thermal/Hydraulic Engineers does not address assessments of SFP fuel damage.

However, the Dose Assessment Program utilized by the Dose Assessment Coordinator does include in its assessment, irradiated fuel damage in the SFP. The information to support the Dose Assessment program is not specific to the TSC Core Thermal/Hydraulic Engineer qualification and can be provided by the TSC Engineer or

the Operations Manager. The information includes information such as age of fuel, location, or whether the fuel is exposed or covered by water.

The Core Thermal/Hydraulic Engineer position can be eliminated without increasing the risk to public health and safety because the major task of evaluating core/thermal hydraulics is not necessary in a permanently shutdown and defueled condition. A review of major tasks of the Core/Thermal Hydraulics Engineer is provided in Attachment 4, and no essential tasks were identified to support Emergency Planning Functions.

Mechanical/Electrical/Instrumentation & Control Engineer

The primary duties of the TSC Engineer positions include responding to engineering requests from the TSC Emergency Director and assisting the OSC in preparing to send repair teams into the plant. The specific Mechanical and Electrical/I&C Engineer positions in the TSC are being combined into the TSC Engineer position. The position will be filled by a trained engineer.

The TSC Engineer can provide the initial response to an emergency condition. In accordance with the site training program, engineers receive general training in the station's mechanical, electrical and I&C systems, as well as training in print reading and troubleshooting methods. The combination of the TSC Engineer positions into the single engineer is justified because the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The set of plant equipment required in the permanently shutdown and defueled condition is also greatly reduced, which reduces the assessment and mitigation activities the TSC must perform. Additional engineering resources will continue to be available as augmented positions, video consultation, or remote response.

The assessment and disposition of specific responsibilities and tasks for the TSC Engineers is addressed in Attachment 4 of this submittal. It is concluded that the Core/Thermal, Mechanical, and Electrical/I&C Engineers' responsibilities and tasks can be maintained by the TSC Engineer. As such, TSC Engineer positions can be reduced without impacting Exelon's ability to respond to the spectrum of credible accidents and operational events for a permanently shutdown and defueled reactor. If additional engineering support is identified as needed at any time during the response to the emergency condition, engineering support can be obtained through call-outs, video conferencing, or remote work support. The engineering staff has the capability to respond remotely with access to the station procedures and drawings.

The proposed change to the level of augmented ERO staffing continues to meet the planning standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR 50, commensurate with the reduced spectrum of credible accidents in the permanently defueled condition, and ensures that Byron retains the ability to promptly implement the SFP mitigation actions.

5.3.8 Emergency Preparedness Function: Security

Major Tasks

- Coordinate security-related activities and information with the Emergency Coordinator.

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.9 Emergency Preparedness Function: Repair Team Activities

Major Tasks

- Provide support for event mitigation and equipment repair.
- Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable (I&C).

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.10 Emergency Preparedness Function: Supervision of Repair Team Activities

Major Tasks

- Supervise OSC activities

a. ON-SHIFT

There are no proposed changes to this on-shift function.

b. AUGMENTED ERO

Current Requirements

The current Byron Emergency Plan staffs the following OSC Supervision of Repair Team Activities Staff positions:

(1) OSC Director - Supervise OSC activities as directed by Emergency Coordinator
OSC Supervisors

(1) Electrical Maintenance Supervisor /Lead @ 90 mins: Supervise OSC activities related to electrical equipment.

(1) Mechanical Maintenance Supervisor / Lead @ 90 mins: Supervise OSC activities related to mechanical equipment.

(1) I&C Supervisor / Lead @ 90 mins: Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor.

(1) Radiation Protection Supervisor / Lead @ 90 mins: Supervise OSC activities related to radiation protection.

Proposed Changes

Exelon proposes to eliminate the following Supervision of Repair Team Activities positions:

(1) Electrical Maintenance Supervisor /Lead @ 90 mins: Supervise OSC activities related to electrical equipment.

(1) Mechanical Maintenance Supervisor / Lead @ 90 mins: Supervise OSC activities related to mechanical equipment.

(1) I&C Supervisor / Lead @ 90 mins: Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor.

Exelon proposes to revise the following position to allow this to be assigned as a collateral duty for an RP Technician:

(1) Radiation Protection Supervisor / Lead[1]

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.

Analysis

Exelon proposes to eliminate the Mechanical Maintenance, Electrical Maintenance and I&C Supervisor / Lead positions. Exelon will maintain the OSC Director position and the Radiation Protection Supervisor/Lead function.

The OSC Director will provide overall supervision and direction to the initial OSC responders. If at any time the OSC Director determines that additional support is necessary to accomplish the mission of the OSC, the OSC Director will contact the EOF to arrange for support by additional personnel.

Byron ERO staffing, as required by the Byron Emergency Plan, is intended to address the risks to public health and safety inherent in operating reactors. The risk in the permanently shutdown and defueled condition is significantly reduced. Many of the potential initiating conditions that would lead to an emergency declaration will no longer be credible. The set of plant equipment required in the permanently shutdown and defueled condition is also greatly reduced, which reduces the assessments and

mitigation activities that the OSC must perform. The spectrum of credible accidents and operational events, and the quantity and complexity of activities required for safe storage of irradiated fuel is reduced, as compared to operating power reactors.

The primary events of concern in the immediate post-shutdown and defueled condition will be an FHA or a loss of SFP cooling and/or water inventory. Restoration of equipment supporting irradiated fuel cooling and inventory will be the primary focus of emergency mitigation actions for the TSC/OSC in a permanently shutdown and defueled condition.

In the permanently shutdown and defueled condition, there is no longer any complex automatic control systems in service. The OSC Technician response is reduced, and therefore, the need for direct oversight of each of the OSC Maintenance disciplines can be performed by the OSC Director given the reduced spectrum of credible accidents and operational events. The OSC Director will continuously evaluate the need for resources and call in additional qualified personnel, as needed. OSC resources will continue to be augmented positions with specific training and qualification requirements for assigned personnel in accordance with the site training program. Note that the RP Technicians' response will be supported by the Radiation Protection Supervisor / Lead function.

The proposed change to the level of ERO staffing continues to meet the planning standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR Part 50, commensurate with the reduced spectrum of credible accidents in the permanently defueled condition, and ensures that Exelon retains the ability to promptly implement SFP mitigation actions.

5.3.11 Emergency Preparedness Function: Field Monitoring Teams (FMTs)

Major Tasks

- Assess the protected area for radiation and contamination and provide input to the TSC Radiation Protection Manager (RPM). Responsible for radiation protection coverage for the FMTs as directed by TSC RPM or EOF RPM.

- Assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMTs as directed by EOF RPM.

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

Current Requirements

The current Byron Emergency Plan staffs the Onsite Field Team member as (1) Qualified individual to assess the protected area for radiation and contamination and

provide input to the TSC RPM.

Proposed Changes

The staffing of the position is revised to (1) RP Personnel to assess the protected area for radiation and contamination and provide input to the TSC RPM.

Analysis

The staffing of the Onsite Field Monitoring position is revised from a Qualified individual to specify RP Personnel. RP Personnel consists of persons with an ANSI qualification. This includes RP Technicians or qualified RP Staff members. This is consistent with the guidance provided in the NRC's Technical Basis for the Proposed Guidance in NUREG-0654/FEMA-REP-1, Section II.B, "Emergency Response Organization" (Reference 8.17). The revision of this requirement allows for the Onsite Survey RP person to support other station RP responsibilities during the emergency if needed.

5.3.12 Emergency Preparedness Function: Media Information

Major Tasks

- Manage and coordinate media information related to the event.

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.3.13 Emergency Preparedness Function: JIC/EOF Information Technology (IT)

a. ON-SHIFT

There are no changes to the on-shift staffing for this function.

b. AUGMENTED ERO

There are no changes to the augmented staffing for this function.

5.4 Byron Emergency Plan ERO Changes – ERF Analysis

5.4.1 Control Room

For Byron, the Emergency Plan commitment for minimum staffing is based on the 2019 "Issuance of Amendments to Revise the Emergency Response Organization Staffing Requirements," dated March 21, 2019 (Reference 8.15).

As described in Section II.H of the Byron Emergency Plan, EP-BY-1000, the Control Room is the centralized on-site location from which Byron's plant systems are

monitored. The Control Room is equipped with the instrumentation to supply detailed information on the plant systems. The Control Room is continuously staffed with qualified operators. The Control Room is the first onsite facility to become involved with the response to emergency events. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency and initiate activities necessary for coping with the emergency until such time that support centers can be activated.

The proposed on-shift staffing changes were evaluated using the Functional Area Analysis of the NUREG-0654 Table B-1, Revision 2, Functions. With the permanent cessation of operations and the permanent removal of the fuel from the reactor vessels at Byron, most of the accident scenarios postulated for operating power reactors are no longer possible. The irradiated fuel is stored in the SFP or at the ISFSI, and will remain on-site until it can be moved offsite for long-term storage or disposal. The reactors, RCSs, and reactor support systems are no longer in operation and have no function related to the storage of the irradiated fuel. Therefore, postulated accidents involving a failure or malfunction of the reactors, RCSs, or reactor support systems are no longer applicable. During facility decommissioning, the principal public safety concerns involve the radiological risks associated with the storage of irradiated fuel on-site. The proposed level of on-site operations staff will continue to provide for communication and coordination capabilities with offsite organizations for the level of support required for the remaining DBAs and the prompt implementation of mitigative actions in response to an SFP accident.

The Functional Analysis (Section 5.3) concluded that the proposed on-shift staffing changes do not impact the capabilities of the on-shift staff to respond to an emergency and continues to comply with the Emergency Plan, site commitments and regulations.

<u>On-Shift Staffing Assessment</u>

To support ERO staffing changes following permanent cessation of operations and permanent removal of fuel from the reactor vessels, the Post-Shutdown On-shift Staffing Assessment was evaluated in conjunction with the postulated accidents previously evaluated using NEI 10-05 methodology. The Post-Shutdown On-Shift Staffing Assessment results validated the following changes to the Byron on-shift staff.

Note that changes in position titles (e.g., Non-Certified Operator (NCO), Certified Fuel Handler (CFH), respectively) are consistent with proposed changes to the Byron Technical Specifications (TS) (Reference 8.2) that revise the minimum shift staffing requirements at Byron by replacing references to licensed and non-licensed operators with references to CFHs and NCOs.

The term NCO is used to differentiate from CFH. CFHs will supervise/perform fuel handling operations in the permanently defueled condition. Shift Managers (SMs) will be qualified as CFHs. Therefore, any reference to the SM position throughout this submittal is considered to encompass the CFH position requirements. NCOs will perform duties typically associated with those performed by Auxiliary Operators (AO), such as manipulation and monitoring of plant equipment. NCOs can also be assigned to monitor indications and communications in the Control Room. The NCO position may be filled by a Certified Fuel Handler (CFH).

Current On-Shift Staff	**Post Shutdown On-Shift Staff**
(1) Shift Manager	(1) Shift Manager/CFH[(1)]
(1) Control Room Supervisor	(1) NCO[(1)]
(1) Shift Technical Advisor	(1) NCO[(1)]
(3) Reactor Operators	(1) EP Communicator
(4) Equipment Operators	(1) RP Technician
(1) EP Communicator	(*) Fire Brigade (per the Fire Plan)
(2) RP Technicians	
(1) Core/Thermal Hydraulics Engineer – STA[(2)]	
(1) Emergency Classification Advisor[(2)]	
(*) Fire Brigade (per the Fire Plan)	
Total = 13 plus Fire Brigade	**Total = 5 plus Fire Brigade**

(1) Titles are consistent with changes to Technical Specifications. Non-Certified Operators (NCO) will perform duties typically associated with those performed by Auxiliary Operators (AO) and Reactor Operators (RO), such as manipulation and monitoring of plant equipment. NCOs are also qualified to perform EP Communications (ENS/State Local Notifications). The NCO position may be filled by a Certified Fuel Handler (CFH). The SM will be qualified as a CFH. However, the SM requires additional qualification to perform Emergency Director responsibilities beyond the CFH training.

(2) 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.

The OSA validated that in a permanently defueled condition one (1) on-shift SM (CFH), one (1) RP Technician, two (2) NCOs, one (1) EP Communicator, and fire brigade members can perform all required Emergency Plan actions in a timely manner and there are no collateral duties that would prevent the timely performance of Emergency Plan functions.

Specifically, Byron will no longer be an operating nuclear power plant. In accordance with 10 CFR 50.82(a)(1), pursuant to 10 CFR 50.82(a)(2), the Part 50 licenses will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels. With irradiated fuel being stored in the SFP and ISFSI, the spectrum of credible accidents and operational events, and the quantity and complexity of activities required for the safe storage of irradiated nuclear fuel is reduced as compared to an operating plant. The risk in the permanently shutdown and defueled condition is significantly reduced because many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible and the elimination of credible

accidents involving an operating reactor provides additional time to plan and execute assessment and mitigation actions. As such, the following On Shift positions can be removed

- Control Room Supervisor
- Shift Technical Advisor
- Reactor Operators
- Core/Thermal Hydraulics Engineer – STA
- Emergency Classification Advisor

Exelon will ensure a sufficient number of personnel are initially trained to support the on-shift positions prior to implementation of the post shutdown Emergency Plan.

Consistent with the methodology of NEI 10-05, the present Emergency Plan OSA evaluated postulated accident scenarios. Chapter 15 of the Byron UFSAR describes the Abnormal Operational Transients and DBA scenarios that are applicable during plant operations. Upon the submittal of the certifications required by 10 CFR 50.82(a)(1), the 10 CFR 50 licenses for Byron will no longer authorize operation of the reactors or emplacement or retention of fuel into the reactor vessels, as specified in 10 CFR 50.82(a)(2). Therefore, most of the accident scenarios postulated in the UFSAR will no longer be applicable once Byron is in the permanently defueled condition.

The primary events of concern in the immediate post-shutdown and defueled condition will be an FHA or a loss of SFP cooling and/or water inventory.

Events involving a loss of SFP cooling and/or water inventory can be addressed by implementation of normal and emergency SFP inventory makeup strategies and mitigating strategies required under Byron Unit 1 License Condition 2.C.(22) and Unit 2 License Condition 2.C.(11), "Mitigation Strategy License Condition" and 10 CFR 50.155(b)(2).

The following scenarios were evaluated for Byron in the Post-Shutdown OSA:

- Design Basis Threat - The event evaluated for this analysis assumes a land based threat that is neutralized immediately when inside the protected area fence, no significant damage to equipment or systems that require corrective actions before the ERO is staffed, no radiological release, and no fire that requires firefighting response before the ERO is staffed.
- Aircraft Potential Threat (50.54(hh)) - Notification is received from the NRC that a potential aircraft threat exists.
- Fire Requiring Fire Brigade Response and EAL Classification - A fire occurs in the facility requiring entry into the Emergency Plan and dispatch of the Fire Brigade.

- Fuel Handling Accident (FHA) - The postulated design basis accident that will remain applicable to Byron in its permanently shutdown and defueled condition is the FHA in the fuel handling building where the SFP is located.

- FHA General Emergency (GE) with radioactive release and Protective Action Recommendation (PAR) (assumed for analysis purposes) - This event is based on the same initial conditions as the FHA, but assumes a dose that exceeds the EPA PAGs beyond the site boundary, and thus necessitates promulgation of a PAR.

The OSA validated that in a permanently defueled condition one (1) on-shift SM (CFH), one (1) RP Technician, two (2) NCOs, one (1) EP Communicator and station fire brigade members can perform all required Emergency Plan actions in a timely manner and there are no collateral duties that would prevent the timely performance of Emergency Plan functions.

5.4.2 Augmented ERO Staff

The Byron Emergency Plan identifies Minimum Staff as those ERO members needed to support Facility Activation. A facility is activated only after it reaches minimum staff and is available to perform its designed functions.

In the permanently defueled condition, Byron will maintain multiple ERO teams. When the Shift Manager directs the activation of the ERO call out system, all ERO members on all teams are notified and are directed to respond to ensure adequate coverage of all ERO positions at all ERFs.

Exelon requires members to act promptly in reporting to their assigned ERF. All ERO staff are trained to respond directly to their ERF if available. Excess personnel that respond may be assigned support responsibilities or be designated as a relief shift. This conservative policy ensures timely activation. The proposed revisions to the Emergency Plan will not change these requirements. It will continue to be a management expectation that all qualified individuals for each position respond and report to their respective ERF as quickly as possible. EP procedures identify ERO positions assigned to each facility and the minimum staffing required before each facility can be declared operational and is available to perform its designed functions.

The EP procedures will continue to assign responsibilities to ERO responders, with the purposes of removing the responsibilities of coordinating with offsite responders and delivering information to the public from the Control Room, allowing operations personnel to focus on returning the plant to a safe condition.

The risk in the permanently defueled condition is significantly reduced. Many of the potential initiating conditions that would lead to an emergency declaration will no longer be credible. The set of plant equipment required in the permanently defueled condition is also greatly reduced, which reduces the assessments and mitigation activities the ERO staff (TSC/OSC/EOF) must perform. Restoration of equipment supporting SFP cooling and inventory will be the primary focus of emergency mitigation actions for the TSC/OSC staff in a permanently shutdown and defueled condition. Although ERO activation/response time requirements will be unchanged, the elimination of accidents involving operating reactors provides additional time to plan and execute assessment and mitigation actions.

5.4.3 Technical Support Center

As described in Section II.H of the Byron Emergency Plan, the TSC is the on-site location utilized to support the Control Room for assessment of plant status and potential offsite impact, and for implementation of emergency actions. The TSC provides technical data and information to the EOF.

The proposed changes to the Byron Emergency Plan do not involve any physical modifications to, or layout/configuration changes, or relocation of the TSC. The TSC meets the requirements of NUREG-0696 for size and habitability, including a filtered heating, ventilation and air conditioning (HVAC) system that can be isolated in the event of a radiological accident.

The proposed changes to the TSC Minimum Staff do not impact the capability to assess and monitor actual or potential offsite consequences of a radiological emergency. Appropriate assessment and mitigation are well within the capabilities of the proposed TSC staff provided in Table 5.1 below.

Table 5.1: Emergency Response Organization
TSC Minimum Staffing Positions

Current Minimum Staff Positions	**Proposed Minimum Staff Positions** (response times are 60 minutes unless otherwise noted)
Station Emergency Director	Station Emergency Director
Radiation Protection Manager	Radiation Protection Manager
Operations Manager	Operations Manager
ENS Communicator	ENS Communicator
Security Coordinator	Security Coordinator
Core Thermal Engineer	**(Position Eliminated)**
Mechanical Engineer	**(Position Eliminated)**
Electrical Engineer	**(Position Eliminated)**
----	**TSC Engineer (position added)**

The functional analysis in Section 5.3 provided justification for the elimination of key TSC Minimum Staffing Positions. ERO tasks have been reviewed and tasks for eliminated positions will be transferred appropriately. The analysis of the ERO staff tasks assigned by the Emergency Plan is found in Attachment 4 of this submittal. Attachment 4 evaluates and dispositions each EP task as being reassigned or eliminated and provides justification, as appropriate. It is ascertained from the Attachment 4 assessment, that given the elimination of credible accidents involving operating reactors, the proposed ERO Minimum Staff can continue to satisfactorily perform their existing Emergency Plan responsibilities as well as any transferred responsibilities.

5.4.4 Operations Support Center (OSC)

As described in Section II.H of the Byron Emergency Plan, the OSC is the on-site location where station support personnel report during and emergency and from which they will be dispatched for assignments or tasks in support of emergency operations. The proposed changes to the Byron Emergency Plan do not involve any physical modifications to, or layout/configuration changes to the OSC.

In the permanently shutdown and defueled condition, the primary functions of the OSC will remain dispatching of, and accounting for, Repair and Corrective Action Teams. The OSC Director is responsible for ensuring adequate staffing of the OSC supporting the emergency; working with the TSC staff to set priorities for the OSC; and directing the activities of the OSC to support the emergency response.

The proposed staffing to the OSC Minimum Staff does not impact the ability to respond to issues related maintaining irradiated fuel in the SFP. Appropriate repair and corrective action capability are provided by the OSC Minimum Staff provided in Table 5.2 below.

Table 5.2: Emergency Response Organization
OSC Minimum Staffing Positions

Current Minimum Staff Positions	**Proposed Minimum Staff Positions** (response times are 60 minutes unless otherwise noted)
OSC Director	OSC Director
RP Personnel #1	RP Personnel #1
RP Personnel #2	RP Personnel #2
RP Personnel #3	**(Position Eliminated)**
RP Personnel #4 @ 90 Min	**(Position Eliminated)**
RP Personnel #5 @ 90 Min	**(Position Eliminated)**
RP Personnel #6 @ 90 Min	**(Position Eliminated)**
Mechanical Maintenance Tech	Mechanical Maintenance Tech
Electrical Maintenance Tech	Electrical Maintenance Tech
I&C Tech @ 90 Min	I&C Tech @ 90 Min
Mechanical Maintenance Supv/Lead @ 90 Min	**(Position Eliminated)**
Electrical Maintenance Supv/Lead @ 90 Min	**(Position Eliminated)**
I&C Supv/Lead @ 90 Min	**(Position Eliminated)**

RP Supv/Lead @ 90 Min	RP Supv/Lead - 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.
Offsite Field Team #1 Personnel	Offsite Field Team #1 Personnel
Offsite Field Team #1 Driver	Offsite Field Team #1 Driver
Offsite Field Team #2 Personnel @90 min.	Offsite Field Team #2 Personnel @90 min.
Offsite Field Team #2 Driver @90 min.	Offsite Field Team #2 Driver @90 min.
On-site Field Team #1 Personnel (onsite surveys)	On-site Field Team #1 **RP** Personnel (onsite surveys)

The functional analysis in Section 5.3 provided justification for the elimination of key OSC Minimum Staffing Positions. ERO tasks have been reviewed and tasks for eliminated positions will be transferred appropriately. The analysis of the ERO staff tasks assigned by the Emergency Plan is found in Attachment 4 of this submittal. The Attachment evaluates and dispositions each EP task as being reassigned or eliminated and provides justification, as appropriate. It is ascertained from the Attachment 4 assessment, that given the elimination of credible accidents involving operating reactors, the proposed ERO Minimum Staff can continue to satisfactorily perform their existing Emergency Plan responsibilities as well as any transferred responsibilities.

Byron ERO staffing, as required by the Byron Emergency Plan, is intended to address the risks to public health and safety inherent in operating reactors. The risk in the permanently shutdown and defueled condition is significantly reduced. Many of the potential initiating conditions that would lead to an emergency declaration will no longer be possible. The set of plant equipment required in the permanently shutdown and defueled condition is also greatly reduced, which reduces the assessments and mitigation activities that the OSC must perform. The spectrum of credible accidents and operational events, and the quantity and complexity of activities required for safe storage of irradiated fuel is reduced, as compared to operating power reactors. Restoration of equipment supporting SFP cooling and inventory will be the primary focus of emergency mitigation actions for the TSC/OSC in a permanently shutdown and defueled condition. The proposed staffing can respond to the expected repair activities with adequate RP oversight.

The primary events of concern in the immediate post-shutdown and defueled condition will be an FHA or a loss of SFP cooling and/or water inventory. Events involving a loss of SFP cooling and/or water inventory can be addressed by implementation of the SFP inventory makeup strategies, as required under Byron Unit 1 License Condition 2.C.(22) and Unit 2 License Condition 2.C.(11), "Mitigation Strategy License Condition" and 10 CFR 50.155(b)(2). OSC staff is not relied upon to implement SFP inventory makeup.

The proposed change to the level of ERO staffing continues to meet the planning standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR Part 50, commensurate with the reduced spectrum of credible accidents in the permanently defueled condition, and ensures that Exelon retains the ability to promptly implement SFP mitigation actions.

5.4.5 Emergency Operations Center (EOF)

As described in Section II.H of the Byron Emergency Plan, the EOF is the location where the Corporate Emergency Director will direct a staff in evaluating and coordinating the overall company activities involved with an emergency.

The EOF is located west of Chicago, in Warrenville IL, in the Exelon Nuclear Cantera facility. This facility supports the Braidwood, Byron, Clinton, Dresden, LaSalle and Quad Cities stations. The EOF facility is shared between the six nuclear plants. The EOF staffing for Byron will align with the Exelon Fleet EOF staffing levels. The proposed changes to the Byron Emergency Plan do not involve any physical modifications to, or layout/configuration changes to the EOF.

There are no proposed changes to the EOF Minimum Staff. Appropriate assessment and mitigation are well within the capabilities of the EOF minimum staff provided in Table 5.3 below.

Table 5.3: Emergency Response Organization
EOF Minimum Staffing Positions

Byron Operational ERO Minimum Staff Positions	**Byron Post-Shutdown ERO Minimum Staff Positions**
Corporate Emergency Director	Corporate Emergency Director
State / Local Communicator	State / Local Communicator
Radiation Protection Manager	Radiation Protection Manager
Dose Assessment Coordinator	Dose Assessment Coordinator
Computer Specialist @ 90 min	Computer Specialist @ 90 min

5.4.6 Joint Information Center (JIC)

As described in Section II.G of the Byron Emergency Plan, the JIC is the facility in which media personnel gather to receive information related to the emergency event. The JIC is the location where approved news releases will be provided to the media for dissemination to the public.

The JIC is located west of Chicago, in Warrenville IL, in the Exelon Nuclear Cantera facility. This facility supports the Braidwood, Byron, Clinton, Dresden, LaSalle and Quad Cities stations. The JIC facility is shared between the six nuclear plants. The JIC staffing for Byron will align with the Exelon Fleet JIC staffing levels. The proposed changes to the Byron Emergency Plan do not involve any physical modifications or layout/configuration changes to the JIC.

The JIC Minimum Staffing as shown in Table 5.4 below and has not been changed.

Table 5.4: Emergency Response Organization
JIC Minimum Staffing Positions

Current Minimum Staff Positions	**Proposed Minimum Staff Positions** (response times are 90 minutes)
JIC Director	JIC Director
Corporate Spokesperson	Corporate Spokesperson
Public Information Director	Public Information Director

5.5 Assessment of Staff Changes on Offsite Emergency Response Organizational Interfaces

The proposed changes to the Byron Emergency Plan were evaluated for impacts on the ability of State and local response organizations to effectively implement their FEMA-approved Radiological Emergency Plans.

The following list of additional actions involve support or direct interface with the State of Illinois, are not being revised and will continue to be performed by ERO positions as currently assigned and shown in Attachment 4.

1. Corporate Emergency Director – Following assumption of Command and Control, ensure that Federal, state and local authorities and industry support agencies remain cognizant of the status of the emergency situation. If requested, dispatch informed individuals to offsite governmental Emergency Operation Centers (EOCs).

2. EOF Radiation Protection Manager – Ensure State authorities are provided information pertaining to Exelon Field Monitoring Teams activities and sample results.

3. JIC Corporate Spokesperson – Coordinate with Federal, State and local agencies, as well as with other organizations involved in the emergency response, to maintain factual consistency of information to be conveyed to the news media/public.

4. JIC Director – Coordinate with Federal, State and local agencies, as well as with other organizations involved in the emergency response, to maintain factual consistency of information to be conveyed to the news media/public.

5. State/Local Communicator - Communicate and receive information via the Nuclear Accident Reporting System (NARS) circuit or commercial telephone line with appropriate State and county agencies.

Although the State EOC liaisons/communicators were previously removed from the Byron Emergency Plan (Reference 8.15) and will be managed and controlled by EPIPs, they are still available to be dispatched per Corporate Emergency Director discretion.

Exelon also concluded there were no interface or coordination impediments identified because of the change to the Byron Emergency Plan.

A preliminary review of the proposed changes prior to the formal submission of the LAR has been performed by the Illinois Emergency Management Agency.

5.6 Validation and Training

To validate the results of the analysis, a drill will be developed and conducted prior to implementation of the changes described within this LAR. The drill will be conducted to confirm the ability of the post-shutdown ERO to perform the necessary functions of each ERF. The drill will evaluate and validate the ability to accomplish the stated mission of each ERF and ensure that the planning standard functions are preserved with no degradation in time sensitive activities or in the ability to communicate with offsite response organizations. The drill will also validate that the post-shutdown ERO continues to address the risks to public health and safety and comply with the Byron Emergency Plan, site commitments, and applicable regulations. Implementing procedures will be revised to address the permanently shutdown and defueled conditions. The revised procedures will be used to support training of the ERO staff and the conduct of drills described above.

Training and procedures will be developed and in place prior to performing the post-shutdown ERO drill. The drill scenario will include SFP events and will be designed to test the major elements of the Byron post shutdown Emergency Plan. Major elements to be tested will include communications and coordination with offsite response organizations, including the JIC. State, local and Federal response organizations will be provided the opportunity to participate in or observe the drills, as specified in the commitment in Attachment 5.

Also as provided in Attachment 5, other training drills will be conducted to train post-shutdown station ERO members. These drills may not involve all Exelon ERFs or State/local participation; however, all ERO members will participate in at least one (1) training drill. The post shutdown EP procedures which support the defueled condition will be available in draft form to support the drills. Final implementation of the procedures will occur concurrent with implementation of the post shutdown emergency plan.

5.7 ERO Change Summary

Exelon completed an evaluation of the proposed reduction in on-shift and ERO staffing and completed a post-shutdown OSA for Byron to validate the ability of the proposed defueled on-shift to respond to an emergency. Exelon further assessed the ability of the ERO augmented staff to respond to an emergency through a Task Analysis.

The proposed ERO staffing changes do not impact the capabilities of the on-shift staffing or augmented response. The ERFs will continue to be activated at an Alert or higher classification. Functional responsibilities of the positions eliminated as a result of the changes described within are being reassigned to remaining positions or eliminated if no longer applicable to the permanently defueled condition. The proposed ERO staffing reductions continue to address the risks to public health and safety, comply with the Emergency Plan, site commitments, and regulation.

The proposed changes do not impact the capability to assess and monitor actual or potential offsite consequences of a radiological emergency and the ability to promptly implement SFP mitigation actions. Appropriate assessment and mitigation actions are within the capabilities of the reduced ERO staff.

6.0 REGULATORY EVALUATION

6.1 Applicable Regulatory Requirements

On-Shift and ERO Staffing

The specific standards for establishing an onsite emergency organization to respond to emergency events appears in 10 CFR 50.47(b) and 10 CFR 50, Appendix E, Section IV.A. Specifically:

- 10 CFR 50.47(b)(1) states in part that: "...each principal response organization has staff to respond and to augment its initial response on a continuous basis."

- 10 CFR 50.47(b)(2) states in part that: "...adequate staffing to provide initial facility accident response in key functional areas is maintained at all times," and that "timely augmentation of response capabilities is available ...."

- 10 CFR 50, Appendix E, Section IV, Part A, "Organization," states in part that: "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 ...."

- 10 CFR 50, Appendix E, Section IV.A.1: [Emergency Plans must contain] "A description of the normal plant operating organization."

- 10 CFR 50, Appendix E, Section IV.A.2: [Emergency Plans must contain] "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."

- 10 CFR 50, Appendix E, Section IV.A.9 states that licensees shall perform "...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."

Guidance

Regulatory Guide 1.101 (RG 1.101), Revision 4, "Emergency Planning and Preparedness for Nuclear Power Reactors" (Reference 8.7), Section C, states in part,

> *The criteria and recommendations in Revision 1 of NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (November 1980),*

> *are methods acceptable to the NRC staff for complying with the standards in 10 CFR 50.47 that must be met in onsite and offsite emergency response plans. These criteria provide a basis for NRC licensees and State and local governments to develop acceptable radiological emergency plans and improve emergency preparedness.*

In NUREG-0654 (Reference 8.3), Section II, "Planning Standards and Evaluation Criteria," Evaluation Criteria II.B.1 and II.B.5 address the 10 CFR 50.47(b)(2) planning standard. Evaluation Criterion II.B.1 specifies the on-site emergency organization of plant staff personnel for all shifts, and its relation to the responsibilities and duties of the normal staff complement. Evaluation Criterion II.B.5 states in part that:

> *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 on-site 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.*

NSIR/DPR-ISG-01, "Interim Staff Guidance - Emergency Planning for Nuclear Power Plants" (Reference 8.5) provides information relevant to performing the on-shift staffing analysis. The ISG states that NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," (Reference 8.6) is an acceptable methodology for performing the staffing analysis. The ISG also indicates that the completed staffing analyses are required to be part of the emergency plan and the results documented and submitted to the NRC in accordance with 10 CFR 50.54(q)(5).

Regulatory Guide 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors," (Reference 8.8), describes a method that the NRC considers to be acceptable to implement the requirements in 10 CFR 50.54(q). In Section 2.a.(1), the NRC encourages licensees to arrange a conference call with the NRC staff to clarify 10 CFR 50.54(q) requirements and guidance within this regulatory guide for EP changes that increase the activation time of emergency response facilities.

Regulatory Issue Summary 2005-02, "Clarifying the Process for Making Emergency Plan Changes," Revision 1 (Reference 8.9) was issued by the NRC to clarify the meaning of "decrease in effectiveness" and the process for making changes to emergency plans, and to provide some examples of changes that are considered to be a decrease in effectiveness.

6.2 Precedent

The requested changes to the on-shift staffing and ERO staffing are similar in nature to the post-shutdown changes approved by the NRC and implemented by Vermont Yankee Nuclear Power Station (Reference 8.10) and Duane Arnold (Reference 8.11).

6.3 No Significant Hazards Consideration Determination

Pursuant to 10 CFR 50.92, Exelon Generation Company, LLC (Exelon) has reviewed the proposed changes and concludes that the changes do not involve a significant hazards consideration because the proposed changes satisfy the criteria in 10 CFR 50.92(c). These criteria require that operation of the facility in accordance with the proposed amendment would 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.

The proposed changes would revise the Byron Station (Byron) Emergency Plan to reduce the number of on-shift and Emergency Response Organization (ERO) positions commensurate with the hazards associated with a permanently shutdown and defueled facility.

The discussion below addresses each of these criteria and demonstrates that the proposed amendment does not constitute a significant hazard.

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 Emergency Plan do not impact the function of plant Structures, Systems, or Components (SSCs). The proposed changes do not involve the modification of any plant equipment or affect plant operation. The proposed changes do not affect accident initiators or precursors, nor do the proposed changes alter design assumptions. The proposed changes do not prevent the ability of the on-shift staff and ERO to perform their intended functions to mitigate the consequences of any accident or event that will be credible in the permanently defueled condition. The proposed changes only remove positions that will no longer be needed or credited in the Emergency Plan in the permanently defueled condition.

Therefore, the proposed changes 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 reduce the number of on-shift and ERO positions commensurate with the hazards associated with a permanently shutdown and defueled facility. The proposed changes do not involve installation of new equipment or modification of existing equipment, so that no new equipment failure modes are introduced. Also, the proposed changes do not result in a change to the way that the equipment or facility is operated so that no new accident initiators are created.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any 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. The proposed changes are associated with the Emergency Plan and 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 the proposed changes and margins of safety are maintained. The revised Emergency Plan will continue to provide the necessary response staff with the proposed changes.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, Exelon concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

6.4 Conclusion

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 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.

7.0 ENVIRONMENTAL CONSIDERATION

This amendment request meets the eligibility criteria for categorical exclusion from environmental review set forth in 10 CFR 51.22(c)(9) as follows:

(i) The amendment involves no significant hazards consideration.

As described in Section 6.3 of this evaluation, the proposed changes involve no significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

The proposed changes do not involve any physical alterations to the plant configuration or any changes to the operation of the facility that could lead to a change in the type or amount of effluent release offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes do not involve any physical alterations to the plant configuration or any changes to the operation of the facility that could lead to a significant increase in individual or cumulative occupational radiation exposure.

Based on the above, Exelon concludes that the proposed change meets the eligibility criteria for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

8.0 REFERENCES

1. Letter from J. Bradley Fewell (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations for Byron Station, Units 1 and 2," dated September 2, 2020 (Accession No. ML20246G613)

2. Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changes to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (Accession No. ML20269A401)

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, published November 1980 (Accession No. ML040420012)

4. Federal Register Volume 76, Number 226, Wednesday, November 23, 2011, Rules and Regulations, "Enhancements to Emergency Preparedness Regulations; Final Rule"

5. NRC NSIR/DPR-ISG-01, "Interim Staff Guidance - Emergency Planning for Nuclear Power Plants," Revision 0, November 2011 (Accession No. ML113010523)

6. NEI 10-05, Rev. 0, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," June 2011 (Accession No. ML111751698)

7. NRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," Revision 4, July 2003 (Accession No. ML032020276)

8. NRC Regulatory Guide 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors," Revision 0, November 2011 (NRC Accession No. ML102510626)

9. NRC Regulatory Issue Summary 2005-02, "Clarifying the Process for Making Emergency Plan Changes," Revision 1, April 19, 2011 (Accession No. ML100340545)

10. Letter from U.S. Nuclear Regulatory Commission to Entergy Nuclear Operations, Inc., "Vermont Yankee Nuclear Power Station – Issuance of Amendment to Renewed Facility Operating License Re: Changes to the Emergency Plan (TAC No. MF3668)," dated February 4, 2015 (Accession No. ML14346A065)

11. Letter from U.S. Nuclear Regulatory Commission to Florida Power & Light Company, "Duane Arnold Energy Center - Issuance of Amendment No. 310 RE: Changes to the Post-Shutdown Emergency Plan for Duane Arnold Energy Center (EPID L-2019-LLA-0075)," dated April 29, 2020 (Accession No. ML20083G008)

12. Final Response to Emergency Preparedness Frequently Asked Question 2013-008, dated January 27, 2014 (NRC Accession No. ML14017A276)

13. NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 2, dated December 2019 (Accession No. ML19347D139)

14. Letter from James Barstow, Exelon Generation Company, LLC to U.S. Nuclear Regulatory Commission – "License Amendment Request for Approval of Changes to Emergency Plan Staffing Requirements," dated January 31, 2018 (Accession No. ML18053A159)

15. Letter from U.S. Nuclear Regulatory Commission to Exelon Generation Company, LLC, “Braidwood Station, Units 1 and 2; Byron Station, Unit Nos. 1 and 2; Clinton Power Station, Unit No. 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 - Issuance of Amendments To Revise the Emergency Response Organization Staffing Requirements, dated March 21, 2019. (Accession No. ML19036A586)

16. Letter from U.S. Nuclear Regulatory Commission to Ms. Susan Perkins-Grew, Nuclear Energy Institute (NEI), "Alternative Guidance for Licensee Emergency Response Organizations," dated June 12, 2018. (Accession No. ML18022A352)

17. Technical Basis for The Proposed Guidance In NUREG-0654/FFEMA-REP-1, Section II.B, "Emergency Response Organization," July 2017 (Accession No: ML16117A427)

Attachment 2

Byron Station

TABULAR SUMMARY OF PROPOSED CHANGES TO SITE EMERGENCY PLAN

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TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Note: Regarding the format of this table, deleted text is indicated by ~~strike-through~~; added text is indicated by **Bold** font.

EP-BY-1000

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
EP-BY-1000	**Note: This table provides a summary of changes to documents comprising the Byron Emergency Plan: EP-BY-1000.** Besides the changes associated with the permanent shutdown evaluated below, there are multiple editorial changes that are proposed in this license amendment request, i.e., they do not change the intent of the document. They do not impact the ability to comply with Regulatory Guidance or level of commitments made in the Emergency Plan. These changes are marked with revision bars within the Emergency Plan (except changes to step numbers); however, they are not specifically evaluated in the change assessment, since they are editorial. These include: • Changes in step numbers as a result of information which has been relocated or deleted • Page number changes within the Table of Contents • Changes in the Table of Contents which reflect changes made within the Plan • Changes in Revision numbering and Revision History		
EP-BY-1000 Part II Section A.2.a Byron Nuclear Emergency Response Organization	IEMA **Technical** has both the command authority for radiological aspects of a nuclear incident and the responsibility for performing various radiological functions. These functions include milk, water and food control, radiation exposure control for state emergency workers, and confirmatory accident assessment. During an emergency situation, IEMA Technical shall make protective action recommendations to the Governor.	IEMA ~~Technical~~ has both the command authority for radiological aspects of a nuclear incident and the responsibility for performing various radiological functions. These functions include milk, water and food control, radiation exposure control for state emergency workers, and confirmatory accident assessment. During an emergency situation, IEMA Technical shall make protective action recommendations to the Governor.	The revision replaces the reference to the IEMA Technical branch. The change was made at the request of IEMA based on changes to their Organization Structure. The IEMA Technical group no loner exists.
EP-BY-1000 Part II Section A, Fig. A-2 Byron Nuclear Emergency Response Organization	**Figure A-2: Agency Response Organization Interrelationships** Dept of Safety / Rad Protection	**Figure A-2: Agency Response Organization Interrelationships** ~~Dept of Safety / Rad Protection~~	The revision deletes the reference to the Dept of Safety / Rad Protection group. The change was made at the request of IEMA based on changes to their Organization Structure. The Dept of Safety / Rad Protection group no longer exists.

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Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
EP-BY-1000 Part II Section B Byron Nuclear Emergency Response Organization	Section B: Exelon Nuclear Emergency Response Organization This section describes the Exelon Nuclear Emergency Response Organization (ERO), its key positions and associated responsibilities. <…>	Section B: ~~Exelon~~**Byron** Nuclear Emergency Response Organization This section describes the ~~Exelon~~**Byron** Nuclear Emergency Response Organization (ERO), its key positions and associated responsibilities. <…>.	The revision replaces Exelon with Byron as it pertains to Nuclear Response Organization. EP functions for the Byron Emergency Response Organization will continue to be maintained.
EP-BY-1000 Part II Section B.1 On Shift Emergency Response Organization Assignments	1. On Shift Emergency Response Organization Assignments The normal plant personnel complement is established with the Station Vice President having overall authority for station operations. The Station Vice President directs the site organization in the management of the various departments while the Shift Manager retains the responsibility for actual operation of plant systems. <…>	1. On Shift Emergency Response Organization Assignments The normal plant personnel complement is established with the Station ~~Vice President~~**Plant Manager** having overall authority for station operations. The Station ~~Vice President~~**Plant Manager** directs the site organization in the management of the various departments while the Shift Manager retains the responsibility for actual operation of plant systems. <…>	The revision replaces the Station Vice President with the Plant Manager as having overall authority and directing the site organization. This change is in alignment with the site staffing changes being made in the Byron Technical Specifications (TS), Administrative Controls License Amendment Request (LAR).[1]
EP-BY-1000 Part II Section B.1 On Shift Personnel	Shift Technical Advisor (STA): During normal plant operations, the Senior Reactor Operators report to the Shift Manager and directly supervise the licensed Reactor Operators and all activities in the Control Room. During an abnormal condition, the Shift Manager assumes direct supervision of personnel and all activities in the Control Room while a qualified individual steps back and assumes an overview role as an STA with the specific responsibility of monitoring the maintenance of core cooling and containment integrity. An individual assigned the duty as the STA shall be available to the Control Room at all times.	~~Shift Technical Advisor (STA): During normal plant operations, the Senior Reactor Operators report to the Shift Manager and directly supervise the licensed Reactor Operators and all activities in the Control Room. During an abnormal condition, the Shift Manager assumes direct supervision of personnel and all activities in the Control Room while a qualified individual steps back and assumes an overview role as an STA with the specific responsibility of monitoring the maintenance of core cooling and containment integrity. An individual assigned the duty as the STA shall be available to the Control Room at all times.~~	The revision deletes reference to Shift Technical Advisor and aligns with staffing changes in Byron TS, Administrative Controls LAR[2]. Byron will no longer be an operating nuclear power plant. The STA function for a permanently shutdown reactor is no longer required. EP functional requirements for Technical Support will be performed by Shift Manager / Certified Fuel Handler (CFH). Refer to Attachment 1, Section 5.3.7 for further discussion of the STA.

[1] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)
[2] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)

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Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
EP-BY-1000 Part II Section B.5.a Station Emergency Response Organization	a. Station Emergency Response Organization <…> When plant conditions warrant entry into the Severe Accident Management Guidelines (SAMGs), On-shift staff or TSC Minimum staff ERO may assume the roles of Decision-Maker and Evaluators as directed by station procedures.	a. Station Emergency Response Organization <…> ~~When plant conditions warrant entry into the Severe Accident Management Guidelines (SAMGs), On-shift staff or TSC Minimum staff ERO may assume the roles of Decision-Maker and Evaluators as directed by station procedures.~~	The revision removes reference to SAMGs. SAMG scenarios are no longer applicable or required in the permanently defueled condition.
EP-BY-1000 Part II Section B.5.a.1 Shift Manager (Shift Emergency Director) Control Room	1) Shift Manager (Shift Emergency Director) - Control Room <…> The Shift Manager's responsibilities, when not in Command and Control, are described below: • The authority and responsibility to shut down the reactor when determined that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection circuit set-points and automatic shutdown does not occur; • To ensure a review has been completed to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction; • The responsibility to be present at the plant and to provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction; <…>	1) Shift Manager (Shift Emergency Director) - Control Room <…> The Shift Manager's responsibilities, when not in Command and Control, are described below: • ~~The authority and responsibility to shut down the reactor when determined that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection circuit set-points and automatic shutdown does not occur;~~ • ~~To ensure a review has been completed to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction;~~ • ~~The responsibility to be present at the plant and to provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction;~~ <…>	The revision reflects that the duties of the Shift Manager no longer include shutting down the reactor or review prior to returning to power. The permanent shutdown of the Byron reactor makes these responsibilities unnecessary within the Emergency Plan.

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EP-BY-1000 Part II Section B.5.a.5 Technical Support Staff - TSC	5) Technical Support Staff TSC The TSC Technical Support Staff consists of the following minimum staff engineering positions: - Electrical Engineer - Mechanical Engineer - Core/Thermal Hydraulic Engineer - serves as Core Damage Assessment Methodology (CDAM) Evaluator, as applicable. In addition, station Engineering support will be augmented on an as needed basis to support accident assessment and mitigation activities.	5) Technical Support Staff TSC The TSC Technical Support Staff consists of the following minimum staff engineering position~~s~~: - **TSC** ~~Electrical~~ Engineer ~~- Mechanical Engineer~~ ~~- Core/Thermal Hydraulic Engineer - serves as Core Damage Assessment Methodology (CDAM) Evaluator, as applicable~~. In addition, station Engineering support will be augmented on an as needed basis to support accident assessment and mitigation activities.	The TSC discipline specific Engineering positions are being combined into the TSC Engineer position. This revision is further discussed in Attachment 1, Section 5.3.7, Evaluation of Proposed Changes. Evaluation of this ERO position's responsibilities is performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned.
EP-BY-1000 Part II Section B.5.a.8 Operations Support Center Director OSC	8) Operations Support Center Director OSC The OSC Director reports to the Emergency Director and supervises the activities of OSC personnel. Responsibilities include: • Assign tasks to designated Leads as available: - I&C Maintenance - Mechanical Maintenance - Electrical Maintenance - Radiation Protection <…>	8) Operations Support Center Director OSC The OSC Director reports to the Emergency Director and supervises the activities of OSC personnel. Responsibilities include: • Assign tasks ~~to designated Leads~~ as available: - I&C Maintenance - Mechanical Maintenance - Electrical Maintenance - Radiation Protection <…>	The revision deletes the OSC I&C, Mechanical Maintenance and Electrical Maintenance Lead positions. These OSC technicians will be supervised by the OSC Director. The pooled positions will consist of Mechanical, Electrical, and I&C Technicians. Radiation Protection (RP) Technicians will be supervised by the RP Supervisor/Lead. This revision is further discussed in Attachment 1, Section 5.3.10, Evaluation of Proposed Changes. Evaluation of these ERO position's responsibilities are performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned. The re-assignment of ERO responsibilities will be further
EP-BY-1000 Part II Section B.5.a.9 OSC Leads OSC	9) OSC Leads OSC OSC Leads report to the OSC Director and are assigned from the following station departments: • Mechanical Maintenance • Electrical Maintenance • Instrument and Control • Radiation Protection The OSC Lead assigned to an OSC team is responsible at all times for the safety of team personnel	9) OSC **RP** Lead~~s~~ OSC ~~OSC Leads and report to the OSC Director and are assigned from the following station departments:~~ ~~• Mechanical Maintenance~~ ~~• Electrical Maintenance~~ ~~• Instrument and Control~~ ~~• Radiation Protection~~ The OSC **RP** Lead assigned ~~to an OSC team~~ is responsible at all times for the safety of team	

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	and to keep the OSC Director apprised of team status. Specifically, the OSC Leads are responsible for the managing and supervising OSC team personnel, including: • Conduct of adequate pre-dispatch briefings. • Ensuring adequate protective equipment and measures have been identified. • Tracking of OSC team activities while dispatched. • Debriefing of team personnel upon return to the OSC.	personnel and to keep the OSC Director apprised of team status. Specifically, the OSC **RP** Lead~~s~~ are responsible for the managing and supervising ~~OSC team~~ **RP** personnel, including: • Conduct of adequate pre-dispatch briefings. • Ensuring adequate protective equipment and measures have been identified. • Tracking of OSC team activities while dispatched. • Debriefing of team personnel upon return to the OSC.	demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).
EP-BY-1000 Part II Step B.8.a Industry/Private Support Organizations	a. Institute of Nuclear Power Operations (INPO): Experience has shown that a utility may need resources beyond in-house capabilities for the recovery from a nuclear plant emergency. One of the roles of the Institute of Nuclear Power Operations (INPO) is to assist affected utilities by quickly applying the resources of the nuclear industry to meet the needs of an emergency. INPO has an emergency response plan that enables it to provide the following emergency support functions: • Assistance to the affected utility in locating sources of emergency personnel, equipment and operational analysis. • INPO, Electric Power Research Institute (EPRI) and Nuclear Energy Institute (NEI) maintain a coordination agreement on emergency information with their member utilities. • INPO provides the "Nuclear Network", or its replacement, electronic communications system to its members, participants, NEI, and EPRI to coordinate the flow of media and technical information about the emergency. • Exelon Nuclear may obtain utility industry information and assistance from any party to this agreement through the coordination of INPO.	a. **Deleted** ~~Institute of Nuclear Power Operations (INPO): Experience has shown that a utility may need resources beyond in-house capabilities for the recovery from a nuclear plant emergency. One of the roles of the Institute of Nuclear Power Operations (INPO) is to assist affected utilities by quickly applying the resources of the nuclear industry to meet the needs of an emergency. INPO has an emergency response plan that enables it to provide the following emergency support functions:~~ • ~~Assistance to the affected utility in locating sources of emergency personnel, equipment and operational analysis.~~ • ~~INPO, Electric Power Research Institute (EPRI) and Nuclear Energy Institute (NEI) maintain a coordination agreement on emergency information with their member utilities.~~ • ~~INPO provides the "Nuclear Network", or its replacement, electronic communications system to its members, participants, NEI, and EPRI to coordinate the flow of media and technical information about the emergency.~~ • ~~Exelon Nuclear may obtain utility industry information and assistance from any party to this agreement through the coordination of INPO.~~	The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.

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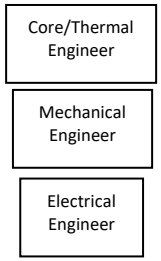
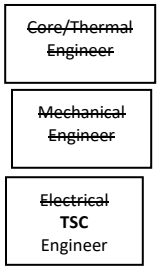
	To support these functions, INPO maintains the following emergency support capabilities: • A dedicated emergency call number. • Designated INPO representative(s) who can be quickly dispatched to the utility emergency response organization to coordinate INPO support activities and information flow. • The 24-hour per day operation of an Emergency Response Center at INPO headquarters. Exelon Nuclear will notify INPO (via the designated emergency call number) for all situations involving an Alert, Site Area Emergency, or General Emergency declaration per the Exelon Nuclear Reportability Manual. INPO has coordinated the preparation of a Voluntary Assistance Agreement for Transportation Accidents. Exelon Nuclear has signed this agreement which establishes the rights and responsibilities of electric utilities in requesting or providing assistance for response to a nuclear materials Transportation Accident.	~~To support these functions, INPO maintains the following emergency support capabilities:~~ ~~• A dedicated emergency call number.~~ ~~• Designated INPO representative(s) who can be quickly dispatched to the utility emergency response organization to coordinate INPO support activities and information flow.~~ ~~• The 24-hour per day operation of an Emergency Response Center at INPO headquarters.~~ ~~Exelon Nuclear will notify INPO (via the designated emergency call number) for all situations involving an Alert, Site Area Emergency, or General Emergency declaration per the Exelon Nuclear Reportability Manual.~~ ~~INPO has coordinated the preparation of a Voluntary Assistance Agreement for Transportation Accidents. Exelon Nuclear has signed this agreement which establishes the rights and responsibilities of electric utilities in requesting or providing assistance for response to a nuclear materials Transportation Accident.~~	
EP-BY-1000 Part II Figure B-1a	Figure B-1a: Exelon Overall ERO Command Structure	Figure B-1a: ~~Exelon~~ **Byron** Overall ERO Command Structure	The revision replaces Exelon with Byron as it pertains to the Overall ERO Command Structure. EP functions for the Byron ERO command structure will continue to be maintained.
EP-BY-1000 Part II Figure B-1b	Figure B-1b: Emergency Onsite Organization 	Figure B-1b: Emergency Onsite Organization 	The TSC Core/Thermal, Mechanical, and Electrical Engineer positions are being deleted from the Byron ERO and are being replaced by the TSC Engineer. This revision is further discussed in Attachment 1, Section 5.3.7 Evaluation of Proposed Changes. The revision also deletes the OSC I&C, Electrical and

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	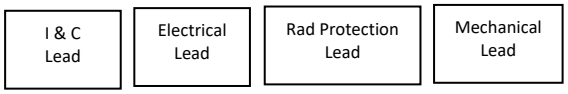	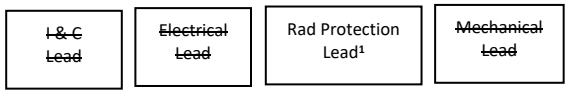 **[1] Rad Protection Lead responsibilities will be performed by a Rad Protection Pool responder as a collateral function.**	Mechanical Lead positions. The pooled positions consist of Mechanical, Electrical, and I&C technicians. The Pooled OSC technicians will be supervised by the OSC Director. The Radiation Protection Supervisor/Lead position will be performed as a collateral function by of one of the Pooled RP Technicians. This revision is further discussed in Attachment 1, Section 5.3.10, Evaluation of Proposed Changes. Evaluation of these ERO position's responsibilities are performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned.
Part II.D.1.b Emergency Classification System - Alert	<…> • Notification of INPO and ANI. <…>	<…> • Notification of ~~INPO and~~ ANI. <…>	The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.
Part II.D.1.d Emergency Classification System – General Emergency	d. <u>General Emergency</u> - Event(s) are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area. <…>	d. <u>General Emergency</u> - Event(s) are in process or have occurred which involve actual or imminent substantial ~~core~~ **fuel** degradation or melting ~~with potential for loss of containment integrity~~ or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area. <…>	This revision removes the potential for core degradation (and replaces it with fuel degradation) and for loss of containment integrity. The permanent shutdown and removal of fuel of the Byron reactor makes this condition unnecessary within the Emergency Plan. Fuel

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			degradation within the Spent Fuel Pool is considered.
Part II.D.1.e Emergency Classification System – Recovery	<…> • INPO and ANI are notified of Recovery classification.	<…> • ~~INPO and~~ ANI ~~are~~ **is** notified of Recovery classification.	The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.
Part II.D.2 Emergency Action Level Technical Bases	<…> An emergency is classified after assessing abnormal plant conditions and comparing them to EAL Threshold Values for the appropriate Initiating Conditions. Classifications are based on the evaluation of each unit for multi-reactor sites. Matrix tables organized by recognition categories are used to facilitate the comparison. The matrix tables are used when the unit is in the Technical Specification defined modes of Power Operations, Hot Standby, Hot Shutdown (for classifications purposes, startup evolutions are included in the Power Operations mode) and Cold Shutdown or Refueling (for classification purposes a defueled plant will be considered in the Refueling mode). <…>	<…> An emergency is classified after assessing abnormal plant conditions and comparing them to EAL Threshold Values for the appropriate Initiating Conditions. Classifications are based on the evaluation of each unit for multi-reactor sites. Matrix tables organized by recognition categories are used to facilitate the comparison. ~~The matrix tables are used when the unit is in the Technical Specification defined modes of Power Operations, Hot Standby, Hot Shutdown (for classifications purposes, startup evolutions are included in the Power Operations mode) and Cold Shutdown or Refueling (for classification purposes a defueled plant will be considered in the Refueling mode).~~ <…>	This revision removes matrix tables related to plant operating modes. The permanent shutdown and defueling of the Byron reactor makes the operating matrices unnecessary within the Emergency Plan.
Part II.D.3 Timely Classification of Events	<…> A qualified EAL assessor means any member of the plant staff who, by training and experience, is qualified to assess the indications or reports for validity and to compare the same to the EALs. A qualified EAL assessor may be, but need not be, a licensed operator or member of the ERO. Qualified EAL assessors may be in the MCR or in another facility where emergency declarations are performed. A qualified EAL assessor does not include personnel such as chemists, radiation protection technicians, craft personnel, security personnel, and others whose positions require they report, rather than assess, abnormal conditions to the MCR. <…>	<…> A qualified EAL assessor means any member of the plant staff who, by training and experience, is qualified to assess the indications or reports for validity and to compare the same to the EALs. A qualified EAL assessor may be, but need not be, a ~~licensed operator~~ **Certified Fuel Handler, Non-Certified Operator** or member of the ERO. Qualified EAL assessors may be in the MCR or in another facility where emergency declarations are performed. A qualified EAL assessor does not include personnel such as chemists, radiation protection technicians, craft personnel, security personnel, and others whose positions require they report, rather than assess, abnormal conditions to the MCR. <…>	The revision replaces "licensed operator" with "Certified Fuel Handler, Non-Certified Operator." This change is in alignment with the site staffing changes being made in the Byron Technical Specifications (TS), Administrative Controls License Amendment Request (LAR).[3]

[3] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)

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Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
Part II.E.2.b.2 Notification and Mobilization of Emergency Response Personnel - Nuclear Regulatory Commission (NRC)	<…> The computerized data link to the NRC, referred to as the Emergency Response Data System (ERDS), continuously supplies specified plant data to the NRC. <…>	<…> ~~The computerized data link to the NRC, referred to as the Emergency Response Data System (ERDS), continuously supplies specified plant data to the NRC.~~ <…>	This revision removes the computer data link to the NRC (ERDS). The permanent shutdown of the Byron reactor makes ERDS references unnecessary within the Emergency Plan.
Part II.E.2.c Notification and Mobilization of Emergency Response Personnel – Support Organizations	<…> • The Institute of Nuclear Power Operations (INPO) is notified at an Alert or higher classification with requests for assistance as necessary. <…>	<…> • ~~The Institute of Nuclear Power Operations (INPO) is notified at an Alert or higher classification with requests for assistance as necessary.~~ <…>	The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.
Part II.E.6 Notification of the Public	The ANS is operated by local governmental agencies and maintained by Exelon Nuclear. To assure the ANS is maintained in an operational readiness posture, the local agencies have agreed to test the system (by sounding the sirens) on a periodic basis that meets or exceeds FEMA guidance and to report inoperable equipment to EP designated maintenance personnel. The goal of the testing and maintenance program is to identify inoperable equipment in a timely manner and to restore equipment to a functional status commensurate with FEMA operability requirements as referenced in FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants" **Section E.6.2.1**. In addition to this routine test and repair program, preventive maintenance of the ANS will be performed on an annual basis.	The ANS is operated by local governmental agencies and maintained by Exelon Nuclear. To assure the ANS is maintained in an operational readiness posture, the local agencies have agreed to test the system (by sounding the sirens) on a periodic basis that meets or exceeds FEMA guidance and to report inoperable equipment to EP designated maintenance personnel. The goal of the testing and maintenance program is to identify inoperable equipment in a timely manner and to restore equipment to a functional status commensurate with FEMA operability requirements as referenced in FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants" ~~Section E.6.2.1~~. In addition to this routine test and repair program, preventive maintenance of the ANS will be performed on an annual basis.	The revision deletes the reference to FEMA Rep 10 specific Step number E.6.2.1. The procedure has subsequently been revised and the step number is no longer applicable. FEMA Rep 10 is still retained as an appropriate reference.
Part II.F.1.b-d.1 Communications/ Notifications - Emergency Response Data System (ERDS	1) Nuclear Accident Reporting System (NARS): The NARS is a dedicated communications system that has been installed for the purpose of notifying state and local authorities of declared nuclear emergencies. This system links together the station Control Rooms, the EOF, TSCs and state and local authorities as appropriate. The specific design, operation, and responsibility for maintenance of the NARS systems	1) Nuclear Accident Reporting System (NARS): The NARS is a dedicated communications system that has been installed for the purpose of notifying state and local authorities of declared nuclear emergencies. This system links together the station Control Rooms, the EOF, TSCs and state and local authorities as appropriate. ~~The specific design, operation, and responsibility for maintenance of the NARS systems vary between Exelon~~	The revision removes reference to other station's NARs systems, as well as reference to the North East region's RECS systems. Both references are no longer applicable to the station specific Emergency Plan.

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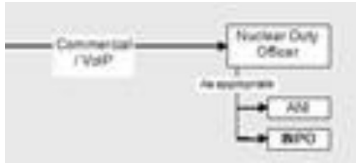
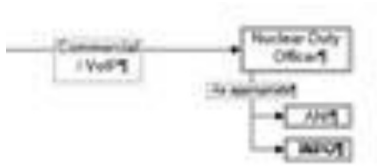
	vary between Exelon Nuclear regions. Note that some stations refer to NARS as Radiological Emergency Communications System (RECS).	~~Nuclear regions. Note that some stations refer to NARS as Radiological Emergency Communications System (RECS).~~	
Part II.F.1.b-d.5 Communications/ Notifications - Emergency Response Data System (ERDS)	5) Emergency Response Data System (ERDS): ERDS will continuously supply the NRC with selected plant data points on a near real time basis. The selected data points are transmitted automatically to the NRC at approximately 1-minute intervals.	~~5) Emergency Response Data System (ERDS): ERDS will continuously supply the NRC with selected plant data points on a near real time basis. The selected data points are transmitted automatically to the NRC at approximately 1-minute intervals.~~	This revision removes the computer data link to the NRC (ERDS) as communication portal. The permanent shutdown of the Byron reactor makes ERDS references unnecessary within the Emergency Plan.
Part II, Figure F-1 Exelon Notification Scheme (For Full Augmentation)			The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility
Part II.H.1.a Control Room, Technical Support Center, and Operations Support Center - Station Control Room	a. Station Control Room: The Control Room is the centralized onsite location from which the Nuclear Station's reactors and major plant systems are operated. The Control Room is equipped with instrumentation to supply detailed information on the reactors and major plant systems. The Control Room is continuously staffed with qualified licensed operators. The Control Room is the first onsite facility to become involved with the response to emergency events. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency until such time that support centers can be activated. These activities shall include: • Reactor and plant control. <…>	a. Station Control Room: The Control Room is the centralized onsite location from which the Nuclear Station's ~~reactors and major~~ plant systems **necessary to support the spent fuel pool** are **monitored** ~~operated~~. The Control Room is equipped with instrumentation to supply detailed information on the ~~reactors and major~~ plant systems. The Control Room is continuously staffed with qualified ~~licensed~~ operators. The Control Room is the first onsite facility to become involved with the response to emergency events. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency until such time that support centers can be activated. These activities shall include: • ~~Reactor and~~ **P**lant control. <…>	This revision removes the reference to the site reactors and major plant equipment. The permanent shutdown of the Byron reactor makes these condition reference unnecessary within the Emergency Plan.
Part II.H.1.b Control Room, Technical Support Center, and	<…> The TSC has access to a complete set of as-built drawings and other records, including general arrangement diagrams, P&IDs, and the electrical schematics. The TSC	<…> The TSC has access to a complete set of as-built drawings and other records, including general arrangement diagrams, P&IDs, and the electrical schematics. The TSC has the	This revision removes the reference to the reactor operation.

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Operations Support Center – Technical Support Center	has the capability to record and display vital plant data, in real time, to be used by knowledgeable individuals responsible for engineering and management support of reactor operations, and for implementation of emergency procedures.	capability to record and display vital plant data, in real time, to be used by knowledgeable individuals responsible for engineering and management support of ~~reactor~~ operations, and for implementation of emergency procedures.	The permanent shutdown of the Byron reactor makes this condition unnecessary within the Emergency Plan.
Part II.H.5.a.1 Monitoring Equipment Onsite - Meteorological Instrumentation	<…> With regard to Exelon Nuclear's meteorological monitoring program, there has been a quality assurance program adopted from 10 CFR 50, Appendix B. However, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are not "safety related," not all aspects of 10 CFR 50, Appendix B, apply. Those aspects of quality assurance germane to supplying good meteorological information for a nuclear power station were adopted into the meteorological quality assurance program. The meteorological program is also subject to the requirements of the QATR, Section 19, Augmented Quality. <…>	<…> With regard to Exelon Nuclear's meteorological monitoring program, there has been a quality assurance program adopted from 10 CFR 50, Appendix B. However, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are not "safety related," not all aspects of 10 CFR 50, Appendix B, apply. Those aspects of quality assurance germane to supplying good meteorological information for a nuclear power station were adopted into the meteorological quality assurance program. The meteorological program is also subject to the requirements of the **Decommissioning Quality Assurance Program** ~~QATR, Section 19, Augmented Quality~~. <…>	This revision changes the quality assurance program reference based on the permanent shutdown of the Byron reactors. The Station's QATR is replaced by the Decommissioning Quality Assurance Program
Part II.H.5.b.1.c Radiological Monitors and Sampling	<…> c) The accident, or high range, radiation monitoring system monitors radiation levels at various locations within the operating area. These are high range instruments used to track radiation levels under accident or post accident conditions. These instruments include the Containment/Drywell Radiation Monitors. <…>	<…> c) The accident, or high range, radiation monitoring system monitors radiation levels at various locations within the operating area. These are high range instruments used to track radiation levels under accident or post accident conditions. ~~These instruments include the Containment/Drywell Radiation Monitors.~~ <…>	This revision removes the instruments that monitor containment radiation. The permanent shutdown and removal of fuel of the Byron reactor makes these instrument references unnecessary within the Emergency Plan.
Part II.H.5.b.2 Liquid and Gaseous Sampling Systems:	2) Liquid and Gaseous Sampling Systems: The process sampling system consists of the normal sampling system and additional sampling panels located throughout the plant. Sampling systems are installed or can be modified to permit reactor coolant and containment atmosphere sampling even under severe accident conditions. The sampling systems use a number of manual sampling techniques to enable reactor coolant and	2) Liquid and Gaseous Sampling Systems: The process sampling system consists of the normal sampling system and additional sampling panels located throughout the plant. Sampling systems are installed or can be modified to permit ~~reactor coolant and containment atmosphere~~ sampling even under severe accident conditions. The sampling systems use a number of manual sampling techniques to enable ~~reactor coolant and containment~~ sampling operations over a wide range of plant	This revision removes sampling requirements for reactor coolant and containment. The permanent shutdown of the Byron reactors and defueled status makes these sampling references unnecessary within the Emergency Plan.

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	containment sampling operations over a wide range of plant conditions. It is capable of providing information relative to post-accident plant conditions to allow operator actions to be taken to mitigate and control the course of an accident. Refer to the specific UFSAR for further detail on sampling capabilities.	conditions. It is capable of providing information relative to post-accident plant conditions to allow operator actions to be taken to mitigate and control the course of an accident. Refer to the specific UFSAR for further detail on sampling capabilities.	
Part II.H.5.c Process Monitors	c. Process Monitors: The Control Room and applicable redundant backup locations are equipped with extensive plant process monitors for use in both normal and emergency conditions. These indications include but are not limited to reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates, status or lineup of equipment components. This instrumentation provides the basis for initiation of corrective actions.	c. Process Monitors: The Control Room and applicable redundant backup locations are equipped with extensive plant process monitors for use in both normal and emergency conditions. These indications include but are not limited to ~~reactor coolant system pressure and temperature, containment pressure and temperature,~~ liquid levels, flow rates, status or lineup of equipment components. This instrumentation provides the basis for initiation of corrective actions.	This revision removes indications for the reactor coolant system and containment parameters. The permanent shutdown of the Byron reactors and defueled status makes these indication references unnecessary within the Emergency Plan.
Part II.I.1 Plant Parameters and Corresponding Emergency Classification	<…> The SPDS monitors such parameters as: reactor coolant system pressure, reactor or pressurizer water level, containment pressure, suppression pool water level and temperature, reactor power, safety system status, containment radiation level and effluent monitor readings. The instrumentation and equipment capabilities available for each emergency facility are described in Section H	<…> The SPDS monitors such parameters as: ~~reactor coolant system pressure, reactor or pressurizer water level, containment pressure, suppression pool water level and temperature, reactor power,~~ safety system status, ~~containment radiation level~~ and effluent monitor readings. The instrumentation and equipment capabilities available for each emergency facility are described in Section H	This revision removes indications that SPDS provides for the reactor coolant system and containment parameters. The permanent shutdown of the Byron reactors and defueled status makes these indications unnecessary within the Emergency Plan.
Part II.I.2 Onsite Accident Assessment Capabilities	**2. Onsite Accident Assessment Capabilities** The resources available to provide initial and continuing information for accident assessment throughout the course of an event include plant parameter display systems, liquid and gaseous sampling system, Area and Process Radiation Monitoring Systems, and Accident Radiation Monitoring Systems (which includes the high range containment radiation monitors). Descriptions of these systems are given in Section H.5.b.	***2. Onsite Accident Assessment Capabilities*** The resources available to provide initial and continuing information for accident assessment throughout the course of an event include plant parameter display systems, liquid and gaseous sampling system, Area and Process Radiation Monitoring Systems, and Accident Radiation Monitoring Systems ~~(which includes the high range containment radiation monitors)~~. Descriptions of these systems are given in Section H.5.b.	This revision removes the instruments that monitor containment radiation. The permanent shutdown and removal of fuel of the Byron reactors and their defueled status makes this accident assessment capability unnecessary within the Emergency Plan.
Part II.I.3 Source Term Determination	**3. Source Term Determination** Source term (or core damage) estimations serve several roles within the Exelon Emergency Preparedness Program. For planning purposes, core damage	**3. Source Term Determination** Source term (or ~~core~~ **fuel** damage) estimations serve several roles within the Exelon Emergency Preparedness Program. For planning purposes, ~~core~~ **fuel** damage	This revision removes the possibility of the reactor core as source term and affected assessment methodologies.

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	considerations are used as the bases for several of the Emergency Action Level (EAL) Initiating Conditions and as the threshold for the declaration of a General Emergency (the definition of a General Emergency specifies conditions which involve 'substantial' core degradation or melting as one of the bases for classification). From an implementation perspective, core damage estimations provide a means of realistically differentiating between the four core states (no damage, clad failure, and fuel melt, and vessel melt-through) to: • Evaluate the status of the fuel barriers and how their status relates to the risks and possible consequences of the accident. • Provide input on core configuration (coolable or uncoolable) for prioritization of mitigating activities. • Determine the potential quality (type) and/or quantity (%) of source term available for release in support of projected offsite doses and protective action recommendations. • Provide information that quantifies the severity of an accident in terms that can be readily understood and visualized. • Support the determination of radiological protective actions that should be considered for long term recovery activities. The assessment methodologies utilized by Exelon are intended to provide a rapid best estimate of core damage which, when evaluated together, help to develop an overall picture of the extent of core damage. The methods used to estimate the amount or type of core damage occurring under accident conditions includes the following: • Containment Radiation Monitors: An indirect method used to determine the amount of core damage. Applicable to Loss of Coolant Accident (LOCA) scenarios. Based upon an end-of-life source term and static nuclide ratio assumptions yielding a limited accuracy. Valid any time following an accident. • Core Temperatures: Methods such as Core Exit Thermocouple (CET), Peak Core Temperatures and	considerations are used as the bases for several of the Emergency Action Level (EAL) Initiating Conditions and as the threshold for the declaration of a General Emergency (the definition of a General Emergency specifies conditions which involve 'substantial' ~~core~~ **fuel** degradation or melting as one of the bases for classification). From an implementation perspective, ~~core~~ **fuel** damage estimations provide a means of realistically differentiating between the **fuel** ~~four core~~ states (no damage, clad failure, and fuel melt~~, and vessel melt-through~~) to: • Evaluate the status of the fuel ~~barriers~~ **clad** and how their status relates to the risks and possible consequences of the accident. • Provide input on ~~core~~ **fuel** configuration (coolable or uncoolable) for prioritization of mitigating activities. • Determine the potential quality (type) and/or quantity (%) of source term available for release in support of projected offsite doses and protective action recommendations. • Provide information that quantifies the severity of an accident in terms that can be readily understood and visualized. • Support the determination of radiological protective actions that should be considered for long term recovery activities. The assessment methodologies utilized by ~~Exelon~~ **Byron** are intended to provide a rapid best estimate of ~~core~~ **fuel** damage which, when evaluated together, help to develop an overall picture of the extent of ~~core~~ **fuel** damage. ~~The methods used to estimate the amount or type of core damage occurring under accident conditions includes the following:~~ ~~• Containment Radiation Monitors: An indirect method used to determine the amount of core damage. Applicable to Loss of Coolant Accident (LOCA) scenarios. Based upon an end-of-life source term and static nuclide ratio assumptions yielding a limited accuracy. Valid any time following an accident.~~ ~~• Core Temperatures: Methods such as Core Exit Thermocouple (CET), Peak Core Temperatures and~~	The permanent shutdown of the Byron reactors and their defueled status makes the possibility of the reactor core as source term and affected assessment methodologies unnecessary within the Emergency Plan.

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	Hot Leg Temperatures provide indirect methods used to indicate the type and/or amount of core damage. Applicable for all types of accidents. Valid any time following an accident. • Core Uncovery: Methods such as Core Uncovery Time, RVLIS Level and Source Range Monitor count rate provide indirect methods used to indicate the type of core damage (clad failure or fuel melt). Applicable for all types of accidents. Provides a relatively accurate estimate of the state of the core early in the event. Valid any time following an accident. • Containment Hydrogen Concentration: An indirect method used to establish the type of core damage. Applicable to LOCA type accidents where all the hydrogen generated by the metal-water reaction is released into containment. Valid any time following an accident. • Sample Analysis - Isotopic Ratio Comparison: A direct method used to establish the type of core damage. Compares expected isotopic ratios with a sample to determine a general core state. Applicable under all types of accidents. Valid any time following an accident. • Sample Analysis - Presence of Abnormal Isotopes: A direct method used to provide a go/no go indication of fuel melt by the presence of unusually high concentrations of the less volatile fission products. Applicable under all types of accidents. Valid any time following an accident. • Sample Analysis - Concentration Evaluation: A direct method that yields the most accurate numerical estimations of the amount of core damage. Applicable for all types of accidents. Requires the sampled system(s) be in a steady state that usually prevents its use until the plant is in a stable condition.	~~Hot Leg Temperatures provide indirect methods used to indicate the type and/or amount of core damage. Applicable for all types of accidents. Valid any time following an accident.~~ • ~~Core Uncovery: Methods such as Core Uncovery Time, RVLIS Level and Source Range Monitor count rate provide indirect methods used to indicate the type of core damage (clad failure or fuel melt). Applicable for all types of accidents. Provides a relatively accurate estimate of the state of the core early in the event. Valid any time following an accident.~~ • ~~Containment Hydrogen Concentration: An indirect method used to establish the type of core damage. Applicable to LOCA type accidents where all the hydrogen generated by the metal-water reaction is released into containment. Valid any time following an accident.~~ • ~~Sample Analysis - Isotopic Ratio Comparison: A direct method used to establish the type of core damage. Compares expected isotopic ratios with a sample to determine a general core state. Applicable under all types of accidents. Valid any time following an accident.~~ • ~~Sample Analysis - Presence of Abnormal Isotopes: A direct method used to provide a go/no go indication of fuel melt by the presence of unusually high concentrations of the less volatile fission products. Applicable under all types of accidents. Valid any time following an accident.~~ • ~~Sample Analysis - Concentration Evaluation: A direct method that yields the most accurate numerical estimations of the amount of core damage. Applicable for all types of accidents. Requires the sampled system(s) be in a steady state that usually prevents its use until the plant is in a stable condition.~~	
Part II.I.4.b Effluent Monitor Data and Dose Projection	B. Containment Leakage/Failure - This method uses a variety of containment failures or leak rates in conjunction with available source term estimations to develop a release rate to the environment. A direct vent of containment can be modeled as a failure to isolate.	~~B. Containment Leakage/Failure - This method uses a variety of containment failures or leak rates in conjunction with available source term estimations to develop a release rate to the environment. A direct vent of containment can be modeled as a failure to isolate.~~	This revision removes the containment leakage/failure as an assessment methodology. The permanent shutdown of the Byron reactors and their defueled status makes this assessment

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			methodology unnecessary within the Emergency Plan.
Part II.J.10.m.1 Plant Based PARs	1) Plant Based PARs Station specific PAR Flowcharts have been developed to aid Exelon Nuclear personnel providing PARs based on the above. Station specific PAR Flowcharts with Subarea or Sector tables are documented in the Exelon EP Implementing Procedures, including station-specific requirements regarding PAR determination. These flowcharts and tables provide technically based Protective Action Recommendations based on plant conditions and core damage indicators as applicable to the Exelon site and described within the implementing procedures. Possible plant based PARs issued by Exelon Nuclear, in support of NUREG-0654 Supp. 3, at a General Emergency could include as appropriate for the Station: • Response to a Rapidly Progressing Severe Accident. • Utilization of the staged evacuation concept as determined by station ETE's. • Shelter of the general public in response to but not limited to; a controlled containment vent lasting less than 1 hour in duration less than PAGs, impediments to evacuation, or Hostile Action event. • Evacuation of the general public. <…>	1) Plant Based PARs Station specific PAR Flowcharts have been developed to aid Exelon Nuclear personnel providing PARs based on the above. Station specific PAR Flowcharts with Subarea or Sector tables are documented in the Exelon EP Implementing Procedures, including station-specific requirements regarding PAR determination. These flowcharts and tables provide technically based Protective Action Recommendations based on plant condition~~s and core damage~~ indicators as applicable to the Exelon site and described within the implementing procedures. Possible plant based PARs issued by Exelon Nuclear, in support of NUREG-0654 Supp. 3, at a General Emergency could include as appropriate for the Station: • Response to a Rapidly Progressing Severe Accident. • Utilization of the staged evacuation concept as determined by station ETE's. • Shelter of the general public in response to but not limited to~~; a controlled containment vent lasting less than 1 hour in duration less than PAGs,~~ impediments to evacuation~~,~~ or Hostile Action event. • Evacuation of the general public. <…>	This revision removes core damage indications and a controlled containment vent as they related to plant based PARs. The permanent shutdown of the Byron reactors and their defueled status makes these conditions unnecessary within the Emergency Plan.
Part II.M.1.b Evaluating Entry into Recovery	<…> • The reactor is in a stable shutdown condition and long-term core cooling is available • The fuel pool damage has been mitigated, or spent fuel damage has been contained and controlled. • Primary and/or secondary containment integrity has been established. <…>	<…> ~~• The reactor is in a stable shutdown condition and long-term core cooling is available~~ • The fuel pool damage has been mitigated, or spent fuel damage has been contained and controlled. ~~• Primary and/or secondary containment integrity has been established.~~ <…>	This revision removes reactor conditions and establishment of primary/secondary integrity. The permanent shutdown of the Byron reactors and their defueled status makes these conditions unnecessary within the Emergency Plan.

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Part II.M.2 Recovery Organization	**2. Recovery Organization** <…> • For events involving major damage to systems required to maintain safe shutdown of the plant and offsite radioactive releases have occurred, (i.e. for Site Area Emergency or General Emergency classifications) the station recovery organization is put in place. <…>	**2. Recovery Organization** <…> • For events involving major damage to systems ~~required to maintain safe shutdown of the plant and~~ **where** offsite radioactive releases have occurred, (i.e. for Site Area Emergency or General Emergency classifications) the station recovery organization is put in place. <…>	This revision removes systems to maintain the plant shutdown. The permanent shutdown of the Byron reactors and defueled status makes this condition unnecessary within the Emergency Plan.
Part II.N.2.e Health Physics Drills	e. Health Physics Drills: Health Physics Drills involving a response to, and analysis of, simulated airborne and liquid samples and direct radiation measurements within the plant are conducted semi-annually. At least annually, these drills shall include a demonstration of the sampling system capabilities, or the Core Damage Assessment Methodology (CDAM) objectives as applicable.	e. Health Physics Drills: Health Physics Drills involving a response to, and analysis of, simulated airborne and liquid samples and direct radiation measurements within the plant are conducted semi-annually. At least annually, these drills shall include a demonstration of the sampling system capabilities~~, or the Core Damage Assessment Methodology (CDAM) objectives as applicable~~.	This revision removes core damage assessment objectives. The permanent shutdown of the Byron reactors and defueled status makes reference to core damage assessment objectives unnecessary within the Emergency Plan.
Part II.O.4.b Personnel Responsible for Accident Assessment	b. Personnel Responsible for Accident Assessment: The skills and knowledge required to perform plant stabilization and mitigation are a normal function of operations specific positions, as identified in Section B of this plan. Power changes and planned and unplanned reactor shutdowns are handled on a normal operation basis. Subsequent plant stabilization and restoration is pursued utilizing normal operating procedures. Licensed Operators receive routine classroom and simulator training to ensure proficiency in this area. 1) Active Senior Licensed Control Room Personnel shall have training conducted in accordance with the approved ERO Training Program such that proficiency is maintained on the topics listed	b. Personnel Responsible for Accident Assessment: The skills and knowledge required to perform plant stabilization and mitigation are a normal function of operations specific positions, as identified in Section B of this plan. ~~Power changes and planned and unplanned reactor shutdowns are handled on a normal operation basis.~~ Subsequent plant stabilization and restoration is pursued utilizing normal operating procedures. ~~Licensed~~ **Qualified** Operators receive routine ~~classroom and simulator~~ training to ensure proficiency in this area. 1) ~~Active Senior Licensed Control Room Personnel~~ **Certified Fuel Handlers** shall have training conducted in accordance with the approved ERO Training Program such that proficiency is maintained on the topics listed below. These	This revision removes the personnel responsibilities of power changes, unplanned shutdowns, and core damage assessment. The permanent shutdown of the Byron reactors and defueled status makes these responsibilities unnecessary within the Emergency Plan. It also changes designation of responsibilities from active senior licensed to Certified Fuel Handlers. This change is in alignment with the site staffing

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	below. These subjects shall be covered as a minimum on an annual basis. <…> To remove peripheral duties from the Operations shift, the following group of positions responsible for accident assessment, corrective actions, protective actions, and related activities receive the training listed below: 2) Core Damage Assessment Personnel: During an emergency when core/cladding damage is suspected, a specialized group of trained individuals perform core damage assessment. At a minimum, personnel responsible for core damage assessment receive classroom and hands-on training in the following areas: • Available Instrumentation and Equipment • Isotopic Assessment and Interpretation • Computerized Core Damage Assessment Methodology (CDAM) and/or proceduralized assessment methods.	subjects shall be covered as a minimum on an annual basis. <…> ~~To remove peripheral duties from the Operations shift, the following group of positions responsible for accident assessment, corrective actions, protective actions, and related activities receive the training listed below:~~ ~~2) Core Damage Assessment Personnel: During an emergency when core/cladding damage is suspected, a specialized group of trained individuals perform core damage assessment. At a minimum, personnel responsible for core damage assessment receive classroom and hands-on training in the following areas:~~ ~~• Available Instrumentation and Equipment~~ ~~• Isotopic Assessment and Interpretation~~ ~~• Computerized Core Damage Assessment Methodology (CDAM) and/or proceduralized assessment methods.~~	changes being made in the Byron TS Administrative Controls LAR[4]
Part II.P.2 Authority for the Emergency Preparedness Effort	**2. Authority for the Emergency Preparedness Effort** The Site Vice President is responsible for the safe and reliable operation of the generating station. The issuance and control of this plan and the activities associated with emergency preparedness at Byron shall be the overall responsibility of the Vice President, Fleet Support. This individual is assigned the responsibility for overall implementation of the E-Plan and station Annex.	**2. Authority for the Emergency Preparedness Effort** The ~~Site Vice President~~ **Plant Manage**r is responsible for the safe and reliable operation of the ~~generating~~ station. The issuance and control of this plan and the activities associated with emergency preparedness at Byron shall be the overall responsibility of the Vice President, Fleet Support. This individual is assigned the responsibility for overall implementation of the E-Plan and station Annex.	The revision replaces the Station Vice President with the Plant Manager as having overall authority and directing the site organization. This change is in alignment with the site staffing changes being made in the Byron TS Administrative Controls LAR.[5]

[4] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)
[5] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)

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Part II.P.3 Responsibility for Development and Maintenance of the Plan	Program Administration <…> • Coordinate, document and review Performance Indicator data and reports. • Provide oversight of Drill and Exercise Performance (DEP) evaluations during License Operator Requalification (LOR) Training. • Coordinate and conduct EP Event reviews and reports. <…>	Program Administration <…> • Coordinate, document and review Performance Indicator data and reports. • Provide oversight of Drill and Exercise Performance (DEP) evaluations during ~~License~~ Operator ~~Requalification (LOR)~~ Training. • Coordinate and conduct EP Event reviews and reports. <…>	This revision changes the name of the operator training program. This change is in alignment with the site staffing changes being made in the Byron TS Administrative Controls LAR.[5]
Part II.P.4 E-Plan and Agreement Revisions	**4. E-Plan and Agreement Revisions** <…> The E-Plan and its Annex shall be revised as needed and the most current approved revisions shall remain in effect so long as they are certified as current. Revisions to the E-Plan are reviewed by the Station's Plant Operational Review Committee (PORC) prior to approval. Changes to the plan are made without NRC approval only if such changes do not result in a reduction in effectiveness of the plan per 10 CFR 50.54(q), and the plan as changed continues to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E. Proposed changes that reduce or have a potential to reduce the effectiveness of the approved plan are not implemented without prior approval by the NRC. <…>	**4. E-Plan and Agreement Revisions** <…> The E-Plan and its Annex shall be revised as needed and the most current approved revisions shall remain in effect so long as they are certified as current. Revisions to the E-Plan are reviewed by the Station~~'s Plant Operational~~ Review Committee (~~PO~~**S**RC~~)~~ prior to approval. Changes to the plan are made without NRC approval only if such changes do not result in a reduction in effectiveness of the plan per 10 CFR 50.54(q), and the plan as changed continues to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E. Proposed changes that reduce or have a potential to reduce the effectiveness of the approved plan are not implemented without prior approval by the NRC. <…>	Once the plant has permanently defueled and implemented the Defueled Quality Assurance Program the Plant Operational Review Committee is replaced with the Station Review Committee (SRC)
Part II.P.6 Supporting Emergency Response Plans	**6. Supporting Emergency Response Plans** <…> • INPO Emergency Resources Manual. <…>	**6. Supporting Emergency Response Plans** <…> • ~~INPO Emergency Resources Manual.~~ <…>	The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.

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Part II.P.9 Audit/Assessment of the Emergency Preparedness Program	**9. Audit/Assessment of the Emergency Preparedness Program** <…> Results of this audit are submitted for review to Corporate Management and the Station Vice President. The Emergency Preparedness Manager ensures that any findings that deal with offsite interfaces are reviewed with the appropriate agencies. Written notification will be provided to the state and counties of the performance of the audit and the availability of the audit records for review at Exelon facilities. Records of the audit are maintained for at least five years.	**9. Audit/Assessment of the Emergency Preparedness Program** <…> Results of this audit are submitted for review to Corporate Management and the ~~Station Vice President~~ **Plant Manager.** The Emergency Preparedness Manager ensures that any findings that deal with offsite interfaces are reviewed with the appropriate agencies. Written notification will be provided to the state and counties of the performance of the audit and the availability of the audit records for review at Exelon facilities. Records of the audit are maintained for at least five years.	The revision replaces the Station Vice President with the Plant Manager as having overall authority and directing the site organization. This change is in alignment with the site staffing changes being made in the Byron TS Administrative Controls LAR.[6]
Part III App 1 References	<…> 28. *Exelon Nuclear Quality Assurance Topical Report (QATR), NO-AA-10* 29. INPO Emergency Resources Manual 30.."Maintaining Emergency Preparedness Manual," dated December, 1996 INPO 96-009. 31. "Federal Bureau of Investigation and Nuclear Regulatory Commission Memorandum of Understanding for Cooperation Regarding Threat, Theft, or Sabotage in U.S. Nuclear Industry," Federal Register, Vol. 44, p. 75535, December 20, 1979. <…>	<…> 28. Exelon ~~Nuclear~~**Decommissioning** Quality Assurance **Program** ~~Topical Report~~ (~~QATR~~**DQAP**), NO-~~AA~~**DC**-10 29. **Deleted** ~~INPO Emergency Resources Manual~~ 30 **Deleted** ~~*"Maintaining Emergency Preparedness Manual," dated December, 1996 INPO 96-009.*~~ 31. "Federal Bureau of Investigation and Nuclear Regulatory Commission Memorandum of Understanding for Cooperation Regarding Threat, Theft, or Sabotage in U.S. Nuclear Industry," Federal Register, Vol. 44, p. 75535, December 20, 1979. <…>	Exelon has a previously NRC approved Decommissioning Quality Assurance Program (DQAP). [7]Byron will be added to the DQAP under 50.54(a) upon submittal of the certifications required by 10 CFR50.82(a). The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.

[6] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)

[7] Letter from U.S. Nuclear Regulatory Commission to Bryan C. Hanson (Exelon Generation Company, LLC), "Oyster Creek Nuclear Generating Station and Independent Spent Fuel Storage Installation - Review and Acceptance of Changes RE: Decommissioning Quality Assurance Program (EPID L-2017-LLQ-0003)," dated June 27, 2018 (ADAMS Accession No. ML18165A136)

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	39. Letter from William J. Dircks, Executive Director for Operations, NRC, to Dr. Donald F. Knuth, President KMC, Inc. dated October 26, 1981. 40. INPO Coordination agreement on emergency information among USCEA, EPRI, INPO, NUMARC and their member utilities, dated April (1988). 41. Babcock and Wilcox Company, Post Accident Sample Offsite Analysis Program (1982). <…>	39. Letter from William J. Dircks, Executive Director for Operations, NRC, to Dr. Donald F. Knuth, President KMC, Inc. dated October 26, 1981. 40. **Deleted** ~~INPO Coordination agreement on emergency information among USCEA, EPRI, INPO, NUMARC and their member utilities, dated April (1988).~~ 41. Babcock and Wilcox Company, Post Accident Sample Offsite Analysis Program (1982). <…>	
Part III App 3 List of Corporate Letters of Agreements	**Appendix 3: List of Corporate Letters of Agreements** <…> INPO (Letter on File) Emergency Event Support <…>	***Appendix 3: List of Corporate Letters of Agreements*** <…> ~~*INPO (Letter on File)*~~ ~~*Emergency Event Support*~~ <…>	The revision reflects deletion of INPO because INPO's oversight would not apply to a permanently shutdown facility.
Part III App 4 Glossary of Terms and Acronyms	**Appendix 4: Glossary of Terms and Acronyms** Accident Assessment Accident assessment consists of a variety of actions taken to determine the nature, effects and severity of an accident and includes evaluation of reactor operator status reports, damage assessment reports, meteorological observations, seismic observations, fire reports, radiological dose projections, in plant radiological monitoring, and environmental monitoring. <…> Emergency Operating Procedures (EOPs) EOPs are step by step procedures for direct actions taken by licensed reactor operators to mitigate and/or correct an off normal plant condition through the control of plant systems. <…> Emergency Response Data System (ERDS) ERDS is a continuous direct near real-time electronic data link between the licensee's onsite computer system and the	Appendix 4: Glossary of Terms and Acronyms Accident Assessment Accident assessment consists of a variety of actions taken to determine the nature, effects and severity of an accident and includes evaluation of ~~reactor operator status reports,~~ damage assessment reports, meteorological observations, seismic observations, fire reports, radiological dose projections, in plant radiological monitoring, and environmental monitoring. <…> Emergency Operating Procedures (EOPs) EOPs are step by step procedures for direct actions taken by ~~licensed reactor~~ **qualified** operators to mitigate and/or correct an off normal plant condition through the control of plant systems. <…> ~~Emergency Response Data System (ERDS) ERDS is a continuous direct near real-time electronic data link between the licensee's onsite computer system and the~~	These revisions modify terms related to reactor operator status reports, source term, Technical Support Center, and vital areas. The revisions also remove terms related to ERDS, fission product barrier, high radiation sampling and puff release. The permanent shutdown of the Byron reactors and their defueled status makes these terms unnecessary within the Emergency Plan.

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TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
	NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters. <…> Fission Product Barrier The fuel cladding, reactor coolant system boundary, or the containment boundary. <…> High Radiation Sampling System Post-accident sampling capability to obtain and perform radioisotopic and chemical analyses of reactor coolant and containment atmosphere samples. <…> Puff Release A controlled containment vent that will be terminated prior to exceeding 60 minutes in duration and is less than the limit as defined in the Station Annexes. <…> Source Term Radioisotope inventory of the reactor core, or amount of radioisotope released to the environment, often as a function of time. Technical Support Center (TSC) A center outside of the Control Room in which information is supplied on the status of the plant to those individuals who are knowledgeable or responsible for engineering and management support of reactor operations in the event of an emergency, and to those persons who are responsible for management of the on site emergency response. <…> Vital Areas Areas within the station security fence which contain vital equipment. Examples include Control Rooms, Containment/Reactor Buildings, Turbine Buildings and Electrical Equipment Rooms.	~~NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters.~~ <…> ~~Fission Product Barrier The fuel cladding, reactor coolant system boundary, or the containment boundary.~~ <…> ~~High Radiation Sampling System Post-accident sampling capability to obtain and perform radioisotopic and chemical analyses of reactor coolant and containment atmosphere samples.~~ <…> ~~Puff Release A controlled containment vent that will be terminated prior to exceeding 60 minutes in duration and is less than the limit as defined in the Station Annexes.~~ <…> Source Term Radioisotope inventory ~~of the reactor core,~~ or amount of radioisotope released to the environment, often as a function of time. Technical Support Center (TSC) A center outside of the Control Room in which information is supplied on the status of the plant to those individuals who are knowledgeable or responsible for engineering and management support of ~~reactor~~ **site** operations in the event of an emergency, and to those persons who are responsible for management of the on site emergency response. <…> Vital Areas Areas within the station security fence which contain vital equipment. Examples include Control Rooms, ~~Containment/~~Reactor Buildings, Turbine Buildings and Electrical Equipment Rooms.	

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
Part III Appendices ACRONYMS	ACRONYMS <…> CHRMS Containment High Range Monitoring System CHRRMS Containment High Range Radiation Monitoring System <…> INPO Institute of Nuclear Power Operations <…> LOCA Loss of Coolant Accident <…> PASS Post Accident Sampling System <…> QATR Quality Assurance Topical Report <…> STA Shift Technical Advisor	ACRONYMS <…> ~~CHRMS Containment High Range Monitoring System~~ ~~CHRRMS Containment High Range Radiation Monitoring System~~ <…> **DQAP Decommissioning Quality Assurance Program** <…> ~~INPO Institute of Nuclear Power Operations~~ <…> ~~LOCA Loss of Coolant Accident~~ <…> ~~PASS Post Accident Sampling System~~ <…> ~~QATR Quality Assurance Topical Report~~ <…> ~~STA Shift Technical Advisor~~	This revision removes acronyms related to Containment, INPO, loss of coolant accident, PASS and STA. This revision replaced the QATR with the DQAP. The permanent shutdown of the Byron reactors and defueled status makes these acronyms unnecessary within the Emergency Plan.

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

EP-BY-1000, Part II, Appendix 5, Table Byron B-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

The following tables identify the changes made to Table Byron B-1. The table format is revised to more clearly present the changes within the Table.

	Emergency Preparedness (EP) Functions	**On Shift**	**TSC / OSC**		**EOF – Alert or Greater Augment w/in 60 min.**
			Alert or Greater Augment w/in 60 min.	**Alert or Greater Augment w/in 90 min.**	
Current Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Radiation Protection • 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.	(2) Radiation Protection Personnel	*(3) Additional Radiation Protection Personnel [In addition to personnel on-shift] (OSC)*	*(3) Additional Radiation Protection Personnel [In addition to personnel on-shift and those responding within 60 min.] (OSC)*	*Not applicable*
Proposed Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Radiation Protection • 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.	(~~2~~ **1**) Radiation Protection Personnel	(~~3~~ **2**) Additional Radiation Protection Personnel [In addition to personnel on-shift] (OSC)	~~(3) Additional Radiation Protection Personnel [In addition to personnel on-shift and those responding within 60 min.] (OSC)~~ **As needed**	Not applicable

Reason for Change - Changes to Table B-1 reflect the changes to the Byron ERO discussed in this Attachment. Evaluation of this ERO position's responsibilities is performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned. This revision is further discussed in Attachment 1, Section 5.3.3, Evaluation of Proposed Changes. The reassignment of ERO

responsibilities will be further demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).

	Emergency Preparedness (EP) Functions	On Shift	TSC / OSC		EOF – Alert or Greater Augment w/in 60 min.
			Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Current Wording EP-BY-1000, Part III Appendix 5, Table 5-1	**Emergency Classifications** Evaluate plant conditions and recommend emergency classifications, until relieved.	Emergency Classification Advisor[1]	(1) Operations Manager (TSC)	Not applicable	Not applicable
Proposed Wording EP-BY-1000, Part III Appendix 5, Table 5-1	**Emergency Classifications** Evaluate plant conditions and recommend emergency classifications, until relieved.	~~Emergency Classification Advisor[1]~~ **Not applicable**	(1) Operations Manager (TSC)	Not applicable	Not applicable

Reason for Change - Changes to Table B-1 reflect the changes to the Byron ERO discussed in this Attachment. Evaluation of this ERO position's responsibilities is performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned. This revision is further discussed in Attachment 1, Section 5.3.6, Evaluation of Proposed Changes. The reassignment of ERO responsibilities will be further demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

	Emergency Preparedness (EP) Functions	On Shift	TSC / OSC		EOF – Alert or Greater Augment w/in 60 min.
			Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Current Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Engineering • Provide engineering coverage related to the specific discipline of the assigned engineer, until relieved.	*(1) Core/ Thermal Hydraulics Engineer - STA[1]* • *Evaluate reactor conditions*	*TSC Engineering Staff* • *(1) Electrical/ Instrumentation and Control (I&C): Provide engineering coverage for the ERO related to electrical or I&C equipment.* • *(1) Mechanical: Provide engineering coverage for the ERO related to mechanical equipment.* • *(1) Core/Thermal Hydraulics: Evaluate reactor conditions.*	*As Needed*	*Not Applicable*

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Proposed Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Engineering • Provide engineering coverage ~~related to the specific discipline of the assigned engineer,~~ until relieved.	~~(1) Core/ Thermal Hydraulics Engineer - STA~~[1] • ~~Evaluate reactor conditions~~ **Not applicable**	**(1) TSC Engineer: Provide engineering coverage for the ERO** **Additional staff as needed** ~~TSC Engineering Staff~~ ~~• (1) Electrical/ Instrumentation and Control (I&C): Provide engineering coverage for the ERO related to electrical or I&C equipment.~~ ~~• (1) Mechanical: Provide engineering coverage for the ERO related to mechanical equipment.~~ ~~• (1) Core/Thermal Hydraulics: Evaluate reactor conditions.~~	As needed	Not applicable

Reason for Change - The revision deletes the Core/ Thermal Hydraulics Engineer - STA position. The Core/ Thermal Hydraulics Engineer - STA function for a permanently shutdown reactor is no longer required. EP functional requirements for Technical Support will be performed by Shift Supervisor/ Certified Fuel Handler (CFH). Refer to Attachment 1, Section 5.3.7 for further discussion of the Core/ Thermal Hydraulics Engineer - STA. This change is in alignment with the site staffing changes being made in the Byron TS Administrative Controls LAR.[8]

Additionally, changes to Table 5-1 reflect the changes to the Byron Engineering positions. Evaluation of the Engineering ERO position's responsibilities is performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned. This revision is further discussed in Attachment 1, Section 5.3.7, Evaluation of Proposed Changes. The reassignment of ERO responsibilities will be further demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).

[8] Letter from Patrick R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Proposed Changed to Technical Specifications Section 1.1, 'Definitions,' and 5.0, 'Administrative Controls,' for Permanently Defueled Condition," dated September 24, 2020 (NRC Accession No. ML20269A401)

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

	Emergency Preparedness (EP) Functions	On Shift	TSC / OSC		EOF – Alert or Greater Augment w/in 60 min.
			Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Current Wording EP-DR-1000, Part III Appendix 5, Table 5-1	*Repair Team Activities*	Not Applicable	*Maintenance Personnel (OSC)* • *(1) Electrical Maintenance Technician: Provide electrical support for ECCS equipment, event mitigation, and equipment repair.* • *(1) Mechanical Maintenance Technician: Provide mechanical support for ECCS equipment, event mitigation, and equipment repair.*	**Maintenance Personnel (OSC)** • (1) I&C Technician: Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable. Additional I&C staff may be called out if needed. • Electrical Maintenance Technicians – As needed. • Mechanical Maintenance Technicians – As needed.	*Not applicable*

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

	Emergency Preparedness (EP) Functions	On Shift	TSC / OSC		EOF – Alert or Greater Augment w/in 60 min.
			Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Current Wording EP-DR-1000, Part III Appendix 5, Table 5-1	Repair Team Activities	Not Applicable	Maintenance Personnel (OSC) • (1) Electrical Maintenance Technician: Provide electrical support for ~~ECCS equipment,~~ event mitigation, and equipment repair. • (1) Mechanical Maintenance Technician: Provide mechanical support for ~~ECCS equipment,~~ event mitigation, and equipment repair.	**Maintenance Personnel (OSC)** • (1) I&C Technician: Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable. Additional I&C staff may be called out if needed. • Electrical Maintenance Technicians – As needed. • Mechanical Maintenance Technicians – As needed.	*Not applicable*

Reason for Change - Changes to Table B-1 reflect the changes to the Byron ERO discussed in this Attachment. The reference to ECCS equipment is removed since the equipment is no longer required to support a permanently shutdown reactor with all fuel moved to the Fuel Pool. The revision of ERO responsibilities will be further demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

	Emergency Preparedness (EP) Functions	On Shift	TSC / OSC		EOF – Alert or Greater Augment w/in 60 min.
			Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Current Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Supervision of Repair Team Activities	Not Applicable	(1) OSC Director • Supervise OSC activities as directed by Emergency Coordinator.	OSC Supervisors • Electrical Maintenance Supervisor /Lead: Supervise OSC activities related to electrical equipment. • Mechanical Maintenance Supervisor / Lead: Supervise OSC activities related to mechanical equipment. • I&C Supervisor / Lead: Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor. • (1) Radiation Protection Supervisor / Lead: Supervise OSC activities related to radiation protection.	*Not applicable*

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Proposed Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Supervision of Repair Team Activities	Not Applicable	(1) OSC Director • Supervise OSC activities as directed by Emergency Coordinator.	OSC Supervisor**(**s**)** • ~~Electrical Maintenance Supervisor /Lead: Supervise OSC activities related to electrical equipment.~~ • ~~Mechanical Maintenance Supervisor / Lead: Supervise OSC activities related to mechanical equipment.~~ • ~~I&C Supervisor / Lead: Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor.~~ **As needed** • (1) Radiation Protection Supervisor / Lead[1]: Supervise OSC activities related to radiation protection.	Not applicable

Reason for Change - Changes to Table B-1 reflect the changes to the Byron ERO discussed in this Attachment. The Electrical, Mechanical and I&C Supervisor/Lead positions have been deleted. Additionally, the RP Supervisor/Lead position has been identified as a collateral responsibility for a responding RP Tech. Evaluation of this ERO position's responsibilities is performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned. This revision is further discussed in Attachment 1, Section 5.3.10, Evaluation of Proposed Changes. The reassignment of ERO responsibilities will be further demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

	Emergency Preparedness (EP) Functions	On Shift	TSC / OSC		EOF – Alert or Greater Augment w/in 60 min.
			Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Current Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Field Monitoring Teams (FMTs)	Not Applicable	**Onsite FM Individual** • (1) Qualified individual to assess the protected area for radiation and contamination and provide input to the TSC RPM. Responsible for radiation protection coverage for the FMT as directed by TSC RPM or EOF RPM. . **Offsite FMT A** • (1) Qualified individual to assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC	**Offsite FMT B** ▪ Qualified individual to assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM. • (1) Driver to provide transportation.	Not applicable

			or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM. • (1) Driver to provide transportation.		
Proposed Wording EP-BY-1000, Part III Appendix 5, Table 5-1	Supervision of Repair Team Activities	Not Applicable	**Onsite FM Individual** • (1) ~~Qualified individual~~ **RP Personnel** to assess the protected area for radiation and contamination and provide input to the TSC RPM. Responsible for radiation protection coverage for the FMT as directed by TSC RPM or EOF RPM. **Offsite FMT A** • (1) Qualified individual to assess the area(s) outside the protected area for radiation and contamination, and for radioactive	**Offsite FMT B** ▪ Qualified individual to assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM. • (1) Driver to provide transportation.	Not applicable

			plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM. ▲ (1) Driver to provide transportation.		

Reason for Change - Changes to Table B-1 reflect the changes to the Byron ERO discussed in this Attachment. The On Site Field Monitoring Team Member has been revised from a Qualified Individual to one (1) RP Personnel. Evaluation of this ERO position's responsibilities is performed in Attachment 4, ERO Task Analysis, including an evaluation of which responsibilities can be deleted and which can be reassigned. This revision is further discussed in Attachment 1, Section 5.3.10, Evaluation of Proposed Changes. The reassignment of ERO responsibilities will be further demonstrated through the performance of drills utilizing the revised procedures and staffing (reference Attachment 5 Commitments).

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Summary of Changes to Byron Emergency Plan

EP-AA-1002 – Radiological Emergency Plan Annex for Byron Station

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
EP-AA-1002	**Note: This table provides a summary of changes to EP-AA-1002, Radiological Emergency Plan Annex for Byron Station.**		
EP-AA-1002 Annex	Besides the changes associated with the permanent shutdown evaluated below, there are multiple editorial changes that are proposed in this license amendment request, i.e., they do not change the intent of the document. They do not impact the ability to comply with Regulatory Guidance or level of commitments made in the Emergency Plan. These changes are marked with revision bars within the Emergency Plan (except changes to step numbers); however, they are not specifically evaluated in the change assessment, since they are editorial. These include: • Changes in step numbers as a result of information which has been relocated or deleted. • Page number changes within the Table of Contents • Correction of spelling errors • Changes in Revision numbering and Revision History		
EP-AA-1002 Annex Section 1.1; Facility Description	**1.1 Facility Description** The Byron Station, Units 1 and 2, are located in Northern Illinois, approximately 3.7 miles south southwest of the City of Byron in Ogle County. This site is situated near the center of the county in a predominantly agricultural area. At its closest approach, the Rock River is approximately 1.5 miles west of the western site boundary and 2.2 miles west southwest of the actual plant location. Byron Station occupies approximately 1288 acres of land. The station site is somewhat rectangular in shape, with the plant structures occupying the southeast portion of the site. Figure 1-1 shows the general location of Byron Station. More specific information on station siting may be found in the Updated Final Safety Analysis Report (UFSAR). The plant consists of two identical pressurized water reactor (PWR) nuclear steam supply systems (NSSS) and turbine generators furnished by Westinghouse Electric Corporation. Each nuclear steam supply system is designed for a power output of 3645 MWt. Cooling for the plant is provided by two natural draft cooling towers for nonessential service cooling water and by mechanical draft cooling towers for essential service cooling water.	**1.1 Facility Description** The Byron Station, Units 1 and 2, are located in Northern Illinois, approximately 3.7 miles south southwest of the City of Byron in Ogle County. This site is situated near the center of the county in a predominantly agricultural area. At its closest approach, the Rock River is approximately 1.5 miles west of the western site boundary and 2.2 miles west southwest of the actual plant location. Byron Station occupies approximately 1288 acres of land. The station site is somewhat rectangular in shape, with the plant structures occupying the southeast portion of the site. **The Units are permanently defueled.** Figure 1-1 shows the general location of Byron Station. More specific information on station siting may be found in the Updated Final Safety Analysis Report (UFSAR). The plant ~~consists~~ **consisted** of two identical pressurized water reactor (PWR) nuclear steam supply systems (NSSS) and turbine generators furnished by Westinghouse Electric Corporation. Each nuclear steam supply system ~~is~~ **was** designed for a power output of 3645 MWt. Cooling for the plant is provided by ~~two natural draft cooling towers for nonessential service cooling water and~~	This revision recognizes the permanently defueled condition for Byron.

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
		~~by~~ mechanical draft cooling towers for essential service cooling water.	
EP-AA-1002 Annex Section 4.2 Assessment Actions	**4.2 Assessment Actions** Throughout each emergency situation, continuing assessment will occur. Assessment actions at Byron Station may include an evaluation of plant conditions; in plant, onsite, and initial offsite radiological measurements; and initial estimates of offsite doses. Core damage information is used to refine dose assessments and confirm or extend initial protective action recommendations. Byron Station utilizes WCAP-14696-A, Revision 1, (1999) as the basis for the methodology for post-accident core damage assessment. This methodology utilizes real-time plant indications. In addition, Byron Station may use samples of plant fluids and atmospheres as inputs to the CDAM (Core Damage Assessment Methodology) program for core damage estimation.	**4.2 Assessment Actions** Throughout each emergency situation, continuing assessment will occur. Assessment actions at Byron Station may include an evaluation of plant conditions; in plant, onsite, and initial offsite radiological measurements; and initial estimates of offsite doses.~~ Core damage information is used to refine dose assessments and confirm or extend initial protective action recommendations. Byron Station utilizes WCAP-14696-A, Revision 1, (1999) as the basis for the methodology for post-accident core damage assessment. This methodology utilizes real-time plant indications. In addition, Byron Station may use samples of plant fluids and atmospheres as inputs to the CDAM (Core Damage Assessment Methodology) program for core damage estimation.~~	This revision deletes reference to Core Damage Assessment personnel and CDAM. The permanent shutdown of the Byron reactors and defueled status makes the reference to CDAM unnecessary within the Emergency Plan.
EP-AA-1002 Annex Section 5 5.2.2 Onsite Radiation Monitoring Equipment	5.2.2 Onsite Radiation Monitoring Equipment The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system; post accident sampling capability; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.	5.2.2 Onsite Radiation Monitoring Equipment The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system;~~ post accident sampling capability;~~ portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.	This revision deletes post accident sampling capability. The permanent shutdown of the Byron reactors and defueled status makes post accident sampling capability unnecessary within the Emergency Plan

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
EP-AA-1002 Annex Section 5 5.2.2.1 Radiation Monitoring System	5.2.2.1 Radiation Monitoring System Chapters 11 and 12 of the Byron UFSAR describe the radiation monitoring system (RMS) in detail. The installed RMS is designed to continuously monitor the containment atmosphere, plant effluents, and various inplant locations. <…>	5.2.2.1 Radiation Monitoring System Chapters 11 and 12 of the Byron UFSAR describe the radiation monitoring system (RMS) in detail. The installed RMS is designed to continuously monitor ~~the containment atmosphere,~~ plant effluents, and various inplant locations. <…>	This revision deletes continuous monitoring of the containment atmosphere. The permanent shutdown of the Byron reactors and defueled status makes continuous monitoring of the containment atmosphere unnecessary within the Emergency Plan
EP-AA-1002 Annex Section 5 5.2.3 Onsite Process Monitors	5.2.3 Onsite Process Monitors An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Byron UFSAR. The operability of the post-accident instrumentation ensures information is available on selected plant parameters to monitor and assess important variables following an accident. Instrumentation is available to monitor the parameters and ranges given in Technical Specifications. Byron Station Emergency Operating Procedures aid personnel in recognizing inadequate core cooling using applicable instrumentation.	5.2.3 Onsite Process Monitors An adequate monitoring capability exists to properly assess the plant status ~~for all modes of operation~~ and is described in the Byron UFSAR. The operability of the post-accident instrumentation ensures information is available on selected plant parameters to monitor and assess important variables following an accident. Instrumentation is available to monitor the parameters and ranges given in Technical Specifications. ~~Byron Station Emergency Operating Procedures aid personnel in recognizing inadequate core cooling using applicable instrumentation.~~	This revision removes modes of operation and reference to inadequate core cooling. The permanent shutdown of the Byron reactors and defueled status makes the reference to modes of operation and core cooling unnecessary within the Emergency Plan.
EP-AA-1002 Annex Section 5 5.2.2.4 High Range Containment Radiation Monitors	5.2.2.4 <u>High Range Containment Radiation Monitors</u> Two high range containment radiation monitors are installed for each operating reactor. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is 1 rad/hr to 10^7 rads/hr.	~~5.2.2.4~~ **Deleted** ~~High Range Containment Radiation Monitors~~ ~~Two high range containment radiation monitors are installed for each operating reactor. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is 1 rad/hr to 10^7 rads/hr.~~	This revision deletes high range containment radiation monitors. The permanent shutdown of the Byron reactors and defueled status makes the reference to high range containment radiation monitors unnecessary within the Emergency Plan

Attachment 2
TABULAR SUMMARY OF CHANGES TO BYRON EMERGENCY PLAN

Emergency Plan Section	Current Wording	Proposed Wording	Reason for Change
EP-AA-1002 Annex Section 5 5.3 Protective Facilities and Equipment	5.3 Protective Facilities and Equipment The principal onsite assembly areas for Byron Station are the Machine Shop on the 401 foot elevation of the Service Building and the Unit #1 Turbine Building track way. These areas are suitable because: 1. They are large open areas suitable for assembling a large number of people in a short time; 2. They can be easily exited if a site evacuation is deemed necessary following an assembly; and 3. They have a low probability of being affected by a serious accident involving the Reactor and its primary systems. <…>	5.3 Protective Facilities and Equipment The principal onsite assembly areas for Byron Station are the Machine Shop on the 401 foot elevation of the Service Building and the Unit #1 Turbine Building track way. These areas are suitable because: 1. They are large open areas suitable for assembling a large number of people in a short time; 2. They can be easily exited if a site evacuation is deemed necessary following an assembly; and 3. They have a low probability of being affected by a serious **radiological** accident~~ involving the Reactor and its primary systems~~. <…>	This revision deletes mention of the reactor and its primary systems and clarifies the serious accident pertains to a radiological accident. The permanent shutdown of the Byron reactors and defueled status makes the reference to the reactor and its primary systems unnecessary within the Emergency Plan.

Attachment 3

Byron Station

PROPOSED REVISION TO SITE EMERGENCY PLAN

Attachment 3

Byron Station

PROPOSED REVISION TO SITE EMERGENCY PLAN

Exhibit A
Byron Station Radiological Emergency Plan
(Procedure EP-BY-1000)
(Marked-Up Pages)

EXELON NUCLEAR

BYRON STATION
RADIOLOGICAL EMERGENCY PLAN

2) State Agencies

a) The State of Illinois: The State of Illinois has the statutory responsibility and authority for protecting the health and safety of the public in Illinois. The State of Illinois has developed an "Illinois Plan for Radiological Accidents" (IPRA). This plan was developed in accordance with the guidance suggested by NUREG-0396 and NUREG 0654/FEMA-REP-1, Rev. 1. The IPRA has received 44 CFR 350 unconditional approvals from FEMA for all Exelon Nuclear's generating stations in the state of Illinois. Basic descriptions for the Illinois state agencies responsible for actions in the event of a nuclear power station are as follows:

- Governor of the State of Illinois: The Governor of the State of Illinois has overall command authority for both the radiological and non-radiological aspects of a nuclear incident. The Governor shall make the final recommendation for protective actions and shall serve as the state's primary spokesperson.

- Illinois Emergency Management Agency (IEMA): IEMA coordinates the operational response and recovery functions of all State agencies. IEMA proposes Protective Action Recommendations (PARs) to the Governor. IEMA also coordinates the implementation of the Governor's PARs.

  IEMA has the responsibility to inform the State of Wisconsin Department of Emergency Government (WDEG) with respect to an emergency event at Byron Nuclear Power Station that impacts the 50-mile Ingestion Pathway Zone.

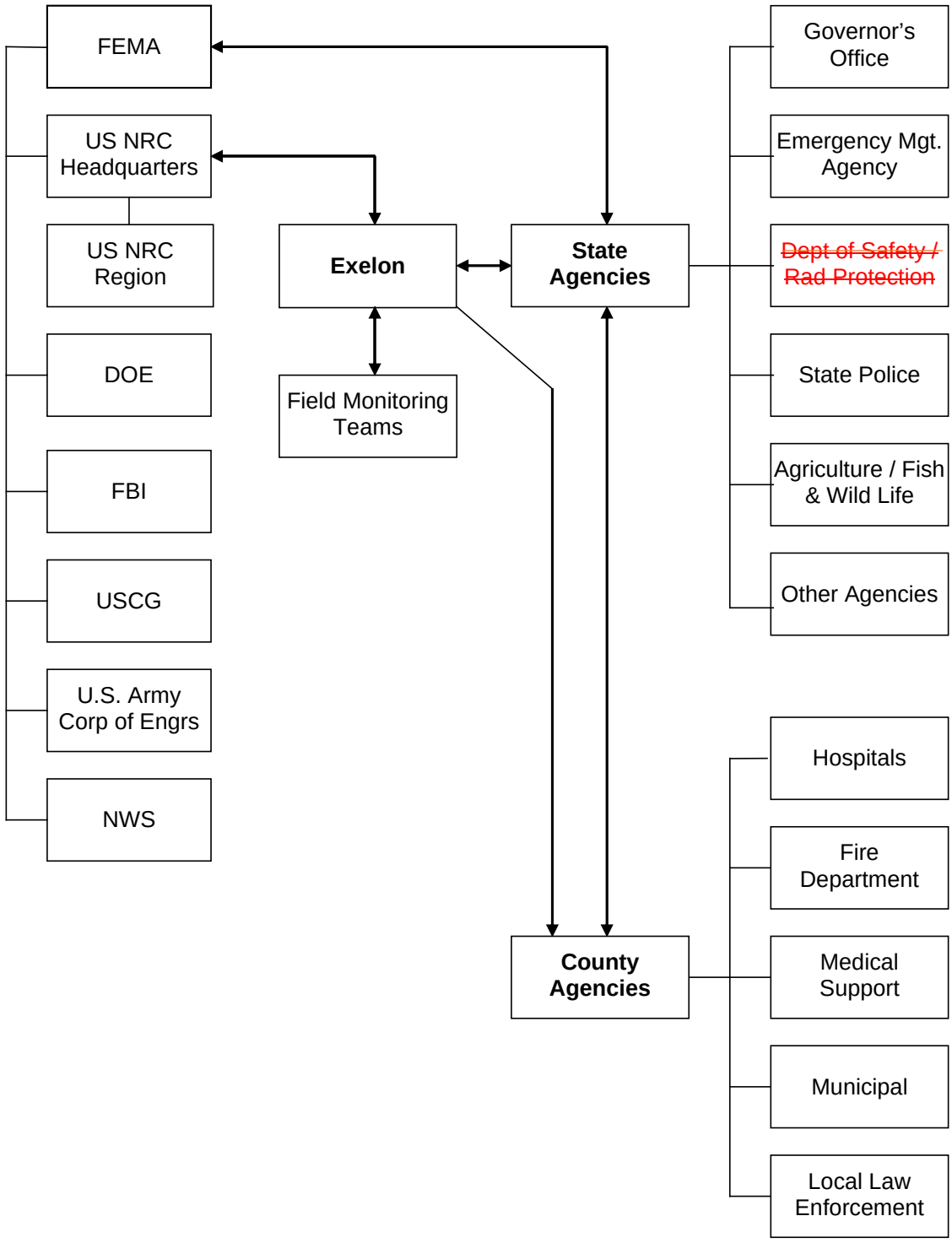
  IEMA ~~Technical~~ has both the command authority for radiological aspects of a nuclear incident and the responsibility for performing various radiological functions. These functions include milk, water and food control, radiation exposure control for state emergency workers, and confirmatory accident assessment. During an emergency situation, IEMA Technical shall make protective action recommendations to the Governor.

  For events that impact the 50-mile ingestion pathway for Byron Nuclear Power Station, IEMA Technical will coordinate technical information with the State of Wisconsin.

  The IEMA Technical response to a nuclear incident utilizes two functional subgroups. They are the Radiological Emergency Assessment Center (REAC) and the Radiological Assessment Field Team (RAFT).

  – Radiological Emergency Assessment Center (REAC): IEMA has established REAC in Springfield Illinois. REAC will serve as the command location for all (State related) radiological aspects of a nuclear incident. The Manager of the Office of Nuclear Facility Safety, or his/her designated alternate, is in command of REAC.

Figure A-2: Agency Response Organization Interrelationships



Section B: ~~Exelon~~ Byron Nuclear Emergency Response Organization

This section describes the ~~Exelon~~ Byron Nuclear Emergency Response Organization (ERO), its key positions and associated responsibilities. It outlines the staffing requirements which provide initial emergency response actions and provisions for timely augmentation of on-shift personnel when required. It also describes interfaces among Exelon Nuclear emergency response personnel and specifies the offsite support available to respond to Byron Station.

1. On-Shift Emergency Response Organization Assignments

The normal plant personnel complement is established with the Station ~~Vice President~~Plant Manager having overall authority for station operations. The Station ~~Vice President~~Plant Manager directs the site organization in the management of the various departments while the Shift Manager retains the responsibility for actual operation of plant systems. Emergency Preparedness must consider the capabilities of the normal plant organization, the Station and Corporate Emergency Response Organizations of Exelon Nuclear, and the non-Exelon Nuclear Emergency Response agencies. The initial phases of an emergency situation at a nuclear station will most likely involve a relatively small number of individuals. These individuals must be capable of (1) determining that an emergency exists; (2) providing initial classification and assessment; and (3) promptly notifying other groups and individuals in the emergency organization. The subsequent phases of the emergency situation may require an increasing augmentation of the emergency organization.

Byron Station has personnel on shift at all times that can provide an initial response to an emergency event. ERO staffing tables, contained within this Emergency Plan outline the plant on-shift emergency organization and its relation to the normal staff complement. Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing all response actions in an Unusual Event or the initial actions of higher classifications.

On Shift Personnel

Byron station has the capability at all times to perform detection, mitigation, classification, and notification functions required in the early phases of an emergency. Shift augmentation and further ERO involvement will be determined by the extent and magnitude of the event.

Shift Manager: While acting as Shift Emergency Director, will take immediate action during an emergency and will activate the Station ERO, as appropriate. In the Shift Manager's absence or incapacitation, the line of succession is defined by Byron procedures.

~~Shift Technical Advisor (STA): During normal plant operations, the Senior Reactor Operators report to the Shift Manager and directly supervise the licensed Reactor Operators and all activities in the Control Room. During an abnormal condition, the Shift Manager assumes direct supervision of personnel and all activities in the Control Room while a qualified individual steps back and assumes an overview role as an STA with the specific responsibility of monitoring the maintenance of core cooling and containment integrity. An individual assigned the duty as the STA shall be available to the Control Room at all times.~~

Radiation Protection: The Station Radiation Protection personnel are responsible for the handling and monitoring of radioactive materials. Included in this organization are Health Physicists, Radiation Protection Supervisors and Technicians.

Security: The Station Security personnel are responsible for the physical security of the site. Included in this organization are Security Supervisors and Security Guards.

2. Authority Over the Emergency Response Organization

The Emergency Director in Command and Control is the designated Exelon Nuclear individual who has overall authority and responsibility, management ability, and technical knowledge for coordinating all emergency response activities at the nuclear power station.

- Control Room: Shift Emergency Director (Shift Manager)
- TSC: Station Emergency Director
- EOF: Corporate Emergency Director

3. Criteria for Assuming Command and Control (Succession)

Emergency personnel assume responsibility for their positions upon receiving notification to activate. The responsibility for initial assessment of and response to an emergency rests with the Shift Manager. The Shift Manager is the Shift Emergency Director and has the Station and Corporate Emergency Director's responsibilities and authority until relieved. The Corporate Emergency Director, once having relieved the Shift Manager of the Emergency Director responsibilities, is responsible for continued assessment of the severity of the emergency and for the necessary functions as described in the E-Plan, the Station Annex, and the emergency implementing procedures.

- Rescue operations and First Aid
- Decontamination
- Security of plant and access control
- Repair and damage control
- Personnel protection including Assembly, Accountability and Evacuation
- Communications

All Station ERO personnel shall have the authority to perform assigned duties in a manner consistent with the objectives of this plan.

~~When plant conditions warrant entry into the Severe Accident Management Guidelines (SAMGs), On-shift staff or TSC Minimum staff ERO may assume the roles of Decision-Maker and Evaluators as directed by station procedures.~~

1) Shift Manager (Shift Emergency Director) Control Room

A Shift Manager is on duty 24 hours a day and is the Shift Emergency Director in a declared emergency until relieved of this function. While serving in this capacity the Shift Manager is responsible for:

- Activating the ERO (as deemed appropriate or as procedurally required).
- Performing those duties outlined in Section B.5.a.2 for the Station Emergency Director.

The on-duty Shift Manager directs the activities of the operating crew and is responsible for the safe operation of the plant in compliance with the station NRC operating license and the station operating procedures. The Shift Manager, after relinquishing Command and Control, functionally reports to the Operations Manager in the TSC.

The Shift Manager's responsibilities, when not in Command and Control, are described below:

- ~~The authority and responsibility to shutdown the reactor when determined that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection circuit set-points and automatic shutdown does not occur;~~
- ~~To ensure a review has been completed to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction;~~
- ~~The responsibility to be present at the plant and to provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction;~~

- Coordinate TSC efforts in determining the nature and extent of emergencies pertaining to equipment and plant facilities in support of Control Room actions.
- Initiate immediate corrective actions to limit or contain the emergency invoking the provisions of 10 CFR 50.54(x) if appropriate.
- Recommend equipment operations checks and miscellaneous actions to the Control Room in support of restoration and accident mitigation.
- Approve emergency special procedures, and implement as required under the provisions of 10 CFR 50.54(x).
- Assist in determining the priority assigned to OSC activities.
- Organize and direct medical response efforts for injured personnel.
- Ensure adequate staffing of the Control Room and TSC subordinates.
- Ensure the Shift Manager is informed of OSC staffing utilization and activities.
- Identify steps or procedures that the Operations staff should be utilizing to properly respond to the emergency condition.
- Assist the Station Emergency Director in evaluating changes in event classification.
- Supervise the activities of the ENS Communicator in the TSC.
- Act as the TSC liaison with the appropriate NRC Site Team Representative.

5) Technical Support Staff TSC

The TSC Technical Support Staff consists of the following minimum staff engineering position~~s~~:

- ~~Electrical Engineer~~
- ~~Mechanical Engineer~~
- ~~Core/Thermal Hydraulic Engineer - serves as Core Damage Assessment Methodology (CDAM) Evaluator, as applicable.~~
- TSC Engineer

In addition, station Engineering support will be augmented on an as needed basis to support accident assessment and mitigation activities.

- Maintain plant security and account for all personnel within the protected area.
- Assist the Station Emergency Director in evaluating changes in security related threats and event classifications.
- Identify any non-routine security procedures and/or contingencies that are in effect or that require a response.
- Expedite ingress and egress of emergency response personnel.
- Coordinate with the Radiation Protection Manager in controlling ingress and egress to and from the Protected Area if radiological concerns are present.
- Provide for access control to the Control Room, TSC and OSC, as appropriate.
- Expedite entry into the Protected Area, as necessary, for the NRC Site Team.
- Act as the TSC liaison with the appropriate NRC Site Team representative.
- Assist the Radiation Protection Manager in determining personnel evacuation routes as necessary.
- Coordinate the evacuation of station non-essential personnel with the appropriate Local Law Enforcement Agencies (LLEAs).

8) Operations Support Center Director OSC

The OSC Director reports to the Emergency Director and supervises the activities of OSC personnel. Responsibilities include:

- Assign tasks ~~to designated Leads~~ as available:
  - I&C Maintenance
  - Mechanical Maintenance
  - Electrical Maintenance
  - Radiation Protection
- Coordinate with Operations in the dispatch of Operations personnel to support Control Room and OSC Team activities.
- Notify the Control Room and TSC prior to dispatch of any OSC teams into the plant.

- Maintain OSC resources including personnel, material, and equipment.
- Maintain accountability for all individuals dispatched from the OSC.
- Conduct periodic briefings on the overall plant status, emergency response activities, and station priorities.
- Assemble and dispatch the Field Monitoring Teams as required.

9) OSC RP Lead~~s~~ OSC

~~OSC Leads report to the OSC Director and are assigned from the following station departments:~~

- ~~Mechanical Maintenance~~
- ~~Electrical Maintenance~~
- ~~Instrument and Control~~
- ~~Radiation Protection~~

The OSC RP Lead assigned ~~to an OSC team~~ is responsible at all times for the safety of team personnel and to keep the OSC Director apprised of team status. Specifically, the OSC RP Lead~~s~~ are responsible for the managing and supervising ~~OSC team~~RP personnel, including:

- Conduct of adequate pre-dispatch briefings.
- Ensuring adequate protective equipment and measures have been identified.
- Tracking of OSC team activities while dispatched.
- Debriefing of team personnel upon return to the OSC.

7. Exelon Corporate Emergency Response Organization

The Corporate ERO consists of the EOF Organization and the Emergency Public Information Organization. Personnel staffing these corporate organizations are covered in detail in Section B.5 of this plan.

The Corporate Emergency Response Organization is staffed by Exelon personnel, and operates out of the Emergency Operations Facility (EOF) and the Joint Information Center (JIC). The Corporate ERO is supported by News Media Spokespersons, environmental assessment staff and monitoring teams that provide long-term support to the affected station. Additionally, the Corporate ERO has long term liaison responsibilities with federal, state, and local authorities. These positions are further described in the EPIPs.

The Emergency News Center (ENC) function is responsible for the collection and analysis of event information and status, and development of Company news statements. This information is then communicated to the JIC Corporate Spokesperson. The ENC function may be located at either the EOF or the JIC.

The EOF is activated at an Alert. The EOF Organization is responsible for evaluating, coordinating and directing the overall company activities involved in the emergency response. Within the EOF, the Corporate Emergency Director shall assume Command and Control from the Shift Emergency Director when classification escalates to an Alert or higher, unless the EOF capabilities are limited such that the overall control and responsibility for PARs and offsite notifications cannot be assumed. The JIC is activated within 90 minutes of an Alert or higher. Some JIC functions may continue to be performed by the Exelon Communications organization until transferred to the JIC.

8. Industry/Private Support Organizations

Exelon Nuclear retains contractors to provide supporting services to nuclear generating stations. A contract/purchase order with a private contractor is acceptable in lieu of an agreement letter for the specified duration of the contract. Among services currently provided are the following:

a. Deleted~~Institute of Nuclear Power Operations (INPO): Experience has shown that a utility may need resources beyond in-house capabilities for the recovery from a nuclear plant emergency. One of the roles of the Institute of Nuclear Power Operations (INPO) is to assist affected utilities by quickly applying the resources of the nuclear industry to meet the needs of an emergency. INPO has an emergency response plan that enables it to provide the following emergency support functions:~~

- ~~Assistance to the affected utility in locating sources of emergency personnel, equipment and operational analysis.~~
- ~~INPO, Electric Power Research Institute (EPRI) and Nuclear Energy Institute (NEI) maintain a coordination agreement on emergency information with their member utilities.~~

- ~~INPO provides the "Nuclear Network", or its replacement, electronic communications system to its members, participants, NEI, and EPRI to coordinate the flow of media and technical information about the emergency.~~

- ~~Exelon Nuclear may obtain utility industry information and assistance from any party to this agreement through the coordination of INPO.~~

~~To support these functions, INPO maintains the following emergency support capabilities:~~

- ~~A dedicated emergency call number.~~

- ~~Designated INPO representative(s) who can be quickly dispatched to the utility emergency response organization to coordinate INPO support activities and information flow.~~

- ~~The 24-hour per day operation of an Emergency Response Center at INPO headquarters.~~

~~Exelon Nuclear will notify INPO (via the designated emergency call number) for all situations involving an Alert, Site Area Emergency, or General Emergency declaration per the Exelon Nuclear Reportability Manual.~~

~~INPO has coordinated the preparation of a Voluntary Assistance Agreement for Transportation Accidents. Exelon Nuclear has signed this agreement which establishes the rights and responsibilities of electric utilities in requesting or providing assistance for response to a nuclear materials Transportation Accident.~~

b. American Nuclear Insurers (ANI): In early 1982, ANI issued Bulletin #5B (1981) "Accident Notification Procedures for Liability Insurers" which provides revised criteria for the notification of the Pools in the event of a nuclear emergency at one of the liability insured nuclear power reactor sites. This revision brings the ANI/MAELU (Mutual Atomic Energy Liability Underwriters) notification criteria into alignment with the standard emergency classification system adopted by the nuclear industry. This document also identifies a suitable channel for follow-up communication by ANI after initial notification.

   - ANI/MAELU Emergency Assistance: In the event of an extraordinary nuclear occurrence (as defined in the Price-Anderson Law) ANI and MAELU (the insurance pools) have plans prepared to provide prompt emergency funding to affected members of the public.

   - ANI/MAELU Emergency Assistance (Claims Handling Procedures): The pools' emergency assistance arrangements contemplate the mobilization and dispatch of emergency claims teams to directly dispense emergency assistance funds to affected members of the public.

Figure B-1a: ~~Exelon~~ Byron Overall ERO Command Structure

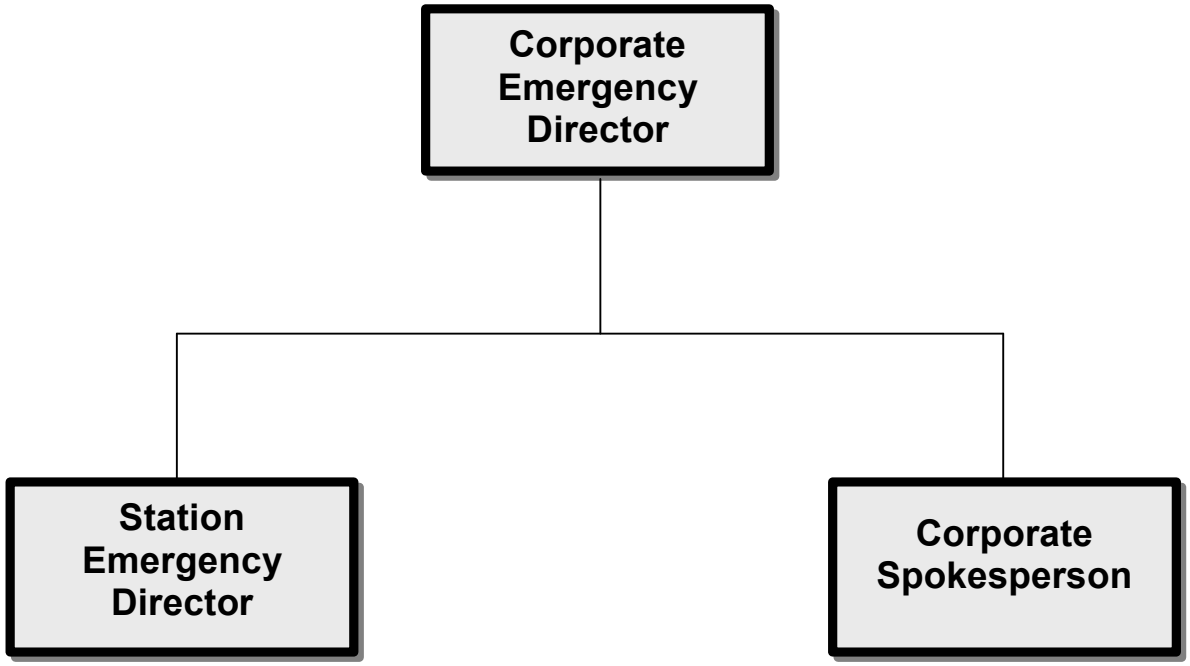
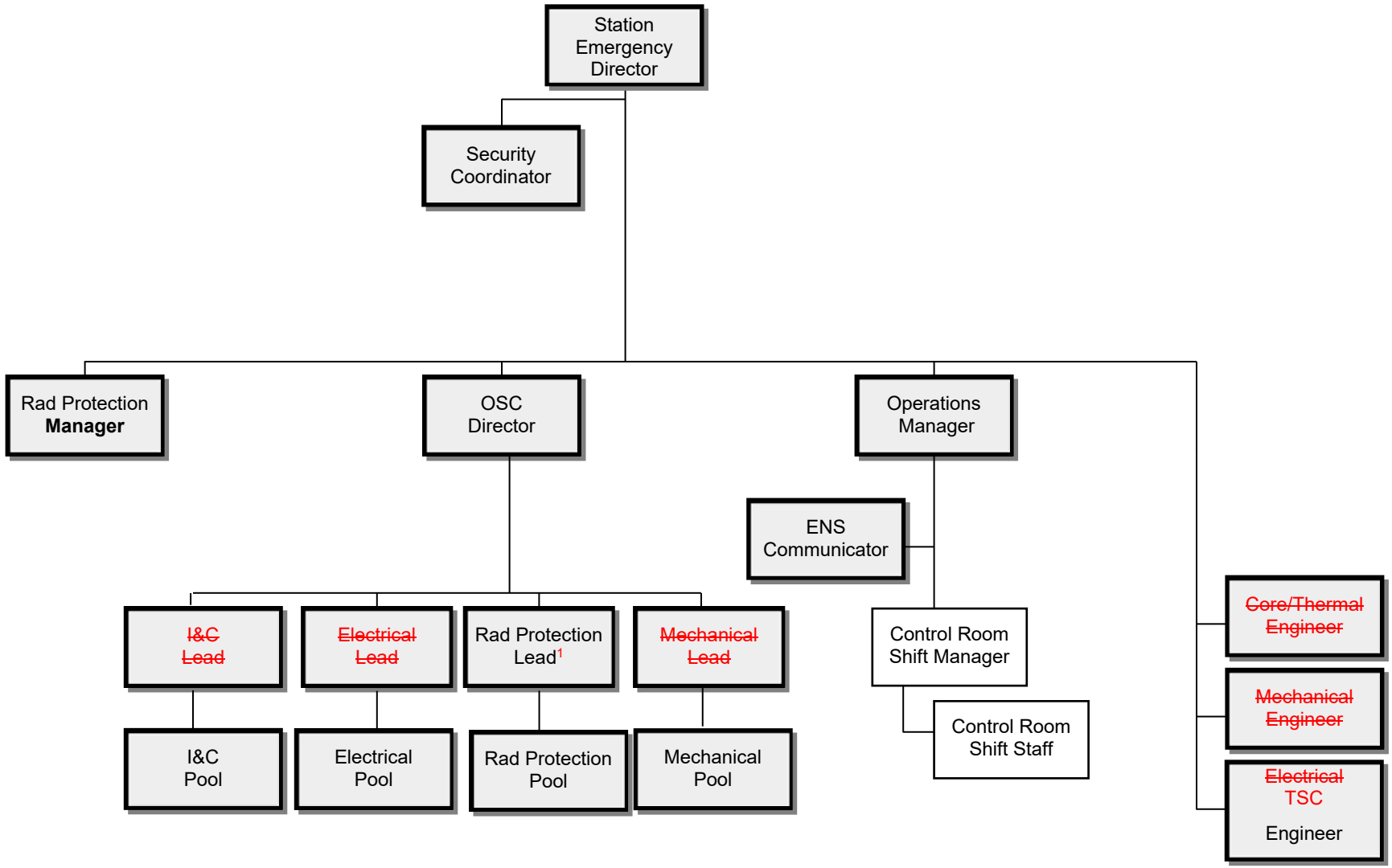


Figure B-1b: Emergency Onsite Organization



ERO response pool personnel do not include the on-shift complement.

[1] Rad Protection Lead responsibilities will be performed by a Rad Protection Pool responder as a collateral function.

- When the event is terminated, close-out is performed over communication links to offsite authorities participating in the response (i.e., NRC, state, county), followed by formal transmission of a state/local notification form within 24 hours.

b. Alert - Events are in process or have occurred which indicate an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of EPA Protective Action Guideline exposure levels.

The purpose of this classification is to ensure that emergency response personnel are readily available and to provide offsite authorities with current status information. An Alert will be classified as the initiating event or as escalation from an Unusual Event. In either case, the classification will most likely made by the Shift Manager (Shift Emergency Director) prior to the transfer of Command and Control.

Required actions at this classification include:

- Notifications to station management and the NDO.
- Notification, within 15 minutes, of the state and local communities. The EOF will assume state update responsibilities.
- Activation of the TSC, OSC, EOF, and the JIC organizations.
- Transfer of Command and Control.
- Notification of the NRC immediately after notification of the appropriate State and local agencies and not later than 60 minutes of classification.
- Notification of ~~INPO and~~ ANI.
- Assessment of the situation and response as necessary, which may include escalating to a higher classification if conditions warrant.
- On-site and off-site Field Monitoring Teams are sent to staging areas or dispatched to monitor for releases of radiation to the environment.
- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological and radiological data.
- When the event is terminated, notification is performed over communication links followed by an Initial Incident Report to offsite authorities participating in the response (i.e., NRC, state, county) within 8 hours.

c. Site Area Emergency - Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

The purpose of this classification, in addition to those of the Alert level, is to ensure that all emergency response centers are staffed and provisions are made for information updates to the public through offsite authorities and the news media. The classification will most likely be made by the Station Emergency Director following activation of the TSC.

Required actions at this classification, in addition to those listed under the Alert level, include:

- If not previously performed, Assembly/Accountability shall be performed and Site Evacuation of non-essential personnel shall be initiated.
- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological data and projected or actual doses for any releases that have occurred.

d. General Emergency - Event(s) are in process or have occurred which involve actual or imminent substantial ~~core~~ fuel degradation or melting ~~with potential for loss of containment integrity~~ or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

The purpose of this classification, in addition to those of the Site Area Emergency level, is to initiate predetermined protective actions for the public and provide continuous assessment of information from monitoring groups. The classification will most likely be made by the Station Emergency Director following activation of the TSC.

Required actions at this classification, in addition to those listed under the Alert and Site Area Emergency, include:

- A Protective Action Recommendation will be determined.
- Assessment of the situation and response as necessary.

e. Recovery: That period when the emergency phase is over and activities are being taken to return the situation to a normal state (acceptable condition). The plant is under control and no potential for further degradation to the plant or the environment is believed to exist.

   Recovery will be classified by the Station Emergency Director after obtaining authorization from the Corporate Emergency Director.

   Required actions at this classification include:

   - The affected state(s) and the NRC should be consulted prior to entry into Recovery.
   - Notifications will be made to station management, the NDO, state(s) and NRC.
   - A Recovery organization will be established to manage repairs to return the Unit to an acceptable condition, and support environmental monitoring activities as requested in coordination with Federal and state efforts.
   - ~~INPO and~~ ANI ~~are~~is notified of Recovery classification.

f. Classification Downgrading: Exelon Nuclear policy is that emergency classifications shall not be downgraded to a lower classification. Once declared, the event shall remain in effect until no Classification is warranted or until such time as conditions warrant classification to Recovery.

g. Guidance for Termination of an Emergency: The purpose of terminating an emergency is to provide an orderly turnover of plant control from the Emergency Response Organizations to the normal Exelon Nuclear plant organization. Termination of the emergency is authorized by the Emergency Director in Command and Control. The considerations provided in the Recovery/Termination Checklist in the emergency implementing procedures must be performed prior to exiting the emergency event. Consultation with governmental agencies and other parties should be conducted prior to termination of an event classified as Site Area or General Emergency. Notifications shall be transmitted to appropriate agencies to terminate an event.

h. Station Nuclear Security Plan: Byron has a Security Plan that complies with the requirements of 10 CFR 73. The interface between the E-Plan and the Security Plan is one of parallel operation. The plans are compatible. The E-Plan response measures, once initiated, are executed in parallel with measures taken in accordance with the Security Plan.

An emergency is classified after assessing abnormal plant conditions and comparing them to EAL Threshold Values for the appropriate Initiating Conditions. Classifications are based on the evaluation of each unit for multi-reactor sites. Matrix tables organized by recognition categories are used to facilitate the comparison. ~~The matrix tables are used when the unit is in the Technical Specification defined modes of Power Operations, Hot Standby, Hot Shutdown (for classifications purposes, startup evolutions are included in the Power Operations mode) and Cold Shutdown or Refueling (for classification purposes a defueled plant will be considered in the Refueling mode).~~

All recognition categories should be reviewed for applicability prior to classification. The initiating conditions are coded with a letter and/or number designator. All initiating conditions, which describe the severity of a common condition (series), have the same initial designator.

3. Timely Classification of Events

Classification of an emergency condition occurs within 15 minutes after the availability of indications from plant instrumentation, plant alarms, computer displays, or incoming verbal reports that an EAL has been exceeded and, is then promptly made upon identification of the appropriate EAL. The 15-minute period encompasses all assessment, classification, and declaration actions associated with making an emergency declaration from the first availability of a plant indication or receipt of a report up to and including the declaration of the emergency.

Validation or confirmation of plant indications or reports of the condition are to be accomplished within the 15-minute period as part of the assessment. Since this validation or confirmation is being performed to determine the validity of an alarm, indication, or report, the 15-minute period starts with the availability of the alarm, indication, or report to any qualified EAL assessor, and not the completion of the validation or confirmation, because the former is the time that the information was first available.

A qualified EAL assessor means any member of the plant staff who, by training and experience, is qualified to assess the indications or reports for validity and to compare the same to the EALs. A qualified EAL assessor may be, but need not be, a ~~licensed operator~~Certified Fuel Handler, Non Certified Operator or member of the ERO. Qualified EAL assessors may be in the MCR or in another facility where emergency declarations are performed. A qualified EAL assessor does not include personnel such as chemists, radiation protection technicians, craft personnel, security personnel, and others whose positions require they report, rather than assess, abnormal conditions to the MCR.

b. Offsite: Notifications are promptly made to offsite emergency response organizations as follows:

1) State/Local Agencies: A notification shall be made within fifteen (15) minutes of:

- The initial emergency classification.
- Classification escalation.
- The issuance of or change to a Protective Action Recommendation (PAR) for the general public.
- Changes in radiological release status, occurring outside of an event classification or PAR notification, based on an agreement with the state(s).

The emergency warning points are simultaneously notified using the Nuclear Accident Reporting System (NARS), or a commercial telephone line as backup.

A notification will also be initiated to cognizant state/local government agencies as soon as possible but within one hour of the termination of an event classification, or entry into Recovery Phase.

2) Nuclear Regulatory Commission (NRC): An event will be reported to the NRC Operations Center immediately after notification of the appropriate state or local agencies but not later than one (1) hour after the time of initial classification, escalation, termination or entry into the Recovery Phase. The NRC is notified by a dedicated telephone system called the Emergency Notification System (ENS). If the ENS is inoperative, the required notification is made via commercial telephone service, other dedicated telephone service, or any other method that shall ensure that a report is made as soon as practical. An NRC Event Notification Worksheet should be utilized to transmit initial information to the NRC. If a continuous communication is requested and established, a log is used in lieu of the ENS Worksheet.

Specific requirements for the notifications to the NRC for classified emergency events are detailed in 10 CFR 50.72 with guidance provided in the Exelon Reportability Manual.

~~The computerized data link to the NRC, referred to as the Emergency Response Data System (ERDS), continuously supplies specified plant data to the NRC.~~

Mobilization of federal, state, and county response organizations is performed in accordance with their applicable emergency plan and procedures. At a minimum, mobilization of federal response organizations and activation of state and county EOCs is expected to occur at the declaration of a Site Area Emergency.

The state and county authorities are responsible for the process of notification of the general public.

c. Support Organizations: When an emergency is initially classified, escalated or terminated, notifications are promptly made to the following support organizations:

- Medical, rescue, and fire fighting support services are notified for assistance as the situation dictates.
- ~~The Institute of Nuclear Power Operations (INPO) is notified at an Alert or higher classification with requests for assistance as necessary.~~
- The American Nuclear Insurers (ANI) are notified at an Alert or higher classification with requests for assistance as necessary.
- Vendor and contractor support services are notified for assistance as the situation dictates.

3. Initial Notification Messages

Exelon Nuclear, in conjunction with state and county authorities, has established the contents of the initial notification message form transmitted during a classified emergency. The contents of the form include, as a minimum:

- Designation ("This is a Drill" or "Actual Event").
- Identity of site.
- Event classification.
- EAL number (as agreed upon with state authorities).
- Non-technical event description (as agreed upon with state authorities).
- Date and time of declaration (or entry into Recovery or Termination).
- Whether a release is taking place (Note: “Release” means a radiological release attributable to the emergency event.)
- Wind direction and speed.
- Whether offsite protective measures may be necessary.
- Potentially affected Subareas (or Sectors as applicable) when a General Emergency is declared.

Notification approval, transmittal date and time, and offsite agencies contacted are recorded either on the notification form or in an event logbook.

The ANS is operated by local governmental agencies and maintained by Exelon Nuclear. To assure the ANS is maintained in an operational readiness posture, the local agencies have agreed to test the system (by sounding the sirens) on a periodic basis that meets or exceeds FEMA guidance and to report inoperable equipment to EP-designated maintenance personnel. The goal of the testing and maintenance program is to identify inoperable equipment in a timely manner and to restore equipment to a functional status commensurate with FEMA operability requirements as referenced in FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants" ~~Section E.6.2.1~~. In addition to this routine test and repair program, preventive maintenance of the ANS will be performed on an annual basis.

A more site-specific description of the various prompt public notification systems is presented in the Station Annex to the E-Plan. The activation of the ANS sirens, deployment of emergency service vehicles and operation of the Emergency Alerting System is discussed in detail in the state specific response plans.

7. Messages to the Public

The respective States have developed EAS messages for the public consistent with the classification scheme. These draft messages are included as part of the States' Emergency Plan and contain instructions with regard to specific protective actions to be taken by occupants and visitors of affected areas. Messages may include instructions such as: take shelter and go indoors, close windows and doors, turn off ventilation systems; directions given for evacuation; directions to stay tuned to specific stations for further information, ad-hoc respiratory protection, (e.g. handkerchief over mouth, etc.). Exelon will provide support for the content of these messages when requested. The States control the distribution of radioprotective drugs to the general public.

1) Nuclear Accident Reporting System (NARS): The NARS is a dedicated communications system that has been installed for the purpose of notifying state and local authorities of declared nuclear emergencies. This system links together the station Control Rooms, the EOF, TSCs and state and local authorities as appropriate. ~~The specific design, operation, and responsibility for maintenance of the NARS systems vary between Exelon Nuclear regions. Note that some stations refer to NARS as Radiological Emergency Communications System (RECS).~~

2) Operations Status Line: An independent interfacility telephone link called the Operations Status Line that enables communication between the Control Room, the TSC, the OSC, and the EOF to monitor the activities throughout the Emergency Response Facilities (see Figure F-2). The Operations Status line consists of a dedicated Private Branch Exchange (PBX) Telephone System or a Voice Over Internet Protocol (VoIP) system.

3) Director's Hotline: A dedicated telephone link called the Director's Hotline that enables direct Emergency Director communication between the Control Room, TSC, and the EOF (see Figure F-2). The Directors Hotline consists of a dedicated PBX or a VoIP system.

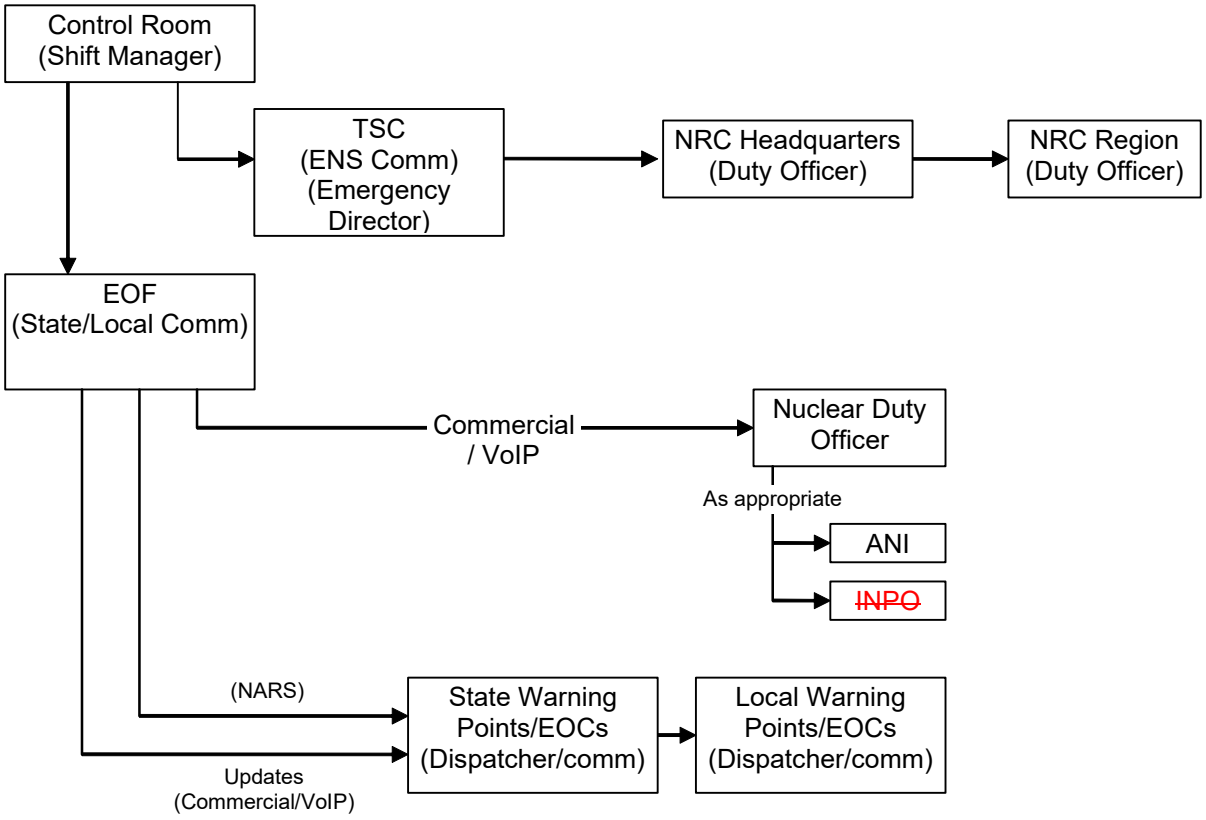
4) Local Commercial Telephone System: This system provides standard commercial telephone service through the public infrastructure, consisting of central offices and the wire line. The commercial vendor provides primary and secondary power for their lines at their central office.

~~5) Emergency Response Data System (ERDS): ERDS will continuously supply the NRC with selected plant data points on a near real time basis. The selected data points are transmitted automatically to the NRC at approximately 1-minute intervals.~~

~~6~~5) Field Monitoring Team (FMT) Communications: A separate communications system has been installed to allow coordinated environmental monitoring and assessment during an emergency. This system consists of the necessary hardware to allow communication via Satellite Phones between TSC, EOF, and mobile units in Exelon Nuclear vehicles. Commercial cell phones are available as back up to the primary field team communications system.

In addition, station communication links exist to ensure appropriate information transfer capabilities during an emergency. The station may also utilize its Public Address System, station radios and notification devices to augment its emergency communications.

Figure F-1: Exelon Notification Scheme (For Full Augmentation)



Section H: Emergency Facilities and Equipment

Onsite and offsite facilities are available for emergency assessment, communications, first aid and medical care, and damage control. Of particular importance are the Emergency Response Facilities (ERFs); the Control Room (CR), the Technical Support Center (TSC), the Operations Support Center (OSC), the Emergency Operations Facility (EOF), and the Joint Information Center (JIC).

This section describes the emergency facilities and equipment used by the Emergency Response Organization and outlines the requirements which aid in timely and accurate response actions. It also describes the surveillance programs used to monitor and ensure that these facilities and equipment are maintained in a high degree of constant readiness.

1. Control Room, Technical Support Center, and Operations Support Center

Byron has established a TSC and an on-site OSC, which are activated upon declaration of an Alert or higher classification. Until they become operational, required functions of these facilities are performed in the Control Room.

Under certain adverse conditions for Security-Based Events, personnel may be assembled in an “ERO Alternative Facility” prior to being dispatched to one of the facility ERFs.

a. Station Control Room: The Control Room is the centralized onsite location from which the Nuclear Station's ~~reactors and major~~ plant systems necessary to support the spent fuel pool are monitored~~operated~~. The Control Room is equipped with instrumentation to supply detailed information on the ~~reactors and major~~ plant systems. The Control Room is continuously staffed with qualified ~~licensed~~ operators. The Control Room is the first onsite facility to become involved with the response to emergency events. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency until such time that support centers can be activated. These activities shall include:

- ~~Reactor and p~~Plant control.
- Initial direction of all plant related operations.
- Accident recognition, classification, mitigation and initial corrective actions.
- Alerting of onsite personnel.
- Notification of appropriate individuals.
- Activation of emergency response facilities and ERO notification.
- Notification of offsite agencies.
- Continuous evaluation of the magnitude and potential consequences of an incident.

Personnel in the TSC shall be protected from radiological hazards, including direct radiation and airborne contaminants under accident conditions with similar radiological habitability as Control Room personnel. To ensure adequate radiological protection, permanent radiation monitoring systems have been installed in the TSC and/or periodic radiation surveys are conducted. These systems indicate radiation dose rates and airborne radioactivity inside the TSC while in use. In addition, protective breathing apparatus (full-face air purifying respirators) and KI are available for use as required.

The TSC has access to a complete set of as-built drawings and other records, including general arrangement diagrams, P&IDs, and the electrical schematics. The TSC has the capability to record and display vital plant data, in real time, to be used by knowledgeable individuals responsible for engineering and management support of ~~reactor~~ operations, and for implementation of emergency procedures.

c. Operations Support Center (OSC): Byron has established an OSC. The OSC is the onsite location to where station support personnel report during an emergency and from which they will be dispatched for assignments or duties in support of emergency operations. The OSC shall be activated whenever the TSC is activated, but need not remain activated at the Alert level if its use is judged unnecessary by the Station Emergency Director. At the Site Area and General Emergency levels, the OSC or an alternate OSC shall be activated at all times. The OSC is not activated for a HOSTILE ACTION when the Alternative Facility is implemented. Activation for other events is optional. Station disciplines reporting to the OSC include, but are not limited to:

- Operating personnel not assigned to the Control Room,
- Radiation Protection Personnel,
- Maintenance Personnel (mechanical, electrical and I&C).

Figure B-1b illustrates the staffing and organization for the OSC.

The OSC is equipped with communication links to the Control Room, the TSC and the EOF (see Section F). A limited inventory of supplies will be kept for the OSC. This inventory will include respirators, protective clothing, flashlights and portable survey instruments.

2. Emergency Operations Facility (EOF)

The EOF is the location where the Corporate Emergency Director will direct a staff in evaluating and coordinating the overall company activities involved with an emergency. Activation of the EOF is mandatory upon declaration of an Alert or higher classification. The EOF provides for:

- Management of overall emergency response.
- Coordination of radiological and environmental assessments.

It is the goal of the organization to be capable of activating the applicable Emergency Response Facility upon achieving minimum staffing. The facility can be declared activated when the following conditions are met:

a. Minimum staffing has been achieved.

b. The facility is functional.

The Director in charge may elect to activate their facility without meeting minimum staffing; if it has been determined that sufficient personnel are available to fully respond to the specific event (this would not constitute a successful minimum staff response).

5. Monitoring Equipment Onsite

Byron is equipped with instrumentation for seismic monitoring, radiation monitoring, fire protection and meteorological monitoring. Instrumentation for the detection or analysis of emergency conditions is maintained in accordance with station Technical Specifications, if applicable, or commitments made to the NRC. Descriptions of the equipment will appear in the Station Annex. This equipment includes but is not limited to the following:

a. Geophysical Monitors

1) Meteorological Instrumentation: A permanent meteorological monitoring station is located near each station for display and recording of wind speed, wind direction, and ambient and differential temperature for use in making offsite dose projections. Meteorological information is presented in the CR, TSC, and EOF by means of the plant computer system. This information is remotely interrogated using a computer or other data access terminal.

With regard to Exelon Nuclear's meteorological monitoring program, there has been a quality assurance program adopted from 10 CFR 50, Appendix B. However, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are not "safety related," not all aspects of 10 CFR 50, Appendix B, apply. Those aspects of quality assurance germane to supplying good meteorological information for a nuclear power station were adopted into the meteorological quality assurance program. The meteorological program is also subject to the requirements of the Decommissioning Quality Assurance Program~~QATR, Section 19, Augmented Quality~~.

The National Weather Service (NWS), or regional weather forecast providers, may be contacted during severe weather periods. These providers analyze national and local weather in order to provide localized weather forecasts for the system or for the station area as appropriate.

2) Seismic Monitoring: The seismic monitoring system measures and records the acceleration (earthquake ground motion) of the structure. Earthquakes produce low frequency accelerations which, when detected by the remote sensing devices, are permanently recorded as information which defines the response spectrum. The system remains in a standby condition until an earthquake causes the remote unit(s) to activate the recording circuits and tape transports. It also provides signals for immediate remote indication that specific preset response accelerations have been exceeded.

3) Hydrological Monitors: The design basis flood, probable maximum precipitation, and other improbable, conceivable extremes in hydrologic natural phenomena are well below any design limits for the station as detailed in the UFSAR.

b. Radiological Monitors and Sampling

1) The Radiation Monitoring System (RMS): In-plant radiological measurements provide information that may help determine the nature, extent and source of emergency conditions. The RMS is available to give early warning of a possible emergency and provides for a continuing evaluation of the situation in the Control Room. Radiation monitoring instruments are located at selected areas within the facility to detect, measure, and record radiation levels. In the event the radiation level should increase above a preset level, an alarm is initiated in the Control Room. Certain radiation monitoring instruments also alarm locally in selected areas of the facility. The RMS is divided into 3 subsystems:

a) Area Radiation Monitors (ARMs) are used for the direct measurement of in-plant exposure rates. The ARM readings allow in-plant exposure rate determinations to be made remotely without requiring local hand-held meter surveys. This information may be used, initially, to aid in the determination of plant area accessibility. In addition to permanent monitors, portable Continuous Air Monitors (CAMs) measure airborne particulate and airborne iodine activities at various locations within the operating areas.

b) Process Radiation Monitors (PRMs) are used for the measurement of radioactive noble gas, iodine, and particulate concentrations in plant effluent and other gaseous and fluid streams.

c) The accident, or high range, radiation monitoring system monitors radiation levels at various locations within the operating area. These are high range instruments used to track radiation levels under accident or post accident conditions. ~~These instruments include the Containment/Drywell Radiation Monitors.~~

The RMS provides the necessary activity or radiation levels required for determining source terms in dose projection procedures. Key RMS data is linked to the plant computer, which allows information to be passed to the TSC and EOF. The isotopic mix, including isotopes such as those in Table 3 of NUREG-0654, is based upon a default accident mix. Refer to the Byron UFSAR for further detail on the RMS capabilities and design.

2) Liquid and Gaseous Sampling Systems: The process sampling system consists of the normal sampling system and additional sampling panels located throughout the plant. Sampling systems are installed or can be modified to permit ~~reactor coolant and containment atmosphere~~ sampling even under severe accident conditions.

   The sampling systems use a number of manual sampling techniques to enable ~~reactor coolant and containment~~ sampling operations over a wide range of plant conditions. It is capable of providing information relative to post-accident plant conditions to allow operator actions to be taken to mitigate and control the course of an accident. Refer to the Byron UFSAR for further detail on sampling capabilities.

3) Portable Radiation Monitoring Equipment: Portable radiation survey instruments are available for a wide variety uses such as area, sample, and personnel surveys and continued accident assessment. Instruments are stored throughout the plant and in the emergency facilities.

c. Process Monitors: The Control Room and applicable redundant backup locations are equipped with extensive plant process monitors for use in both normal and emergency conditions. These indications include but are not limited to ~~reactor coolant system pressure and temperature, containment pressure and temperature,~~ liquid levels, flow rates, status or lineup of equipment components. This instrumentation provides the basis for initiation of corrective actions.

   1) Plant Monitoring/Information System: A plant monitoring/information system provides the data acquisition and database capability for performing plant monitoring and functions. The system is designed to scan, convert to engineering units, make reasonability and alarm limit checks, apply required transformations, store for recall and analysis, and display the reading of transformed data from plant instrumentation. The system scans flows, pressures, temperatures, fluid levels, radiation levels, equipment, and valve status at required frequencies. Scanned variables are quality tagged. The system provides for short and mid term storage of data for on-line retrieval and fast recall, and long term storage to appropriate media.

Section I: Accident Assessment

To effectively coordinate and direct all facets of the response to an emergency situation, diligent accident assessment efforts are required throughout the emergency. All four emergency classifications have similar assessment methods, however, each classification requires a greater magnitude of assessment effort dependent upon the plant symptoms and/or initiating event(s).

1. Plant Parameters and Corresponding Emergency Classification

Plant system and effluent parameter values are utilized in the determination of accident severity and subsequent emergency classification. Environmental and meteorological events are also determining factors in emergency classification. An emergency condition can be the result of just one parameter or condition change, or the combination of several. The specific symptoms, parameter values or events for each level of emergency classification are detailed in the emergency implementing procedures. Specific plant system and effluent parameters that characterize a classifiable event (EALs) are presented in Addendum 3 to each Station Annex.

In order to adequately assess the emergency condition, each emergency facility has the necessary equipment and instrumentation installed to make available essential plant information on a continuous basis. Evaluation of plant conditions is accomplished through the monitoring of plant parameters both from indication in the Control Room and within the plant. Some of the more important plant parameters to be monitored in the Control Room are assembled into a single display location, which is entitled the "Safety Parameter Display System" (SPDS). The SPDS monitors such parameters as: ~~reactor coolant system pressure, reactor or pressurizer water level, containment pressure, suppression pool water level and temperature, reactor power,~~ safety system status, ~~containment radiation level~~ and effluent monitor readings. The instrumentation and equipment capabilities available for each emergency facility are described in Section H.

2. Onsite Accident Assessment Capabilities

The resources available to provide initial and continuing information for accident assessment throughout the course of an event include plant parameter display systems, liquid and gaseous sampling system, Area and Process Radiation Monitoring Systems, and Accident Radiation Monitoring Systems ~~(which includes the high range containment radiation monitors)~~. Descriptions of these systems are given in Section H.5.b.

3. Source Term Determination

Source term (or ~~core~~ fuel damage) estimations serve several roles within the Exelon Emergency Preparedness Program. For planning purposes, fuel~~core~~ damage considerations are used as the bases for several of the Emergency Action Level (EAL) Initiating Conditions and as the threshold for the declaration of a General Emergency (the definition of a General Emergency specifies conditions which involve 'substantial' ~~core~~ fuel degradation or melting as one of the bases for classification).

From an implementation perspective, ~~core~~fuel damage estimations provide a means of realistically differentiating between the fuel ~~four core~~ states (no damage, clad failure, and fuel melt~~, and vessel melt-through~~) to:

- Evaluate the status of the fuel ~~barriers~~ clad and how their status relates to the risks and possible consequences of the accident.
- Provide input on ~~core~~ fuel configuration (coolable or uncoolable) for prioritization of mitigating activities.
- Determine the potential quality (type) and/or quantity (%) of source term available for release in support of projected offsite doses and protective action recommendations.
- Provide information that quantifies the severity of an accident in terms that can be readily understood and visualized.
- Support the determination of radiological protective actions that should be considered for long term recovery activities.

The assessment methodologies utilized by ~~Exelon~~ Byron are intended to provide a rapid best estimate of ~~core~~ fuel damage which, when evaluated together, help to develop an overall picture of the extent of ~~core~~ fuel damage. ~~The methods used to estimate the amount or type of core damage occurring under accident conditions includes the following:~~

- ~~Containment Radiation Monitors: An indirect method used to determine the amount of core damage. Applicable to Loss of Coolant Accident (LOCA) scenarios. Based upon an end-of-life source term and static nuclide ratio assumptions yielding a limited accuracy. Valid any time following an accident.~~
- ~~Core Temperatures: Methods such as Core Exit Thermocouple (CET), Peak Core Temperatures and Hot Leg Temperatures provide indirect methods used to indicate the type and/or amount of core damage. Applicable for all types of accidents. Valid any time following an accident.~~
- ~~Core Uncovery: Methods such as Core Uncovery Time, RVLIS Level and Source Range Monitor count rate provide indirect methods used to indicate the type of core damage (clad failure or fuel melt). Applicable for all types of accidents. Provides a relatively accurate estimate of the state of the core early in the event. Valid any time following an accident.~~
- ~~Containment Hydrogen Concentration: An indirect method used to establish the type of core damage. Applicable to LOCA type accidents where all the hydrogen generated by the metal-water reaction is released into containment. Valid any time following an accident.~~
- ~~Sample Analysis - Isotopic Ratio Comparison: A direct method used to establish the type of core damage. Compares expected isotopic ratios with a sample to determine a general core state. Applicable under all types of accidents. Valid any time following an accident.~~

- ~~Sample Analysis - Presence of Abnormal Isotopes: A direct method used to provide a go/no go indication of fuel melt by the presence of unusually high concentrations of the less volatile fission products. Applicable under all types of accidents. Valid any time following an accident.~~
- ~~Sample Analysis - Concentration Evaluation: A direct method that yields the most accurate numerical estimations of the amount of core damage. Applicable for all types of accidents. Requires the sampled system(s) be in a steady state that usually prevents its use until the plant is in a stable condition.~~

4. Effluent Monitor Data and Dose Projection

Dose assessment or projection represents the calculation of an accumulated dose at some time in the future if current or projected conditions continue. During an accident, the Plant Parameter Display System and personal computers will provide the ERO with the timely information required to make decisions. Radiological and meteorological instrumentation readings are used to project dose rates at predetermined distances from the station, and to determine the integrated dose received. Dose assessment methods used by Exelon personnel to project offsite doses include:

A. Monitored Release Points - This method utilizes the plant's effluent radiation monitors and system flow rates. Effluent release points are used to directly calculate a release rate. The point of the release determines the way the source term is affected and is adjusted by the dose assessment process.

~~B. Containment Leakage/Failure - This method uses a variety of containment failures or leak rates in conjunction with available source term estimations to develop a release rate to the environment. A direct vent of containment can be modeled as a failure to isolate.~~

~~C.~~B. Release Point Samples - This method uses a sample at the release point and an estimated flow rate to develop a release rate at the point of release.

~~D.~~C. Field Monitoring Team Data - This method uses a field survey or sample and the atmospheric model to back calculate a release rate and ratio concentrations of radioactive material at various points up and downwind of plume centerline.

The computer applications used to provide dose calculations are evaluated against the EPA-400 plume exposure Protective Action Guides (PAGs) applicable for the early phase of an accident. These evaluations place an emphasis on determining the necessity for offsite protective action recommendations. Dose assessment actions will be performed in the following sequence:

First: Onset of a release to 1 hour post-accident: Shift personnel will rely on a simplified computerized dose model to assist them in developing offsite dose projections using real time data from effluent monitors and site meteorology.

m. At a General Emergency classification, Exelon Nuclear will provide the state with recommendations for protective actions for the public. For incidents involving actual, potential, or imminent releases of radioactive material to the atmosphere, EPA 400-R-92-001, the NRC Response Technical Manual (RTM-96) and NUREG-0654, Supp. 3, Revision 1 are used as the basis for the general public PARs.

1) Plant Based PARs

Station specific PAR Flowcharts have been developed to aid Exelon Nuclear personnel providing PARs based on the above. Station specific PAR Flowcharts with Subarea or Sector tables are documented in the Exelon EP Implementing Procedures, including station-specific requirements regarding PAR determination. These flowcharts and tables provide technically based Protective Action Recommendations based on plant conditions ~~and core damage~~ indicators as applicable to the Exelon site and described within the implementing procedures. Possible plant based PARs issued by Exelon Nuclear, in support of NUREG-0654 Supp. 3, at a General Emergency could include as appropriate for the Station:

- Response to a Rapidly Progressing Severe Accident.
- Utilization of the staged evacuation concept as determined by station ETE's.
- Shelter of the general public in response to but not limited to~~; a controlled containment vent lasting less than 1 hour in duration less than PAGs,~~ impediments to evacuation~~,~~ or Hostile Action event.
- Evacuation of the general public.

In addition to the above actions to minimize or prevent potential exposure to radiation, a recommendation of "monitor and prepare" will be issued for the remainder of the EPZ.

2) Dose Based PARs

Evacuation is recommended if projected doses reach the minimum EPA PAGs (≥ 1 Rem EPA TEDE[1] or ≥ 5 Rem CDE Thyroid).

Many assumptions exist in dose assessment calculations, involving both source term and meteorological factors, which make computer predictions over long distances highly questionable. However, in the event dose assessment results indicate the need to recommend actions beyond the outer EPZ boundaries, which is past 10 miles, Field Monitoring Teams are dispatched to downwind areas to verify the calculated exposure rates prior to issuing PARs outside the EPZ. In the event dose assessment results indicate the need to recommend actions beyond the outer EPZ boundaries (past 10 miles):

[1] EPA TEDE is defined as the sum of the doses from external exposure and inhalation from the plume, and from 4 days of external exposure to deposited materials.

Establishment of Recovery can be conducted from any emergency classification level. However, it is possible that the lower classifications of Unusual Event and Alert will conclude with the event being terminated. There may be cases where certain EAL initiating conditions remain exceeded, but the station is under control and no further danger of degradation exists. In such a case, it may be appropriate to enter Recovery. Site Area and General Emergencies will require a Recovery Phase to be established prior to event termination. Exelon Nuclear may consult with/notify cognizant governmental agencies prior to declaring Recovery or event termination.

Termination/Recovery considerations are contained in the implementing procedures to provide guidance for evaluating the risk of entering Recovery without alleviating the intent of the Initiating Condition. The purpose of Recovery is to provide the necessary personnel to handle the long-term activities and to return the plant to an acceptable condition.

The following conditions are guidelines for the determination of establishing Recovery (this is not intended to be a complete list and additional criteria may apply, depending on the specifics of the event):

- The risk to the health and safety of the public has been mitigated.
- Plant parameters and equipment status have been established and controlled.
- In-plant radiation levels are stable or decreasing, and acceptable, given the plant conditions.
- The potential for uncontrolled releases of radioactive material to the environment has been eliminated.
- Environmental monitoring has been established.
- The radioactive plume has dissipated and plume tracking is no longer required (the only environmental assessment activities in progress are those necessary to assess the extent of deposition resulting from passage of the plume).
- Exelon Nuclear workers have been protected.
- Any security threat has been neutralized, and/or plant security is under the direction of Exelon Nuclear personnel.
- Adequate plant safety systems are operable.
- ~~The reactor is in a stable shutdown condition and long-term core cooling is available~~

- The fuel pool damage has been mitigated, or spent fuel damage has been contained and controlled.

~~Primary and/or secondary containment integrity has been established.~~

- Plant systems and equipment are restored and/or replaced such that plant conditions are stable highly unlikely to degrade further.

- Conditions that initiated the emergency have been contained, controlled, eliminated or stabilized such that the classification is no longer applicable.

- The operability and integrity of radioactive waste systems, decontamination facilities, power supplies, electrical equipment and of plant instrumentation including radiation monitoring equipment.

- Any fire, flood, earthquake or similar emergency condition or threat to security no longer exists.

- All required notifications have been made.

- Discussions have been held with federal, state and county agencies and agreement has been reached to terminate the emergency.

- At an Alert or higher classification, the ERO is in place and emergency facilities are activated.

- Any contaminated injured person has been treated and/or transported to a medical care facility.

- Offsite conditions do not unreasonably limit access of outside support to the station and qualified personnel and support services are available.

It is not necessary that all conditions listed above be met; however, all items must be considered prior to entering the recovery phase. For example, it is possible after a severe accident that some conditions remain that exceed an Emergency Action Level, but entry into the Recovery Phase is appropriate.

2. Recovery Organization

Once plant conditions have been stabilized and the Recovery Phase has been initiated, the Emergency Director may form a Recovery Organization for long-term operations. These types of alterations will be discussed with the NRC prior to implementation.

- For events of a minor nature, (i.e. for Unusual Event classifications) the normal on shift organization is normally adequate to perform necessary recovery actions.

- For events where damage to the plant has been significant, but no offsite releases have occurred and/or protective actions were not performed, (i.e. for Alert classifications) the station Emergency Response Organization, or portions thereof, should be adequate to perform the recovery tasks prior to returning to the normal station organization.

- For events involving major damage to systems ~~required to maintain safe shutdown of the plant and~~where offsite radioactive releases have occurred, (i.e. for Site Area Emergency or General Emergency classifications) the station recovery organization is put in place.

The specific members of the station recovery organization are selected based on the sequence of events that preceded the recovery activities as well as the requirements of the recovery phase. The basic framework of the station recovery organization is as follows:

a. The Recovery Director: The Corporate Emergency Director is initially designated as the Recovery Director. The Recovery Director is charged with the responsibility for directing the activities of the station recovery organization. These responsibilities include:

   - Ensuring that sufficient personnel, equipment, or other resources from Exelon and other organizations are available to support recovery.

   - Directing the development of a recovery plan and procedures.

   - Deactivating any of the plant Emergency Response Organization which was retained to aid in recovery, in the appropriate manner. Depending upon the type of accident and the onsite and offsite affects of the accident, portions of the ERO may remain in place after initiation of the recovery phase.

   - Coordinating the integration of available federal and state assistance into onsite recovery activities.

   - Coordinating the integration of Exelon support with federal, state and county authorities into required offsite recovery activities.

   - Approving information released by the public information organization which pertains to the emergency or the recovery phase of the accident.

   - Determining when the recovery phase is terminated.

b. The Recovery Plant Manager: The Station Manager or a designated alternate will become the Recovery Plant Manager. The Recovery Plant Manager reports to the Recovery Director and is responsible for:

   - Coordinating the development and implementation of the recovery plan and procedures.

c. Medical Emergency Drills: A medical emergency drill, involving a simulated contaminated individual, and containing provisions for participation by local support services organizations (i.e., ambulance and support hospital) are conducted annually . Local support service organizations, which support more than one station, shall only be required to participate once each calendar year. The offsite portions of the medical drill may be performed as part of the required biennial exercise.

d. Radiological Monitoring Drills: Plant environs and radiological monitoring drills (onsite and offsite) are conducted annually. These drills include collection and analysis of all sample media (such as, water, vegetation, soil, and air), and provisions for communications and record keeping.

e. Health Physics Drills: Health Physics Drills involving a response to, and analysis of, simulated airborne and liquid samples and direct radiation measurements within the plant are conducted semi-annually. At least annually, these drills shall include a demonstration of the sampling system capabilities~~, or the Core Damage Assessment Methodology (CDAM) objectives as applicable~~.

f. Augmentation Drills: Augmentation drills serve to demonstrate the capability of the process to augment the on-shift staff with a TSC, OSC and EOF in a short period after declaration of an emergency. These drills are conducted using the following methods:

- Quarterly, each station will initiate an unannounced off-hours ERO augmentation drill where no actual travel is required. Each region's Corporate ERO shall also perform an unannounced off-hours ERO augmentation drill that may be conducted independent of, or in conjunction with, a station drill.

- At least once per exercise cycle, an off-hours unannounced activation of the ERO Notification System with actual response to the emergency facilities is conducted by each station. Each region's Corporate ERO need only participate once per cycle.

g. Accountability Drills: Accountability drills are conducted annually. The drill includes identifying the locations of all individuals within the protected area.

3. Conduct of Drills and Exercises

Advance knowledge of the scenario will be kept to a minimum to allow "free-play" decision making and to ensure a realistic participation by those involved. Prior to the drill or exercise, a package will be distributed to the controllers and evaluators that will include the scenario, a list of performance objectives, and a description of the expected responses.

For each emergency preparedness exercise or drill conducted, a scenario package is developed that includes at least the following:

a. The basic objective(s) of the drill or exercise and the appropriate evaluation criteria.

Emergency response personnel in the following categories receive knowledge and/or performance based training initially and retraining thereafter once per calendar year not to exceed 18 months between training sessions.

a. Directors, Managers and Coordinators within the station and corporate ERO: Personnel identified by the Emergency Response Organization Telephone Directory as Directors, Managers and Coordinators for the station and corporate EROs receive training appropriate to their position in accordance with the approved ERO Training Program. These personnel receive specialized training in the areas of:

- Notifications
- Emergency Classifications
- Protective Action Recommendations
- Emergency Action Levels
- Emergency Exposure Control

Selected Directors, Managers, Coordinators and Shift Emergency Directors receive training in accordance with the approved ERO Training Program. Training in accident assessment sufficient to classify an event and to mitigate the consequences of an event are also covered.

b. Personnel Responsible for Accident Assessment:

The skills and knowledge required to perform plant stabilization and mitigation are a normal function of operations specific positions, as identified in Section B of this plan. ~~Power changes and planned and unplanned reactor shutdowns are handled on a normal operation basis.~~ Subsequent plant stabilization and restoration is pursued utilizing normal operating procedures. ~~Licensed~~ Qualified Operators receive routine ~~classroom and simulator~~ training to ensure proficiency in this area.

1) ~~Active Senior Licensed Control Room Personnel~~ Certified Fuel Handler shall have training conducted in accordance with the approved ERO Training Program such that proficiency is maintained on the topics listed below. These subjects shall be covered as a minimum on an annual basis.

- Event Classification.
- Protective Action Recommendations.
- Radioactive Release Rate Determination.
- Notification form completion and use of the Nuclear Accident Reporting System (NARS).
- Federal, state and local notification procedures as appropriate.

- Site specific procedures for activating the onsite and offsite ERO.

~~To remove peripheral duties from the Operations shift, the following group of positions responsible for accident assessment, corrective actions, protective actions, and related activities receive the training listed below:~~

~~2) Core Damage Assessment Personnel: During an emergency when core/cladding damage is suspected, a specialized group of trained individuals perform core damage assessment. At a minimum, personnel responsible for core damage assessment receive classroom and hands-on training in the following areas:~~

- ~~Available Instrumentation and Equipment~~
- ~~Isotopic Assessment and Interpretation~~
- ~~Computerized Core Damage Assessment Methodology (CDAM) and/or proceduralized assessment methods.~~

c. Radiological Monitoring Teams and Radiological Analysis Personnel

1) Offsite Radiological Monitoring: Offsite radiological monitoring is performed by trained individuals who provide samples and direct readings for dose assessment calculations and dose projection comparisons.

   Personnel identified as members of Field Monitoring Teams receive training in accordance with the approved training program. Field Monitoring Team members receive classroom and hands-on training in the following areas:

   - Equipment and Equipment Checks
   - Communications
   - Plume Tracking Techniques

2) Personnel Monitoring: Personnel monitoring is performed by trained individuals who monitor station personnel and their vehicles for contamination during an emergency. Personnel Monitoring Team members receive classroom and hands-on training in the following areas:

   - Personnel Monitoring Equipment and Techniques
   - Decontamination Techniques for Personnel
   - Decontamination Techniques for Vehicles

Section P: Responsibility for the Maintenance of the Planning Effort

This section describes the responsibilities for development, review and distribution of the E-Plan and actions that must be performed to maintain the emergency preparedness program. It also outlines the criteria for insuring that personnel who perform the planning are properly trained.

1. Emergency Preparedness Staff Training

The Emergency Preparedness staff is involved in maintaining an adequate knowledge of state of the art planning techniques and the latest applications of emergency equipment and supplies. At least once each calendar year each member of the Emergency Preparedness staff is involved in one of the following activities:

- Training courses specific or related to emergency preparedness.
- Observation of or participation in drills and/or exercises at other stations.
- Participation in industry review and evaluation programs.
- Participation in regional or national emergency preparedness seminars, committees, workshops or forums.
- Specific training courses in related areas, such as systems, equipment, operations, radiological protection, or Problem Identification & Resolution (PI&R).

2. Authority for the Emergency Preparedness Effort

The ~~Site Vice President~~Plant Manager is responsible for the safe and reliable operation of the ~~generating~~ station. The issuance and control of this plan and the activities associated with emergency preparedness at Byron shall be the overall responsibility of the Vice President, Fleet Support. This individual is assigned the responsibility for overall implementation of the E-Plan and station Annex.

3. Responsibility for Development and Maintenance of the Plan

Each regional Emergency Preparedness Manager is responsible for the overall radiological emergency preparedness program associated with the operation of the nuclear power stations within their respective region and to administer the program to ensure availability of resources in the event of an emergency. The regional Emergency Preparedness Managers report to an EP Director who in turn reports to the Vice President, Fleet Support.

The Emergency Preparedness Managers are assisted by regional corporate and Station Emergency Preparedness staff. Specific responsibilities include the following:

Program Administration

- Develop and maintain the E-Plan, Station Annex, implementing procedures and administrative documents.
- Develop and maintain 50.54(q) evaluations for changes to EP documents.
- Coordinate and maintain the EP Activities Schedule.
- Develop and maintain working relationships and coordinate meetings with Federal, state and local agencies.
- Ensure integration of plans between Exelon and offsite agencies.
- Provide an opportunity to discuss Emergency Action Levels and the availability of Nuclear Oversight audit results relating to interface with governmental agencies.
- Coordinate, negotiate and maintain agreements and contracts with offsite agencies and support organizations.
- Obtain Letters of Agreement with medical facilities, and medical consultants specifically skilled in the medical aspects of radiation accidents and other medical consultants as might be necessary for the case of a person involved in a radiation incident.
- Coordinate the development and annual distribution of the station's public information publication.
- Coordinate and administer the Self Evaluation Program to monitor and evaluate the adequacy of the Emergency Preparedness Program.
- Coordinate and support EP Self-Assessments, Audits and Inspections.
- Ensure the documentation and resolution of adverse conditions in the emergency preparedness program discovered through drills, audits, etc. in accordance with the Exelon Nuclear Corrective Action Program.
- Coordinate and develop Operational Experience responses.
- Coordinate, document and review Performance Indicator data and reports.
- Provide oversight of Drill and Exercise Performance (DEP) evaluations during ~~License~~ Operator ~~Requalification (LOR)~~ Training.
- Coordinate and conduct EP Event reviews and reports.

The E-Plan and its Annex shall be revised as needed and the most current approved revisions shall remain in effect so long as they are certified as current. Revisions to the E-Plan are reviewed by the Station~~'s Plant Operational~~ Review Committee (~~PORC~~SRC) prior to approval. Changes to the plan are made without NRC approval only if such changes do not result in a reduction in effectiveness of the plan per 10 CFR 50.54(q), and the plan as changed continues to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E. Proposed changes that reduce or have a potential to reduce the effectiveness of the approved plan are not implemented without prior approval by the NRC.

- Proposed revisions to the E-Plan and Station Annex shall be completed in accordance with the Exelon Nuclear review and approval processes.

- E-Plan and Station Annex changes shall be categorized as (1) minor/ administrative or (2) significant programmatic changes. Minor/administrative changes shall be implemented within 30 days of approval. Significant programmatic changes shall be implemented as soon as practical and within 60 days of final approval .

- After review and approval, the E-Plan and Station Annex shall be:

  a) Reviewed by the applicable Emergency Preparedness Manager(s) and EP Director, or designee(s), and

  b) Approved for use by the Vice President, Fleet Support or designee.

- The Implementing Procedures shall be developed and revised concurrent with the E-Plan and Annex, and reviewed every two years.

Annually, each Letter of Agreement is reviewed and certified current in order to assure the availability of assistance from each supporting organization not already a party to the individual State Plan for Radiological Accidents.

5. E-Plan Distribution

E-Plan manuals, Station Annex and implementing procedures are distributed on a controlled basis to the Emergency Response Facilities. All controlled documents holders are issued revision changes upon approval. Selected Federal, state, and local agencies, and other appropriate locations requiring them are also issued copies. Procedures are in place that control the revision of the E-Plan and require the use of revision bars and individual page identifications (i.e. section of plan, revision number, etc.).

6. Supporting Emergency Response Plans

Other plans that support this E-Plan are:

- NUREG-1471, US Nuclear Regulatory Commission, "Concept of Operations: NRC Incident Response"

- National Response Framework (NRF), Nuclear/Radiological Incident Annex.
- Illinois Plan for Radiological Accidents (IPRA).
- State of Wisconsin Peacetime Radiological Emergency Response Plan.
- Department of Energy, Region 5, “Radiological Assistance Plan"
- ~~INPO Emergency Resources Manual.~~
- Nuclear Station Security Plans - Note: The Station Security Plan contains industrial security information that must be withheld from public disclosure under provisions of 10 CFR 2.790(d).

7. Implementing and Supporting Procedures

Appendix 2 of this plan contains a listing, by number and title, of those procedures that implement this plan during an emergency. Additionally, administrative procedures that outline the steps taken to maintain the Exelon Emergency Preparedness Program have been developed and are listed in Appendix 2.

8. Cross Reference to Planning Criteria

The Plan is formatted in the same manner as NUREG-0654, FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants." The use of this format lends itself to uncomplicated comparison of the criteria set forth in NUREG-0654, FEMA-REP-1.

9. Audit/Assessment of the Emergency Preparedness Program

To meet the requirements of 10 CFR 50.54(t), Exelon Nuclear Oversight shall coordinate an independent review the Emergency Preparedness Program to examine conformance with 10 CFR 50.47, 10 CFR 50.54, and 10 CFR 50 Appendix E. Included in the audit/assessment are the following:

- The E-Plan and associated implementing procedures.
- The Emergency Preparedness Training Program including drills and exercises.
- The readiness of the station Emergency Response Organization to perform its function.
- The readiness of facilities and equipment to perform as outlined in the plan and procedures.
- The interfaces between Exelon, the state, and county governmental agencies pertaining to the overall Emergency Preparedness Program.

Results of this audit are submitted for review to Corporate Management and the ~~Station Vice President~~Plant Manager. The Emergency Preparedness Manager ensures that any findings that deal with offsite interfaces are reviewed with the appropriate agencies. Written notification will be provided to the state and counties of the performance of the audit and the availability of the audit records for review at Exelon facilities. Records of the audit are maintained for at least five years.

10. Maintenance of Emergency Organization Telephone Directory

Names and phone numbers of the Emergency Response Organization and support personnel shall be reviewed and updated at least quarterly.

18. NUREG-0737, Clarification of TMI Action Plan Requirements, dated October 1980.

19. NUREG-0737, Supplement 1, Requirements for Emergency Response Capability, December 1982.

20. NUREG 0728 - "Report to Congress: NRC Incident Response Plan."

21. US NRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," revision 4, July, 2003.

22. U.S. NRC Response Technical Manual (RTM-96)

23. NEI 99-01, Methodology for Development of Emergency Action Levels.

24. EPA 400-R-92-001, October 1991, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents."

25. FEMA-REP-10, Guide for Evaluation of Alert and Notification Systems for Nuclear Power Plants

26. FEMA-REP-14, Exercise Evaluation Methodology

27. FEMA-Guidance Memorandum, MS-1 "Medical Services"

28. Exelon ~~Nuclear~~ Decommissioning Quality Assurance Program ~~Topical Report~~ (~~QATR~~DQAP), NO-DC~~AA~~-10

29. Deleted ~~INPO Emergency Resources Manual~~

30. Deleted ~~"Maintaining Emergency Preparedness Manual," dated December, 1996 INPO 96-009.~~

31. "Federal Bureau of Investigation and Nuclear Regulatory Commission Memorandum of Understanding for Cooperation Regarding Threat, Theft, or Sabotage in U.S. Nuclear Industry," Federal Register, Vol. 44, p. 75535, December 20, 1979.

32. Illinois Department of Nuclear Safety, Title 32, Chapter II, Subchapter b, Part 340, "Standards for Protection Against Radiation."

33. ComEd April l983 response to NUREG 0737 Supplement #1 or latest submitted schedule of planned operational dates.

34. "Voluntary Assistance Agreement By and Among Electric Utilities involved in Transportation of Nuclear Materials," dated November 1, 1980.

35. Comprehensive Environmental Response, Compensation and Liability Act of 1980.

36. Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendation for State and Local Agencies, Volume 47, No. 205, October 22, 1982.

37. American Nuclear Insurers Bulletin #5B (1981), "Accident Notification Procedures for Liability Insureds".

38. "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency: Final Recommendations on Use," Federal Register Vol. 47, No. 125, June 29, 1982.

39. Letter from William J. Dircks, Executive Director for Operations, NRC, to Dr. Donald F. Knuth, President KMC, Inc. dated October 26, 1981.

40. Deleted ~~INPO Coordination agreement on emergency information among USCEA, EPRI, INPO, NUMARC and their member utilities, dated April (1988).~~

41. Babcock and Wilcox Company, Post Accident Sample Offsite Analysis Program (1982).

42. ANI/MAELU Engineering Inspection Criteria For Nuclear Liability Insurance, Section 6.0, Rev. 1, "Emergency Planning."

43. NRC RIS 2006-12, Endorsement of Nuclear Energy Institute Guidance “Enhancement to Emergency Preparedness Programs for Hostile Action.”

44. NRC Bulletin 2005-02, “Emergency Preparedness and Response Actions for Security-Based Events.”

45. NRC Information Notice 2009-01, National Response Framework

Appendix 3: List of Corporate Letters of Agreements

Organization/Agreement Type

Department Of Energy (DOE) Radiation Emergency
Assistance Center/Training Site, REAC/TS (Letter on File)
Medical Consultant

Environmental, Inc. (P.O.)
Radiological Environmental Monitoring

Landauer, Inc. (P.O.)
Emergency Dosimetry

~~INPO (Letter on File)~~
~~Emergency Event Support~~

Murray & Trettel, Inc. (P.O.)
Meteorological Support

Amita Health St. Joseph Hospital (Letter on File)
Back-up Emergency Medical Facility

Teledyne Brown Engineering (P.O.)
Bioassay Analysis/Radiochemical Analysis

Westinghouse Electric Company, PWRs (Letter on File)
PWR Emergency Support

J.D Ingenuities (P.O.)
Emergency Met Tower

National Foam, Inc.
Fire Foam Supply

Appendix 4: Glossary of Terms and Acronyms

Accident Assessment	Accident assessment consists of a variety of actions taken to determine the nature, effects and severity of an accident and includes evaluation of ~~reactor operator status reports,~~ damage assessment reports, meteorological observations, seismic observations, fire reports, radiological dose projections, in plant radiological monitoring, and environmental monitoring.
Activation	(1) "ERO Activation" is the process of initiating actions to notify and mobilize Emergency Response Organization (ERO) personnel following an event classification under the emergency plan. (2) "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).
Annual	Frequency of occurrence equal to once per calendar year, January 1 to December 31.
Assembly/Accountability	A procedural or discretionary protective action taken for all persons within the security "Protected Area", which involves the gathering of personnel into pre-designated areas, and the subsequent verification that the location of these personnel is known.
Assessment Actions	Those actions taken during or after an emergency to obtain and process information that is necessary to make decisions to implement specific emergency measures.

Drill	A supervised instruction period aimed at testing, developing and maintaining skills in a particular operation.
Early Phase	The period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must be based primarily on predictions of radiological conditions in the environment. This phase may last from hours to days. For the purposes of dose projections it is assumed to last four days.
Emergency Action Levels (EALs)	A pre-determined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.
Emergency Alert System (EAS)	A network of broadcast stations and interconnecting facilities which have been authorized by the Federal Communications Commission to operate in a controlled manner during a war, state of public peril or disaster, or other national or local emergency. In the event of a nuclear reactor accident, instructions/notifications to the public on conditions or protective actions would be broadcast by state or local government authorities on the EAS.
Emergency Director	Individual in Command and Control. One of the following: the Shift Emergency Director (Control Room), Station Emergency Director (TSC) or the Corporate Emergency Director (EOF).
Emergency Notification System (ENS)	The NRC Emergency Notification System hot line is a dedicated telephone system that connects the plant with NRC headquarters in White Flint, Maryland. It is directly used for reporting emergency conditions to NRC personnel.
Emergency Operations Facility (EOF)	Designated location from which the Licensee Emergency Response Organization conducts the company's overall emergency response in coordination with Federal, State and designated emergency response organizations.
Emergency Operating Procedures (EOPs)	EOPs are step-by-step procedures for direct actions taken by ~~licensed reactor~~qualified operators to mitigate and/or correct an off normal plant condition through the control of plant systems.

Emergency Operations Center (EOC)	A facility designed and equipped for effective coordination and control of emergency operations carried out within an organization's jurisdiction. The site from which civil government officials (municipal, county, state, and Federal) exercise direction and control in a civil defense emergency.
Emergency Personnel	Those organizational groups that perform a functional role during an emergency condition. Within Exelon Nuclear, emergency personnel include the Managers and Directors of the Emergency Response Organization, accident assessment personnel, radiological monitoring teams, fire brigades, first aid teams and security personnel.
Emergency Planning Zones (EPZ)	That area surrounding a nuclear station in which emergency planning is conducted for the protection of the public. With respect to protecting the public from the plume exposure resulting from an incident, the EPZ is usually an area with a radius of about 10 miles surrounding the facility. With respect to the ingestion exposure pathway, the EPZ is usually an area with a radius of about 50 miles.
Emergency Preparedness	A state of readiness that provides reasonable assurance that adequate protective measures can and will be taken upon implementation of the E-Plan in the event of a radiological emergency.
~~Emergency Response Data System (ERDS)~~	~~ERDS is a continuous direct near real-time electronic data link between the licensee's onsite computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters.~~
Environmental Monitoring	The use of radiological instruments or sample collecting devices to measure and assess background radiation levels and/or the extent and magnitude of radiological contamination in the environment around the plant. This may be done in various stages such as pre-operational, operational, emergency, and post operational.
Essential Personnel	Essential personnel are those needed to achieve the goals and tasks as deemed necessary by the Station Emergency Director.
Evacuation	The urgent removal of people from an area to avoid or reduce high level, short-term exposure usually from the plume or from deposited activity.

Exclusion Area	An Exclusion Area is an area specified for the purpose of reactor site evaluation in accordance with 10 CFR 100. It is an area of such size that an individual located at any point on its boundary for two hours immediately following onset of the postulated release would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose of 300 rem to the thyroid from iodine exposure.
Exercise	An event that tests the integrated capability of a major portion of the basic elements existing within emergency preparedness plans and organizations.
Exercise Cycle	An eight-year period.
~~Fission Product Barrier~~	~~The fuel cladding, reactor coolant system boundary, or the containment boundary.~~
Hazardous Material	A substance or material which has been determined by the United States Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated in 49 CFR 172.
Health Physics Network (HPN) Line	In the event of a Site Area Emergency, the NRC HPN line will be activated by the NRC Operations center in White Flint, Maryland. This phone is part of a network that includes the NRC Regional Office and the NRC Operations Headquarters in White Flint, Maryland. This system is dedicated to the transmittal of radiological information by plant personnel to NRC Operations Center and the Regional office. HPN phones are located in the TSC and EOF.
~~High Radiation Sampling System~~	~~Post-accident sampling capability to obtain and perform radioisotopic and chemical analyses of reactor coolant and containment atmosphere samples.~~
Imminent	Mitigation actions have been ineffective and trended information indicates that the event or condition will occur within 2 hours.
Ingestion Exposure Pathway	The potential pathway of radioactive materials to the public through consumption of radiologically contaminated water and foods such as milk or fresh vegetables. Around a nuclear power plant this is usually described in connection with the 50-mile radius Emergency Planning Zone (50 mile EPZ).

Protective Action Guide (PAG)	Projected radiological dose values to individuals in the general population that warrant protective action. Protective Action Guides are criteria used to determine if the general population needs protective action regarding projected radiological doses, or from actual committed (measured) dose values.
Protective Action Recommendations (PARs)	Recommended actions to the States for the protection of the offsite public from whole body external gamma radiation, and inhalation and ingestion of radioactive materials. Access control and other recommendations concerning the safeguards of affected food chain processes may be issued by the States as PARs.
Public Alerting/Warning	The process of signaling the public, as with sirens, to turn on their TV's or radios and listen for information or instructions broadcast by state or local government authorities on the Emergency Alert System (EAS).
~~Puff Release~~	~~A controlled containment vent that will be terminated prior to exceeding 60 minutes in duration and is less than the limit as defined in the Station Annex.~~
Quarterly	Frequency of occurrence equal to once in each of the following four periods: January 1 through March 31; April 1 through June 30; July 1 through September 30; October 1 through December 31.
Recovery	The process of reducing radiation exposure rates and concentrations of radioactive material in the environment to levels acceptable for unconditional occupancy or use.
Release	A '*Release in Progress*' is defined as ANY radioactive release that is a result of, or caused by, the emergency event.
Restricted Area	Any area, access to which is controlled by Exelon for purposes of protection of individuals from exposure to radiation and radioactive materials.
Restricted Area Boundary	For classification and dose projection purposes, the boundary is a 400-meter (1/4-mile) radius around the plant. The actual boundary is specified in the ODCM.

Safety Analysis Report, Updated Final (UFSAR)	The UFSAR is a comprehensive report that a utility is required to submit to the NRC as a prerequisite and as part of the application for an operating license for a nuclear power plant. The multi-volume report contains detailed information on the plant's design and operation, with emphasis on safety-related matters.
Semi-Annual	Frequency of occurrence equal to once in each of the following periods: January 1 through June 30; July 1 through December 31.
Shall, Should, and May	The word "shall" is used to denote a requirement, the word "should" to denote a recommendation and the word "may" to denote permission, neither a requirement nor a recommendation.
Shielding	Any material or barrier that attenuates (stops or reduces the intensity of) radiation.
Site Boundary	Byron's Site Boundary is described in detail in the ODCM.
Site Evacuation	The evacuation of non-essential personnel from the plant site.
Source Term	Radioisotope inventory ~~of the reactor core,~~ or amount of radioisotope released to the environment, often as a function of time.
Technical Support Center (TSC)	A center outside of the Control Room in which information is supplied on the status of the plant to those individuals who are knowledgeable or responsible for engineering and management support of site~~reactor~~ operations in the event of an emergency, and to those persons who are responsible for management of the on-site emergency response.
Threshold Value	Measurable, observable detailed conditions which must be satisfied to determine an EAL applicability.
Thyroid Blocking Agent	An agent which when properly administered to an individual will result in sufficient accumulation of stable iodine in the thyroid to prevent significant uptake of radioiodine. Potassium Iodide is such an agent.
Total Effective Dose Equivalent (TEDE)	The sum of the deep dose equivalent (for external exposure) and the committed effective dose equivalent (for internal exposure) and 4 days of deposition exposure.

Unrestricted Area	Any area to which access is not controlled by the licensee for protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.
Vital Areas	Areas within the station security fence which contain vital equipment. Examples include Control Rooms, ~~Containment/~~Reactor Buildings, Turbine Buildings and Electrical Equipment Rooms.
Vital Equipment	Any equipment, system, device or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems which would be required to function to protect public health and safety following such failure, destruction, or release are also considered to be vital.
Weekly	Frequency occurrence equal to once per calendar week: Monday through Sunday.

Any abbreviation followed by a lower case 's' denotes the plural form of the term.

ACRONYMS

ac ..... alternating current

ALARA ..... as low as reasonably achievable

ANI ..... American Nuclear Insurers

ANS ..... Alert and Notification System

ANSI ..... American National Standards Institute

ARM ..... Area Radiation Monitor

ASLB ..... Atomic Safety Licensing Board

CB ..... citizen band

cc ..... cubic centimeter

CDE ..... Committed Dose Equivalent

CEOC ..... County Emergency Operation Center

CFR ..... Code of Federal Regulations

~~CHRMS ..... Containment High Range Monitoring System~~

~~CHRRMS ..... Containment High Range Radiation Monitoring System~~

cm2 ..... square centimeter

CNO ..... Chief Nuclear Officer

cpm ..... count per minute

CR ..... Control Room

CRO ..... Control Room Operator

CRT ..... Cathode Ray Tube

Cs ..... Cesium

dc ..... direct current

DEP ..... Drill and Exercise Performance

DEQ ..... Department of Environmental Quality

DFO ..... Disaster Field Office

DGI ..... Digital Graphics Incorporated

DHFS ..... Department of Health and Family Services

DLR ..... Dosimeter of Legal Record

DOE ..... U. S. Department of Energy

DOT ..... U. S. Department of Transportation

DPH ..... Department of Public Health

dpm ..... disintegration per minute

DQAP ..... Decommissioning Quality Assurance Program

EAL ..... Emergency Action Level

EAS ..... Emergency Alerting System

EMA ..... Emergency Management Agency

ENC ..... Emergency News Center

ENS ..... Emergency Notification System (NRC)

EOC ..... Emergency Operations (or Operating) Center

EOF ..... Emergency Operations Facility

EOP ..... Emergency Operating Procedure

EPA ..... U. S. Environmental Protection Agency

EPDS ..... Emergency Preparedness Data System

EPZ ..... Emergency Planning Zone

ERF ..... Emergency Response Facility

ESF ..... Engineered Safety Feature

FEMA ..... Federal Emergency Management Agency

FRMAC ..... Federal Radiological Monitoring and Assessment Center

FRMAP ..... Federal Radiological Monitoring and Assessment Plan

FRPCC ..... Federal Radiological Preparedness Coordinating Committee

FSAR ..... Final Safety Analysis Report

Ge .....Germanium

GET .....General Employee Training

GM ..... Geiger Mueller (radiation detection tube)

HEPA ..... high efficiency particulate air

HPN..... Health Physics Network (NRC)

hr .....hour

I ..... Iodine

IEMA ..... Illinois Emergency Management Agency

IRAP .....Interagency Radiological Assistance Plan

~~INPO .....Institute of Nuclear Power Operations~~

JIC.....Joint Information Center

LGEOC.....Local Government Emergency Operations Center

Li .....Lithium

~~LOCA .....Loss of Coolant Accident~~

LPZ.....Low Population Zone

MAELU..... Mutual Atomic Energy Liability Underwriters

MCP .....Municipal Command Post

mR.....milliroentgen

NARS .....Nuclear Accident Reporting System

NCRP ..... National Council on Radiation Protection

NOP ..... Nuclear Organization Procedure

NRC .....U. S. Nuclear Regulatory Commission

NRF..... National Response Framework

NRR ..... Nuclear Reactor Regulation (NRC)

NWS.....National Weather Service

NSRAC.....Nuclear Safety Review and Audit Committee

OSC .....Operations Support Center

PAG.....Protective Action Guide

PANS .....Prompt Alert and Notification System

PAR..... Protective Action Recommendation

~~PASS.....Post Accident Sampling System~~

~~QATR ..... Quality Assurance Topical Report~~

R..... roentgen

RAA.....Remote Assembly Area (off-site)

RAC.....Regional Advisory Committee (FEMA)

RAFT .....Radiological Assistance Field Team (ILLINOIS)

RAP ..... Radiological Assistance Plan (ILLINOIS)

REAC ..... Radiological Emergency Assessment Center (ILLINOIS)

REP ..... Radiological Emergency Preparedness

RERP ..... Radiological Emergency Response Plan

RMS .....Radiation Monitoring System

SCBA ..... Self Contained Breathing Apparatus

SEOC .....State Emergency Operations Center

SFCP..... State Forward Command Post

SPCC ..... Spill Prevention Control and Countermeasure

SPDS .....Safety Parameter Display System

Sr.....Strontium

SRC.....State Radiological Coordinator

SSC..... State Staging Center

~~STA .....Shift Technical Advisor~~

TDD.....Telecommunications Device for the Deaf

TEDE.....Total Effective Dose Equivalent

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Command and Control • 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.	(1) Shift Emergency Director	(1) Station Emergency Director	Not applicable	(1) Corporate Emergency Director
Communications[3] • Communicate EAL and PAR classifications to offsite response organizations (OROs), including the NRC, until relieved.	Shift Communicator[1]	(1) ENS Communicator (TSC)	Not applicable	(1) State / Local Communicator
Radiation Protection • 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.	(~~2~~1) Radiation Protection Personnel	(~~3~~2) Additional Radiation Protection Personnel *[In addition to personnel on-shift]* (OSC)	As needed ~~(3) Additional Radiation Protection Personnel *[In addition to personnel on-shift and those responding within 60 min.]* (~~	Not applicable

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	Augment w/in 60 min.
Emergency Classifications • Evaluate plant conditions and recommend emergency classifications, until relieved.	Not applicable~~Emergency Classification Advisor – Emergency Director~~[1]	(1) Operations Manager (TSC)	Not applicable	Not applicable
Engineering • Provide engineering coverage~~ related to the specific discipline of the assigned engineer,~~ until relieved.	Not applicable ~~(1) **Core/ Thermal Hydraulics Engineer - STA**[1]~~ ~~Evaluate reactor conditions.~~	(1) TSC Engineer: Provide engineering coverage for the ERO Additional Staff as Needed ~~**TSC Engineering Staff**~~ ~~(1) Electrical/ Instrumentation and Control (I&C): Provide engineering coverage for the ERO related to electrical or I&C equipment.~~ ~~(1) Mechanical: Provide engineering coverage for the ERO related to mechanical equipment.~~ ~~(1) Core/Thermal Hydraulics: Evaluate reactor conditions.~~	As needed	Not applicable

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Security	Security staffing per the site-specific security plan.	(1) **Security Coordinator (TSC)** • Coordinate security- related activities and information with the Emergency Coordinator.	Not applicable	Not applicable
Repair Team Activities	Not applicable	**Maintenance Personnel (OSC)** • (1) Electrical Maintenance Technician: Provide electrical support for ~~ECCS equipment,~~ event mitigation and equipment repair. • (1) Mechanical Maintenance Technician: Provide mechanical support for ~~ECCS equipment,~~ event mitigation and equipment repair.	**Maintenance Personnel (OSC)** • (1) I&C Technician: Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable. Additional I&C staff may be called out if needed. • Electrical Maintenance Technicians – As needed. • Mechanical Maintenance Technicians – As needed.	Not applicable
Supervision of Repair Team Activities	Not applicable	(1) **OSC Director** • Supervise OSC activities as	**OSC Supervisor(s)** As needed	Not applicable

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
		directed by Emergency Coordinator.	• ~~(1) Electrical Maintenance Supervisor /Lead: Supervise OSC activities related to electrical equipment.~~ • ~~(1) Mechanical Maintenance Supervisor / Lead: Supervise OSC activities related to mechanical equipment.~~ • ~~(1) I&C Supervisor / Lead: Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor.~~ • **(1) Radiation Protection Supervisor / Lead**[1]: Supervise OSC activities related to radiation protection.	
Field Monitoring Teams (FMTs)	Not applicable	**Onsite FM Individual** • (1) ~~Qualified individual~~RP Personnel to assess the	**Offsite FMT B** • (1) Qualified individual to assess the area(s) outside the	Not applicable

Attachment 3B

Byron Station

PROPOSED REVISION TO SITE EMERGENCY PLAN

Exhibit B
Radiological Emergency Plan Annex for Byron Station
(Procedure EP-AA-1002)
(Marked-Up Pages)

EXELON NUCLEAR

RADIOLOGICAL EMERGENCY PLAN ANNEX FOR BYRON STATION

Section 1: Introduction

As required in the conditions set forth by the Nuclear Regulatory Commission (NRC) for the operating license for the Byron Station, the management of Exelon recognizes its responsibility and authority to operate and maintain the nuclear power stations in such a manner as to provide for the safety of the general public.

The Byron Emergency Preparedness Program consists of EP-BY-1000, the Byron Radiological Emergency Plan (E-Plan), EP-AA-1002, Radiological Emergency Plan Annex for Byron Station, Exelon emergency plan implementing procedures, and associated program administrative documents. The Byron Station Radiological Emergency Plan outlines the basis for response actions that would be implemented in an emergency.

This document serves as the Byron Station Emergency Plan Annex and contains information and guidance that is unique to the station. This includes facility geography location for a full understanding and representation of the station's emergency response capabilities. The Station Annex is subject to the same review and audit requirements as the Byron Radiological Emergency Plan.

1.1 Facility Description

The Byron Station, Units 1 and 2, are located in Northern Illinois, approximately 3.7 miles south-southwest of the City of Byron in Ogle County. This site is situated near the center of the county in a predominantly agricultural area. At its closest approach, the Rock River is approximately 1.5 miles west of the western site boundary and 2.2 miles west-southwest of the actual plant location. Byron Station occupies approximately 1288 acres of land. The station site is somewhat rectangular in shape, with the plant structures occupying the southeast portion of the site. The units are permanently defueled.

Figure 1-1 shows the general location of Byron Station. More specific information on station siting may be found in the Updated Final Safety Analysis Report (UFSAR).

The plant ~~consists~~ consisted of two identical pressurized water reactor (PWR) nuclear steam supply systems (NSSS) and turbine generators furnished by Westinghouse Electric Corporation. Each nuclear steam supply system ~~is~~ was designed for a power output of 3645 MWt. Cooling for the plant is provided by ~~two natural draft cooling towers for nonessential service cooling water and by~~ mechanical draft cooling towers for essential service cooling water.

1.2 Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) for Byron Station is an area surrounding the station with a radius of about ten miles. (Exact boundaries are determined by the State of Illinois). Refer to Figure 1-1.

The ingestion pathway EPZ for Byron Station is an area surrounding the station with a radius of about 50 miles.

Section 4: Emergency Measures

Byron emergency response actions are covered by Section E of the Byron Radiological Emergency Plan.

4.1 Notification of the Emergency Organization

The Emergency Director is responsible for notifying the State of Illinois Emergency Management Agency (IEMA) via NARS. Ogle County will also be notified via NARS; however, IEMA will maintain responsibility of county notification. If a General Emergency is the initiating event, the Emergency Director is also responsible for notifying the following offsite agencies:

- Ogle County

4.2 Assessment Actions

Throughout each emergency situation, continuing assessment will occur. Assessment actions at Byron Station may include an evaluation of plant conditions; in plant, onsite, and initial offsite radiological measurements; and initial estimates of offsite doses. ~~Core damage information is used to refine dose assessments and confirm or extend initial protective action recommendations. Byron Station utilizes WCAP-14696-A, Revision 1, (1999) as the basis for the methodology for post-accident core damage assessment. This methodology utilizes real-time plant indications. In addition, Byron Station may use samples of plant fluids and atmospheres as inputs to the CDAM (Core Damage Assessment Methodology) program for core damage estimation.~~

4.3 Protective Actions for the Offsite Public

Protective actions concerning the public within the 10-mile EPZ involve prompt notification, evacuation and sheltering. Prompt notification involves the use of the permanently installed outdoor notification sirens located within the EPZ
To aid the Emergency Response Organization during a developing emergency situation, EP-AA-111, "Emergency Classification and Protective Action Recommendations" has been developed based on Section J.10.m of the Byron Radiological Emergency Plan.

4.3.1 Alert and Notification System (ANS) Sirens

The ANS consists of a permanently installed outdoor notification system within a ten-mile radius around the station. The ten-mile radius around the station is primarily an agricultural area with a population density below 2000 persons per square mile. The ANS as installed consists of mechanical and electronic sirens that will cover this entire area with a minimum sound level of 60 db. Additionally, the ANS will cover the heavily populated areas within the ten-mile radius around the station with a minimum sound level of 70 dB to ensure complete coverage.

Once the public has tuned to designated radio stations in an emergency, detailed instructional messages will be given to the public. State and local procedures provide for these messages.

Backup means of notification is achieved through Route Alerting, which is

contractor. These data are used to generate wind roses and to provide estimates of airborne concentrations of gaseous effluents.

5.2.1.1 Instrumentation

The meteorological tower is instrumented with equipment that conforms with the recommendations of Regulatory Guide 1.23 and ANSI/ANS 2.5 (1984). The equipment is placed on booms oriented into the generally prevailing wind at the site. Equipment signals are brought to an instrument shack with controlled environmental conditions. The shack at the base of the tower houses the recording equipment, signal conditioners, etc., used to process and re-transmit the data to the end point users.

5.2.1.2 Meteorological Measurement Program During a Disaster

Cooperation between the corporate office and the meteorological contract assures that a timely restoration of any outage can be made. Emergency field visits to the site are made as quickly as possible after detection of a failure.

Should a disaster of sufficient magnitude occur to destroy the tower structure, a contract is maintained to have a temporary tower erected within 72 hours, weather conditions permitting. Further, the meteorological contractor maintains two levels of sensors (wind speed, wind direction and temperature) in a state of readiness for use on the temporary tower.

Additionally, Exelon Nuclear's existing instrumented towers at other nuclear sites provide a high-density measurement network with multiple backup opportunities.

Meteorological data are available to the station Control Room, Technical Support Center, and Emergency Operations Facility for use in the Dose Projection Computer Model for estimating the environmental impact of unplanned releases of radioactivity from the station.

5.2.2 Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system; ~~post accident sampling capability;~~ portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.

5.2.2.1 Radiation Monitoring System

Chapters 11 and 12 of the Byron UFSAR describe the radiation monitoring system (RMS) in detail. The installed RMS is designed to continuously monitor ~~the containment atmosphere,~~ plant effluents, and various inplant locations.

5.2.2.3 Radioiodine and Particulate Effluent Monitoring

The General Atomic Company wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which utilizes a gamma spectrometer system detector. In addition, silver zeolite cartridges are available to further reduce the interference of noble gases.

5.2.2.4 Deleted ~~High-Range Containment Radiation Monitors~~

~~Two high range containment radiation monitors are installed for each operating reactor. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is 1 rad/hr to 10^7 rads/hr.~~

5.2.2.5 In-plant Iodine Instrumentation

Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using silver zeolite as a sample media. Auxiliary counting room locations have been identified within the Turbine Building. It is expected that a sample can be obtained and analyzed for iodine content within a two-hour time frame.

5.2.3 Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status ~~for all modes of operation~~ and is described in the Byron UFSAR. The operability of the post-accident instrumentation ensures information is available on selected plant parameters to monitor and assess important variables following an accident. Instrumentation is available to monitor the parameters and ranges given in Technical Specifications. ~~Byron Station Emergency Operating Procedures aid personnel in recognizing inadequate core cooling using applicable instrumentation.~~

5.2.4 Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) Standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble. In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

5.2.5 Facilities and Equipment for Offsite Monitoring

Consult Chapter 11 of the station specific Offsite Dose Calculation Manual (ODCM) for the most current location for fixed continuous air samplers and DLR locations. Byron Station maintains a supply of emergency equipment and supplies for offsite monitoring and sampling by environmental field teams.

5.2.6 Site Hydrological Characteristics

The hydrological characteristics of the Byron Station vicinity are described in the Byron UFSAR. The river screen house is the only structure that could be affected by flooding on the Rock River and is designed for a combined event flood, where a combined event flood is defined as a flood on the Rock River having a 1×10^{-6} annual probability of being exceeded at a 90% confidence level. All other Byron Station structures are 161 feet or more above the Probable Maximum Flood level of the Rock River.

The minimum design operating level of the essential service water makeup pumps is 3.8 feet lower than the water level for the 1-day 100-year low flow drought condition. In the unlikely event that emergency make-up water requirements cannot be satisfied by surface water withdrawals from the Rock River, groundwater wells will serve for makeup to the essential service water cooling towers.

Because of the site hydrological characteristics given above, plant operation should not be affected by Rock River water level conditions and therefore, hydrological monitors have not been installed. The Rock River is not used for any public water supply. There are no recorded plans for any future public water supply usage from the Rock River. The nearest surface water users downstream from Byron Station are on the Mississippi River over 115 miles away. This allows for sufficient mixing that makes permanently installed hydrological monitors unnecessary. In performing dose calculations from liquid releases, Byron Station uses a historical average river flow value, Fw, as a parameter in the liquid release model.

5.3 Protective Facilities and Equipment

The principal onsite assembly areas for Byron Station are the Machine Shop on the 401-foot elevation of the Service Building and the Unit #1 Turbine Building track-way. These areas are suitable because:

1. They are large open areas suitable for assembling a large number of people in a short time;
2. They can be easily exited if a site evacuation is deemed necessary following an assembly; and
3. They have a low probability of being affected by a serious radiological accident ~~involving the Reactor and its primary systems~~.

Attachment 3C

Byron Station

PROPOSED REVISION TO SITE EMERGENCY PLAN

Exhibit C
Byron Station Radiological Emergency Plan
(Procedure EP-BY-1000)
(Clean Pages)

EXELON NUCLEAR

BYRON STATION
RADIOLOGICAL EMERGENCY PLAN

2) State Agencies

a) The State of Illinois: The State of Illinois has the statutory responsibility and authority for protecting the health and safety of the public in Illinois. The State of Illinois has developed an "Illinois Plan for Radiological Accidents" (IPRA). This plan was developed in accordance with the guidance suggested by NUREG-0396 and NUREG 0654/FEMA-REP-1, Rev. 1. The IPRA has received 44 CFR 350 unconditional approvals from FEMA for all Exelon Nuclear's generating stations in the state of Illinois. Basic descriptions for the Illinois state agencies responsible for actions in the event of a nuclear power station are as follows:

- Governor of the State of Illinois: The Governor of the State of Illinois has overall command authority for both the radiological and non-radiological aspects of a nuclear incident. The Governor shall make the final recommendation for protective actions and shall serve as the state's primary spokesperson.

- Illinois Emergency Management Agency (IEMA): IEMA coordinates the operational response and recovery functions of all State agencies. IEMA proposes Protective Action Recommendations (PARs) to the Governor. IEMA also coordinates the implementation of the Governor's PARs.

  IEMA has the responsibility to inform the State of Wisconsin Department of Emergency Government (WDEG) with respect to an emergency event at Byron Nuclear Power Station that impacts the 50-mile Ingestion Pathway Zone.

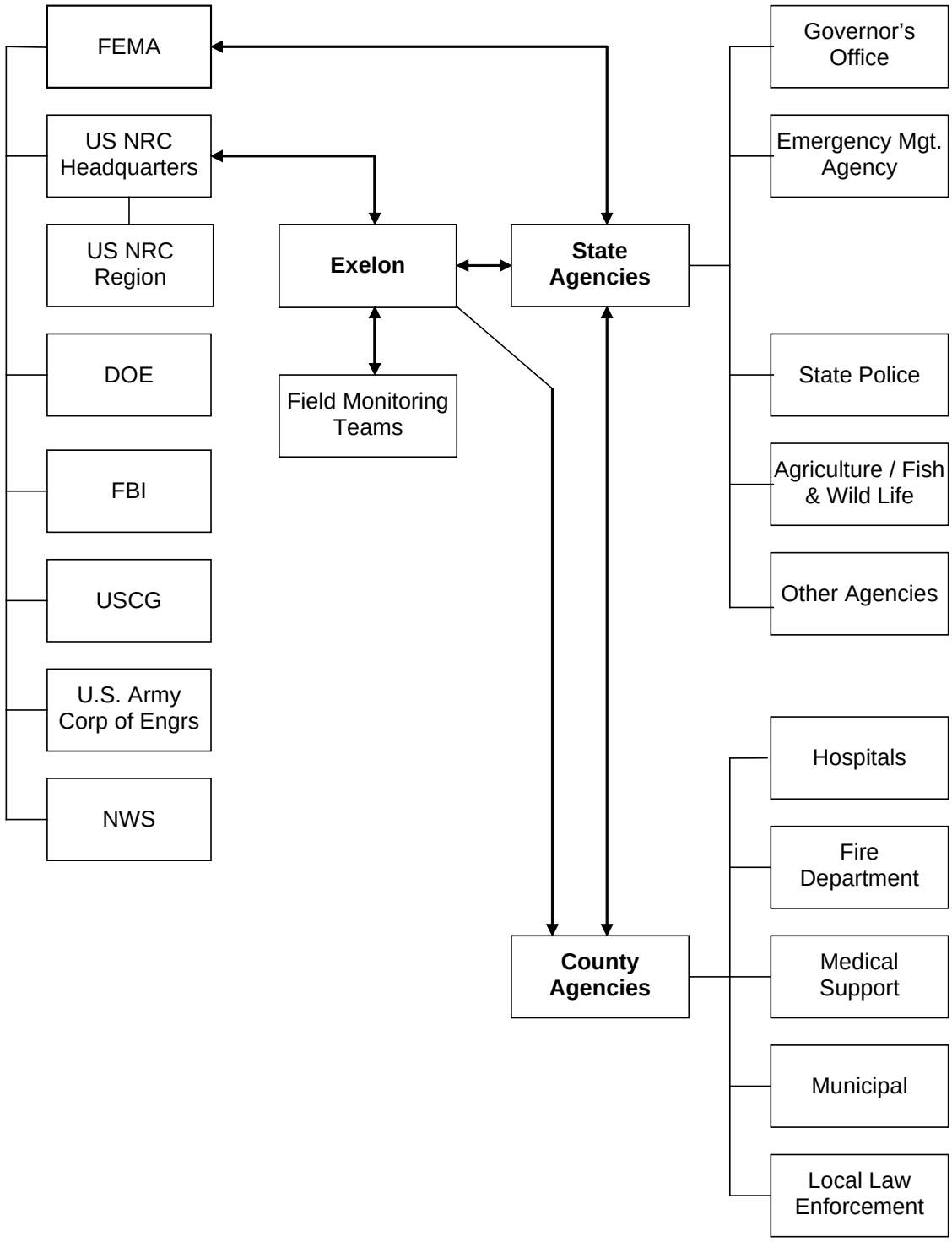
  IEMA has both the command authority for radiological aspects of a nuclear incident and the responsibility for performing various radiological functions. These functions include milk, water and food control, radiation exposure control for state emergency workers, and confirmatory accident assessment. During an emergency situation, IEMA Technical shall make protective action recommendations to the Governor.

  For events that impact the 50-mile ingestion pathway for Byron Nuclear Power Station, IEMA Technical will coordinate technical information with the State of Wisconsin.

  The IEMA Technical response to a nuclear incident utilizes two functional subgroups. They are the Radiological Emergency Assessment Center (REAC) and the Radiological Assessment Field Team (RAFT).

  – Radiological Emergency Assessment Center (REAC): IEMA has established REAC in Springfield Illinois. REAC will serve as the command location for all (State related) radiological aspects of a nuclear incident. The Manager of the Office of Nuclear Facility Safety, or his/her designated alternate, is in command of REAC.

Figure A-2: Agency Response Organization Interrelationships



Section B: Byron Nuclear Emergency Response Organization

This section describes the Byron Nuclear Emergency Response Organization (ERO), its key positions and associated responsibilities. It outlines the staffing requirements which provide initial emergency response actions and provisions for timely augmentation of on-shift personnel when required. It also describes interfaces among Exelon Nuclear emergency response personnel and specifies the offsite support available to respond to Byron Station.

1. On-Shift Emergency Response Organization Assignments

The normal plant personnel complement is established with the Station Plant Manager having overall authority for station operations. The Station Plant Manager directs the site organization in the management of the various departments while the Shift Manager retains the responsibility for actual operation of plant systems. Emergency Preparedness must consider the capabilities of the normal plant organization, the Station and Corporate Emergency Response Organizations of Exelon Nuclear, and the non-Exelon Nuclear Emergency Response agencies. The initial phases of an emergency situation at a nuclear station will most likely involve a relatively small number of individuals. These individuals must be capable of (1) determining that an emergency exists; (2) providing initial classification and assessment; and (3) promptly notifying other groups and individuals in the emergency organization. The subsequent phases of the emergency situation may require an increasing augmentation of the emergency organization.

Byron Station has personnel on shift at all times that can provide an initial response to an emergency event. ERO staffing tables, contained within this Emergency Plan outline the plant on-shift emergency organization and its relation to the normal staff complement. Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing all response actions in an Unusual Event or the initial actions of higher classifications.

On Shift Personnel

Byron station has the capability at all times to perform detection, mitigation, classification, and notification functions required in the early phases of an emergency. Shift augmentation and further ERO involvement will be determined by the extent and magnitude of the event.

Shift Manager: While acting as Shift Emergency Director, will take immediate action during an emergency and will activate the Station ERO, as appropriate. In the Shift Manager's absence or incapacitation, the line of succession is defined by Byron procedures.

Radiation Protection: The Station Radiation Protection personnel are responsible for the handling and monitoring of radioactive materials. Included in this organization are Health Physicists, Radiation Protection Supervisors and Technicians.

Security: The Station Security personnel are responsible for the physical security of the site. Included in this organization are Security Supervisors and Security Guards.

- Rescue operations and First Aid
- Decontamination
- Security of plant and access control
- Repair and damage control
- Personnel protection including Assembly, Accountability and Evacuation
- Communications

All Station ERO personnel shall have the authority to perform assigned duties in a manner consistent with the objectives of this plan.

1) Shift Manager (Shift Emergency Director) Control Room

A Shift Manager is on duty 24 hours a day and is the Shift Emergency Director in a declared emergency until relieved of this function. While serving in this capacity the Shift Manager is responsible for:

- Activating the ERO (as deemed appropriate or as procedurally required).
- Performing those duties outlined in Section B.5.a.2 for the Station Emergency Director.

The on-duty Shift Manager directs the activities of the operating crew and is responsible for the safe operation of the plant in compliance with the station NRC operating license and the station operating procedures. The Shift Manager, after relinquishing Command and Control, functionally reports to the Operations Manager in the TSC.

The Shift Manager's responsibilities, when not in Command and Control, are described below:

- The responsibility to adhere to the station Technical Specifications and to review routine operating data to assure safe operation;
- The responsibility to identify applicable EALs and emergency classifications; and
- The responsibility to adhere to plant operating procedures and the requirements for their use. During an emergency, operations personnel may depart from approved procedures where necessary to prevent injury to personnel, including the public, or damage to the facility consistent with the requirements of 10 CFR 50.54(x) and (y).
- Supervise the activities of the Control Room Crew.

- Assist in determining the priority assigned to OSC activities.
- Organize and direct medical response efforts for injured personnel.
- Ensure adequate staffing of the Control Room and TSC subordinates.
- Ensure the Shift Manager is informed of OSC staffing utilization and activities.
- Identify steps or procedures that the Operations staff should be utilizing to properly respond to the emergency condition.
- Assist the Station Emergency Director in evaluating changes in event classification.
- Supervise the activities of the ENS Communicator in the TSC.
- Act as the TSC liaison with the appropriate NRC Site Team Representative.

5) Technical Support Staff TSC

The TSC Technical Support Staff consists of the following minimum staff engineering position:

– TSC Engineer

In addition, station Engineering support will be augmented on an as needed basis to support accident assessment and mitigation activities.

6) Radiation Protection Manager (RPM) TSC

The Radiation Protection Manager reports to the Station Emergency Director. The TSC RPM directs staff in determining the extent and nature of radiological or hazardous material problems onsite. Responsibilities include:

- Accumulate, tabulate and evaluate data on plant conditions such as meteorological and radiological monitoring readings, and other pertinent data.
- Act as the TSC liaison with the appropriate NRC Site Team representative.
- Ensure use of protective clothing, respiratory protection, and access control within the plant as deemed appropriate to control personnel exposures.
- Ensure that appropriate bioassay procedures have been implemented for onsite personnel when a radioactivity incident has occurred.

- Act as the TSC liaison with the appropriate NRC Site Team representative.
- Assist the Radiation Protection Manager in determining personnel evacuation routes as necessary.
- Coordinate the evacuation of station non-essential personnel with the appropriate Local Law Enforcement Agencies (LLEAs).

8) Operations Support Center Director OSC

The OSC Director reports to the Emergency Director and supervises the activities of OSC personnel. Responsibilities include:

- Assign tasks as available:
  - I&C Maintenance
  - Mechanical Maintenance
  - Electrical Maintenance
  - Radiation Protection
- Coordinate with Operations in the dispatch of Operations personnel to support Control Room and OSC Team activities.
- Notify the Control Room and TSC prior to dispatch of any OSC teams into the plant.
- Maintain OSC resources including personnel, material, and equipment.
- Maintain accountability for all individuals dispatched from the OSC.
- Conduct periodic briefings on the overall plant status, emergency response activities, and station priorities.
- Assemble and dispatch the Field Monitoring Teams as required.

9) OSC RP Lead OSC

The OSC RP Lead assigned is responsible at all times for the safety of team personnel and to keep the OSC Director apprised of team status. Specifically, the OSC RP Lead are responsible for the managing and supervising RP personnel, including:

- Conduct of adequate pre-dispatch briefings.
- Ensuring adequate protective equipment and measures have been identified.

6. Byron Emergency Response Organization Block Diagram

ERO staffing tables contained in Appendix 5, lists the key positions of the ERO. Figures B-1a through B-1d illustrates the overall emergency response organization. Section B.5 discusses specific responsibilities and the interrelationships for key positions.

7. Exelon Corporate Emergency Response Organization

The Corporate ERO consists of the EOF Organization and the Emergency Public Information Organization. Personnel staffing these corporate organizations are covered in detail in Section B.5 of this plan.

The Corporate Emergency Response Organization is staffed by Exelon personnel, and operates out of the Emergency Operations Facility (EOF) and the Joint Information Center (JIC). The Corporate ERO is supported by News Media Spokespersons, environmental assessment staff and monitoring teams that provide long-term support to the affected station. Additionally, the Corporate ERO has long term liaison responsibilities with federal, state, and local authorities. These positions are further described in the EPIPs.

The Emergency News Center (ENC) function is responsible for the collection and analysis of event information and status, and development of Company news statements. This information is then communicated to the JIC Corporate Spokesperson. The ENC function may be located at either the EOF or the JIC.

The EOF is activated at an Alert. The EOF Organization is responsible for evaluating, coordinating and directing the overall company activities involved in the emergency response. Within the EOF, the Corporate Emergency Director shall assume Command and Control from the Shift Emergency Director when classification escalates to an Alert or higher, unless the EOF capabilities are limited such that the overall control and responsibility for PARs and offsite notifications cannot be assumed. The JIC is activated within 90 minutes of an Alert or higher. Some JIC functions may continue to be performed by the Exelon Communications organization until transferred to the JIC.

8. Industry/Private Support Organizations

Exelon Nuclear retains contractors to provide supporting services to nuclear generating stations. A contract/purchase order with a private contractor is acceptable in lieu of an agreement letter for the specified duration of the contract. Among services currently provided are the following:

a. Deleted

Figure B-1a: Byron Overall ERO Command Structure

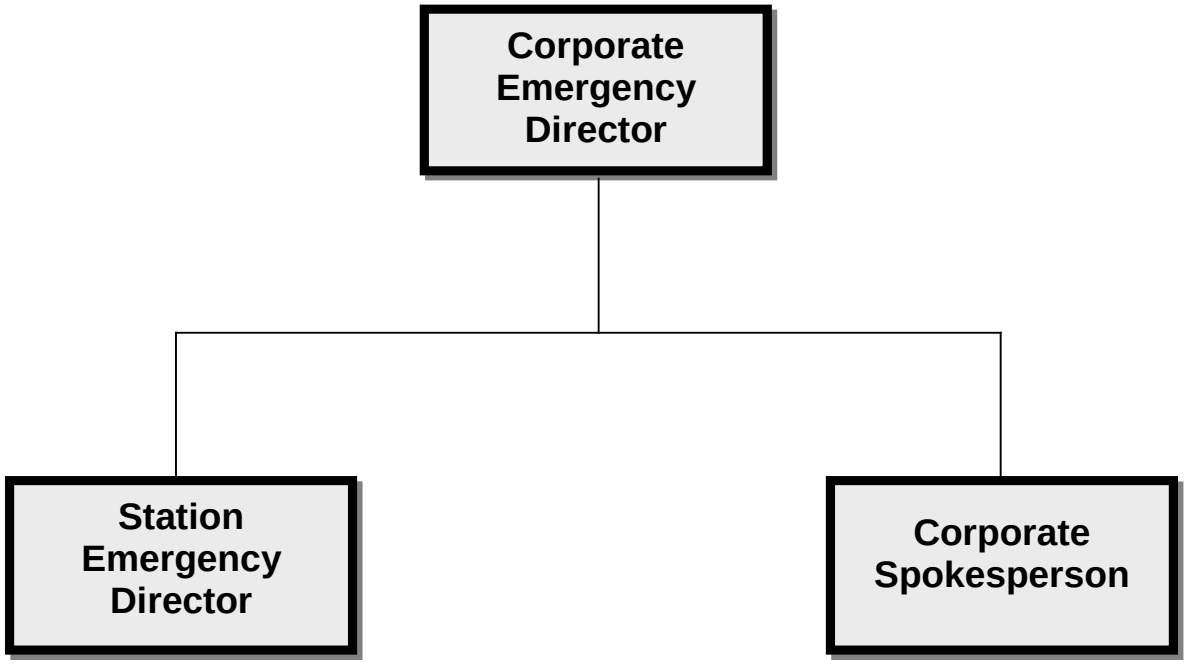
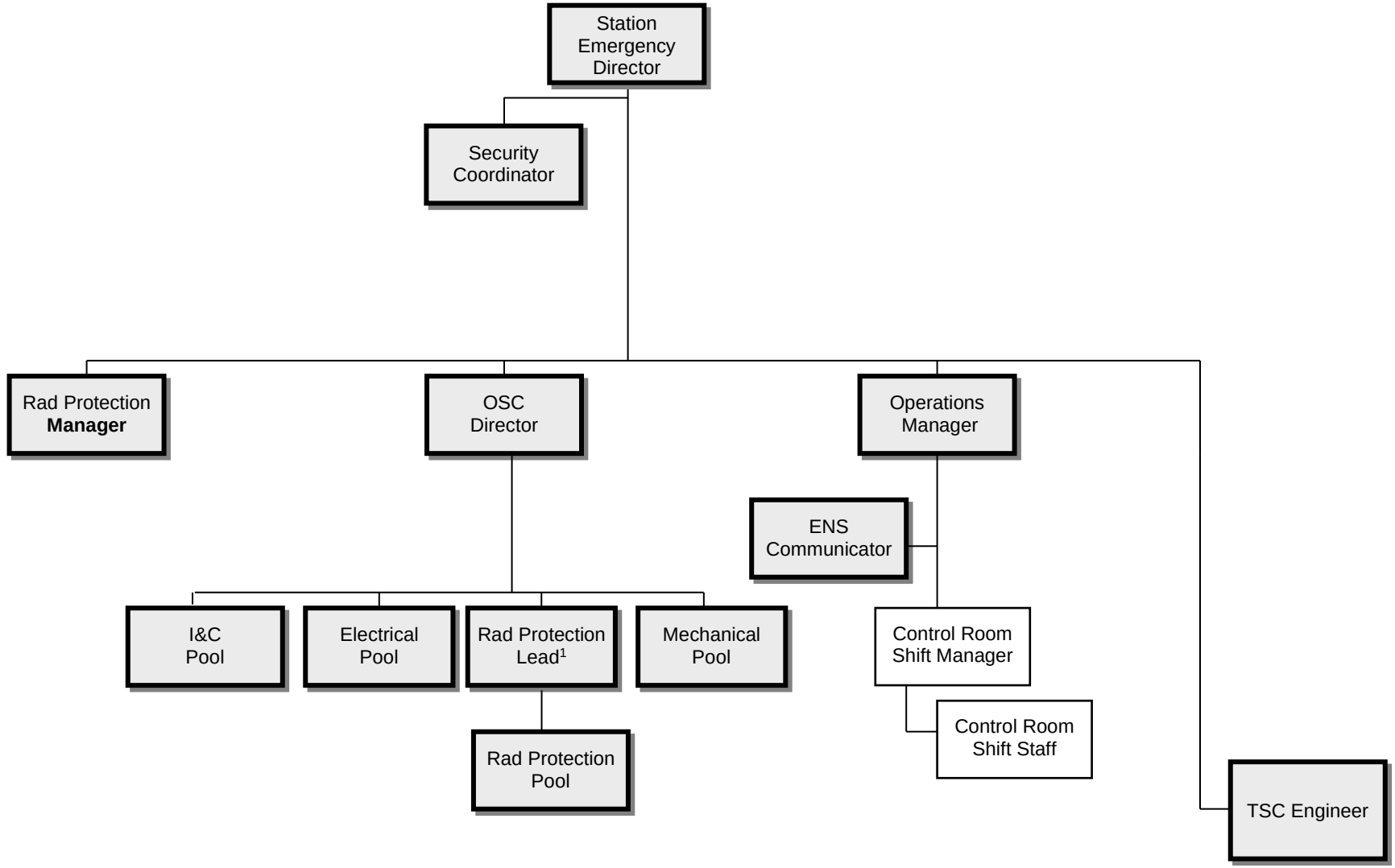


Figure B-1b: Emergency Onsite Organization



ERO response pool personnel do not include the on-shift complement.

[1] Rad Protection Lead responsibilities will be performed by a Rad Protection Pool responder as a collateral function.

- When the event is terminated, close-out is performed over communication links to offsite authorities participating in the response (i.e., NRC, state, county), followed by formal transmission of a state/local notification form within 24 hours.

b. Alert - Events are in process or have occurred which indicate an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of EPA Protective Action Guideline exposure levels.

The purpose of this classification is to ensure that emergency response personnel are readily available and to provide offsite authorities with current status information. An Alert will be classified as the initiating event or as escalation from an Unusual Event. In either case, the classification will most likely made by the Shift Manager (Shift Emergency Director) prior to the transfer of Command and Control.

Required actions at this classification include:

- Notifications to station management and the NDO.
- Notification, within 15 minutes, of the state and local communities. The EOF will assume state update responsibilities.
- Activation of the TSC, OSC, EOF, and the JIC organizations.
- Transfer of Command and Control.
- Notification of the NRC immediately after notification of the appropriate State and local agencies and not later than 60 minutes of classification.
- Notification of ANI.
- Assessment of the situation and response as necessary, which may include escalating to a higher classification if conditions warrant.
- On-site and off-site Field Monitoring Teams are sent to staging areas or dispatched to monitor for releases of radiation to the environment.
- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological and radiological data.
- When the event is terminated, notification is performed over communication links followed by an Initial Incident Report to offsite authorities participating in the response (i.e., NRC, state, county) within 8 hours.

c. Site Area Emergency - Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

   The purpose of this classification, in addition to those of the Alert level, is to ensure that all emergency response centers are staffed and provisions are made for information updates to the public through offsite authorities and the news media. The classification will most likely be made by the Station Emergency Director following activation of the TSC.

   Required actions at this classification, in addition to those listed under the Alert level, include:

   - If not previously performed, Assembly/Accountability shall be performed and Site Evacuation of non-essential personnel shall be initiated.

   - Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological data and projected or actual doses for any releases that have occurred.

d. General Emergency - Event(s) are in process or have occurred which involve actual or imminent substantial fuel degradation or melting or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

   The purpose of this classification, in addition to those of the Site Area Emergency level, is to initiate predetermined protective actions for the public and provide continuous assessment of information from monitoring groups. The classification will most likely be made by the Station Emergency Director following activation of the TSC.

   Required actions at this classification, in addition to those listed under the Alert and Site Area Emergency, include:

   - A Protective Action Recommendation will be determined.

   - Assessment of the situation and response as necessary.

e. Recovery: That period when the emergency phase is over and activities are being taken to return the situation to a normal state (acceptable condition). The plant is under control and no potential for further degradation to the plant or the environment is believed to exist.

   Recovery will be classified by the Station Emergency Director after obtaining authorization from the Corporate Emergency Director.

   Required actions at this classification include:

   - The affected state(s) and the NRC should be consulted prior to entry into Recovery.
   - Notifications will be made to station management, the NDO, state(s) and NRC.
   - A Recovery organization will be established to manage repairs to return the Unit to an acceptable condition, and support environmental monitoring activities as requested in coordination with Federal and state efforts.
   - ANI is notified of Recovery classification.

f. Classification Downgrading: Exelon Nuclear policy is that emergency classifications shall not be downgraded to a lower classification. Once declared, the event shall remain in effect until no Classification is warranted or until such time as conditions warrant classification to Recovery.

g. Guidance for Termination of an Emergency: The purpose of terminating an emergency is to provide an orderly turnover of plant control from the Emergency Response Organizations to the normal Exelon Nuclear plant organization. Termination of the emergency is authorized by the Emergency Director in Command and Control. The considerations provided in the Recovery/Termination Checklist in the emergency implementing procedures must be performed prior to exiting the emergency event. Consultation with governmental agencies and other parties should be conducted prior to termination of an event classified as Site Area or General Emergency. Notifications shall be transmitted to appropriate agencies to terminate an event.

h. Station Nuclear Security Plan: Byron has a Security Plan that complies with the requirements of 10 CFR 73. The interface between the E-Plan and the Security Plan is one of parallel operation. The plans are compatible. The E-Plan response measures, once initiated, are executed in parallel with measures taken in accordance with the Security Plan.

An emergency is classified after assessing abnormal plant conditions and comparing them to EAL Threshold Values for the appropriate Initiating Conditions. Classifications are based on the evaluation of each unit for multi-reactor sites. Matrix tables organized by recognition categories are used to facilitate the comparison.

All recognition categories should be reviewed for applicability prior to classification. The initiating conditions are coded with a letter and/or number designator. All initiating conditions, which describe the severity of a common condition (series), have the same initial designator.

3. Timely Classification of Events

Classification of an emergency condition occurs within 15 minutes after the availability of indications from plant instrumentation, plant alarms, computer displays, or incoming verbal reports that an EAL has been exceeded and, is then promptly made upon identification of the appropriate EAL. The 15-minute period encompasses all assessment, classification, and declaration actions associated with making an emergency declaration from the first availability of a plant indication or receipt of a report up to and including the declaration of the emergency.

Validation or confirmation of plant indications or reports of the condition are to be accomplished within the 15-minute period as part of the assessment. Since this validation or confirmation is being performed to determine the validity of an alarm, indication, or report, the 15-minute period starts with the availability of the alarm, indication, or report to any qualified EAL assessor, and not the completion of the validation or confirmation, because the former is the time that the information was first available.

A qualified EAL assessor means any member of the plant staff who, by training and experience, is qualified to assess the indications or reports for validity and to compare the same to the EALs. A qualified EAL assessor may be, but need not be, a Certified Fuel Handler, Non Certified Operator or member of the ERO. Qualified EAL assessors may be in the MCR or in another facility where emergency declarations are performed. A qualified EAL assessor does not include personnel such as chemists, radiation protection technicians, craft personnel, security personnel, and others whose positions require they report, rather than assess, abnormal conditions to the MCR.

The 15-minute criterion ends as soon it is determined that an EAL has been exceeded and upon identification of the appropriate Emergency Classification Level (ECL) and when the Emergency Director makes the emergency declaration. The emergency condition should be declared as soon as possible following the identification of the appropriate ECL. As used here, “promptly” means the next available opportunity unimpeded by activities not related to the emergency declaration, unless such activities are necessary for protecting health and safety.

b. Offsite: Notifications are promptly made to offsite emergency response organizations as follows:

1) State/Local Agencies: A notification shall be made within fifteen (15) minutes of:

- The initial emergency classification.
- Classification escalation.
- The issuance of or change to a Protective Action Recommendation (PAR) for the general public.
- Changes in radiological release status, occurring outside of an event classification or PAR notification, based on an agreement with the state(s).

The emergency warning points are simultaneously notified using the Nuclear Accident Reporting System (NARS), or a commercial telephone line as backup.

A notification will also be initiated to cognizant state/local government agencies as soon as possible but within one hour of the termination of an event classification, or entry into Recovery Phase.

2) Nuclear Regulatory Commission (NRC): An event will be reported to the NRC Operations Center immediately after notification of the appropriate state or local agencies but not later than one (1) hour after the time of initial classification, escalation, termination or entry into the Recovery Phase. The NRC is notified by a dedicated telephone system called the Emergency Notification System (ENS). If the ENS is inoperative, the required notification is made via commercial telephone service, other dedicated telephone service, or any other method that shall ensure that a report is made as soon as practical. An NRC Event Notification Worksheet should be utilized to transmit initial information to the NRC. If a continuous communication is requested and established, a log is used in lieu of the ENS Worksheet.

Specific requirements for the notifications to the NRC for classified emergency events are detailed in 10 CFR 50.72 with guidance provided in the Exelon Reportability Manual.

Mobilization of federal, state, and county response organizations is performed in accordance with their applicable emergency plan and procedures. At a minimum, mobilization of federal response organizations and activation of state and county EOCs is expected to occur at the declaration of a Site Area Emergency.

The state and county authorities are responsible for the process of notification of the general public.

c. Support Organizations: When an emergency is initially classified, escalated or terminated, notifications are promptly made to the following support organizations:

- Medical, rescue, and fire fighting support services are notified for assistance as the situation dictates.
- The American Nuclear Insurers (ANI) are notified at an Alert or higher classification with requests for assistance as necessary.
- Vendor and contractor support services are notified for assistance as the situation dictates.

3. Initial Notification Messages

Exelon Nuclear, in conjunction with state and county authorities, has established the contents of the initial notification message form transmitted during a classified emergency. The contents of the form include, as a minimum:

- Designation ("This is a Drill" or "Actual Event").
- Identity of site.
- Event classification.
- EAL number (as agreed upon with state authorities).
- Non-technical event description (as agreed upon with state authorities).
- Date and time of declaration (or entry into Recovery or Termination).
- Whether a release is taking place (Note: “Release” means a radiological release attributable to the emergency event.)
- Wind direction and speed.
- Whether offsite protective measures may be necessary.
- Potentially affected Subareas (or Sectors as applicable) when a General Emergency is declared.

Notification approval, transmittal date and time, and offsite agencies contacted are recorded either on the notification form or in an event logbook.

The ANS is operated by local governmental agencies and maintained by Exelon Nuclear. To assure the ANS is maintained in an operational readiness posture, the local agencies have agreed to test the system (by sounding the sirens) on a periodic basis that meets or exceeds FEMA guidance and to report inoperable equipment to EP-designated maintenance personnel. The goal of the testing and maintenance program is to identify inoperable equipment in a timely manner and to restore equipment to a functional status commensurate with FEMA operability requirements as referenced in FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants". In addition to this routine test and repair program, preventive maintenance of the ANS will be performed on an annual basis.

A more site-specific description of the various prompt public notification systems is presented in the Station Annex to the E-Plan. The activation of the ANS sirens, deployment of emergency service vehicles and operation of the Emergency Alerting System is discussed in detail in the state specific response plans.

7. Messages to the Public

The respective States have developed EAS messages for the public consistent with the classification scheme. These draft messages are included as part of the States' Emergency Plan and contain instructions with regard to specific protective actions to be taken by occupants and visitors of affected areas. Messages may include instructions such as: take shelter and go indoors, close windows and doors, turn off ventilation systems; directions given for evacuation; directions to stay tuned to specific stations for further information, ad-hoc respiratory protection, (e.g. handkerchief over mouth, etc.). Exelon will provide support for the content of these messages when requested. The States control the distribution of radioprotective drugs to the general public.

1) Nuclear Accident Reporting System (NARS): The NARS is a dedicated communications system that has been installed for the purpose of notifying state and local authorities of declared nuclear emergencies. This system links together the station Control Rooms, the EOF, TSCs and state and local authorities as appropriate.

2) Operations Status Line: An independent interfacility telephone link called the Operations Status Line that enables communication between the Control Room, the TSC, the OSC, and the EOF to monitor the activities throughout the Emergency Response Facilities (see Figure F-2). The Operations Status line consists of a dedicated Private Branch Exchange (PBX) Telephone System or a Voice Over Internet Protocol (VoIP) system.

3) Director's Hotline: A dedicated telephone link called the Director's Hotline that enables direct Emergency Director communication between the Control Room, TSC, and the EOF (see Figure F-2). The Directors Hotline consists of a dedicated PBX or a VoIP system.

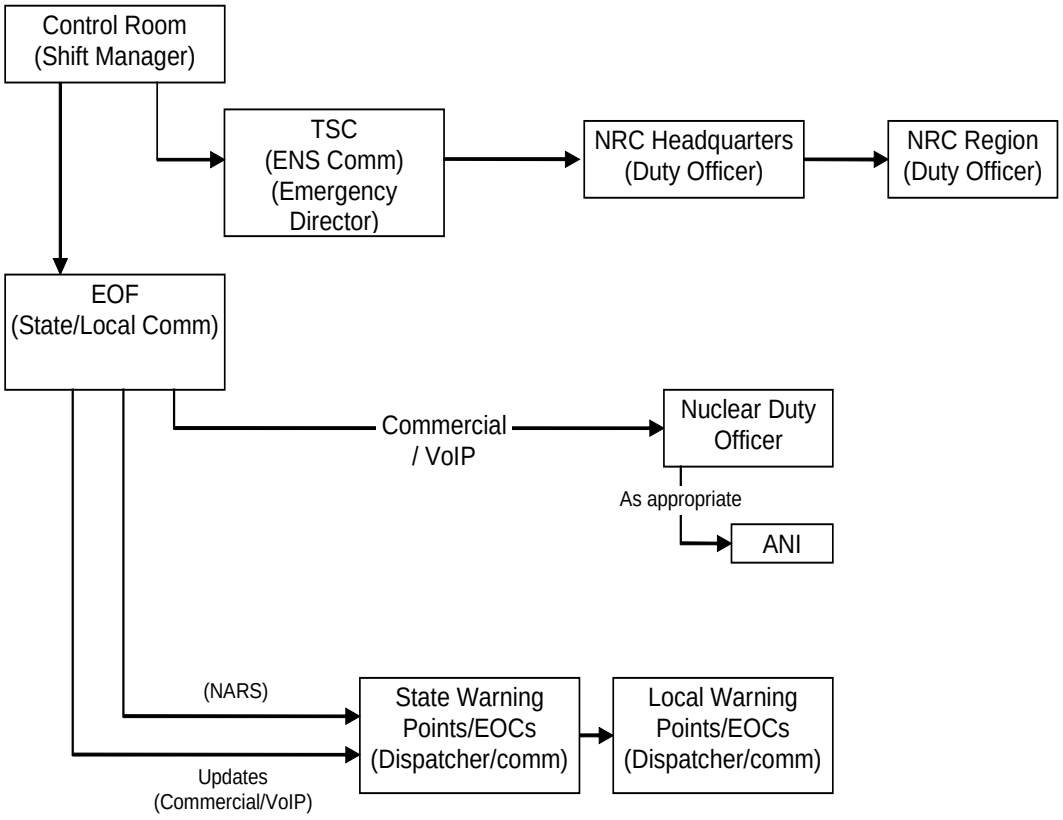
4) Local Commercial Telephone System: This system provides standard commercial telephone service through the public infrastructure, consisting of central offices and the wire line. The commercial vendor provides primary and secondary power for their lines at their central office.

5) Field Monitoring Team (FMT) Communications: A separate communications system has been installed to allow coordinated environmental monitoring and assessment during an emergency. This system consists of the necessary hardware to allow communication via Satellite Phones between TSC, EOF, and mobile units in Exelon Nuclear vehicles. Commercial cell phones are available as back up to the primary field team communications system.

In addition, station communication links exist to ensure appropriate information transfer capabilities during an emergency. The station may also utilize its Public Address System, station radios and notification devices to augment its emergency communications.

e. ERO Notification System: Exelon Nuclear utilizes an automated ERO Notification System to rapidly notify members of the ERO. The system consists of a network of physical infrastructure capable of initiating and receiving contact via multiple notification devices. When activated, the system contacts the notification devices (e.g., through commercial and cellular phone, email, text message) belonging to members of the ERO. The System includes redundant activation methods via the internet, call-centers, or direct telephone activation, as well as redundant, geographically separated call centers and data centers, with redundant power sources. Implementing procedures specify the course of action to be taken if the primary ERO Notification System activation path fails to respond. The ERO Notification System provides primary and back-up notification functions.

Figure F-1: Exelon Notification Scheme (For Full Augmentation)



Section H: Emergency Facilities and Equipment

Onsite and offsite facilities are available for emergency assessment, communications, first aid and medical care, and damage control. Of particular importance are the Emergency Response Facilities (ERFs); the Control Room (CR), the Technical Support Center (TSC), the Operations Support Center (OSC), the Emergency Operations Facility (EOF), and the Joint Information Center (JIC).

This section describes the emergency facilities and equipment used by the Emergency Response Organization and outlines the requirements which aid in timely and accurate response actions. It also describes the surveillance programs used to monitor and ensure that these facilities and equipment are maintained in a high degree of constant readiness.

1. Control Room, Technical Support Center, and Operations Support Center

Byron has established a TSC and an on-site OSC, which are activated upon declaration of an Alert or higher classification. Until they become operational, required functions of these facilities are performed in the Control Room.

Under certain adverse conditions for Security-Based Events, personnel may be assembled in an “ERO Alternative Facility” prior to being dispatched to one of the facility ERFs.

a. Station Control Room: The Control Room is the centralized onsite location from which the Nuclear Station's plant systems necessary to support the spent fuel pool are monitored. The Control Room is equipped with instrumentation to supply detailed information on the plant systems. The Control Room is continuously staffed with qualified operators. The Control Room is the first onsite facility to become involved with the response to emergency events. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency until such time that support centers can be activated. These activities shall include:

- Plant control.
- Initial direction of all plant related operations.
- Accident recognition, classification, mitigation and initial corrective actions.
- Alerting of onsite personnel.
- Notification of appropriate individuals.
- Activation of emergency response facilities and ERO notification.
- Notification of offsite agencies.
- Continuous evaluation of the magnitude and potential consequences of an incident.

Personnel in the TSC shall be protected from radiological hazards, including direct radiation and airborne contaminants under accident conditions with similar radiological habitability as Control Room personnel. To ensure adequate radiological protection, permanent radiation monitoring systems have been installed in the TSC and/or periodic radiation surveys are conducted. These systems indicate radiation dose rates and airborne radioactivity inside the TSC while in use. In addition, protective breathing apparatus (full-face air purifying respirators) and KI are available for use as required.

The TSC has access to a complete set of as-built drawings and other records, including general arrangement diagrams, P&IDs, and the electrical schematics. The TSC has the capability to record and display vital plant data, in real time, to be used by knowledgeable individuals responsible for engineering and management support of operations, and for implementation of emergency procedures.

c. Operations Support Center (OSC): Byron has established an OSC. The OSC is the onsite location to where station support personnel report during an emergency and from which they will be dispatched for assignments or duties in support of emergency operations. The OSC shall be activated whenever the TSC is activated, but need not remain activated at the Alert level if its use is judged unnecessary by the Station Emergency Director. At the Site Area and General Emergency levels, the OSC or an alternate OSC shall be activated at all times. The OSC is not activated for a HOSTILE ACTION when the Alternative Facility is implemented. Activation for other events is optional. Station disciplines reporting to the OSC include, but are not limited to:

- Operating personnel not assigned to the Control Room,
- Radiation Protection Personnel,
- Maintenance Personnel (mechanical, electrical and I&C).

Figure B-1b illustrates the staffing and organization for the OSC.

The OSC is equipped with communication links to the Control Room, the TSC and the EOF (see Section F). A limited inventory of supplies will be kept for the OSC. This inventory will include respirators, protective clothing, flashlights and portable survey instruments.

2. Emergency Operations Facility (EOF)

The EOF is the location where the Corporate Emergency Director will direct a staff in evaluating and coordinating the overall company activities involved with an emergency. Activation of the EOF is mandatory upon declaration of an Alert or higher classification. The EOF provides for:

- Management of overall emergency response.
- Coordination of radiological and environmental assessments.

It is the goal of the organization to be capable of activating the applicable Emergency Response Facility upon achieving minimum staffing. The facility can be declared activated when the following conditions are met:

a. Minimum staffing has been achieved.

b. The facility is functional.

The Director in charge may elect to activate their facility without meeting minimum staffing; if it has been determined that sufficient personnel are available to fully respond to the specific event (this would not constitute a successful minimum staff response).

5. Monitoring Equipment Onsite

Byron is equipped with instrumentation for seismic monitoring, radiation monitoring, fire protection and meteorological monitoring. Instrumentation for the detection or analysis of emergency conditions is maintained in accordance with station Technical Specifications, if applicable, or commitments made to the NRC. Descriptions of the equipment will appear in the Station Annex. This equipment includes but is not limited to the following:

a. Geophysical Monitors

1) Meteorological Instrumentation: A permanent meteorological monitoring station is located near each station for display and recording of wind speed, wind direction, and ambient and differential temperature for use in making offsite dose projections. Meteorological information is presented in the CR, TSC, and EOF by means of the plant computer system. This information is remotely interrogated using a computer or other data access terminal.

With regard to Exelon Nuclear's meteorological monitoring program, there has been a quality assurance program adopted from 10 CFR 50, Appendix B. However, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are not "safety related," not all aspects of 10 CFR 50, Appendix B, apply. Those aspects of quality assurance germane to supplying good meteorological information for a nuclear power station were adopted into the meteorological quality assurance program. The meteorological program is also subject to the requirements of the Decommissioning Quality Assurance Program.

The National Weather Service (NWS), or regional weather forecast providers, may be contacted during severe weather periods. These providers analyze national and local weather in order to provide localized weather forecasts for the system or for the station area as appropriate.

2) Seismic Monitoring: The seismic monitoring system measures and records the acceleration (earthquake ground motion) of the structure. Earthquakes produce low frequency accelerations which, when detected by the remote sensing devices, are permanently recorded as information which defines the response spectrum. The system remains in a standby condition until an earthquake causes the remote unit(s) to activate the recording circuits and tape transports. It also provides signals for immediate remote indication that specific preset response accelerations have been exceeded.

3) Hydrological Monitors: The design basis flood, probable maximum precipitation, and other improbable, conceivable extremes in hydrologic natural phenomena are well below any design limits for the station as detailed in the UFSAR.

b. Radiological Monitors and Sampling

1) The Radiation Monitoring System (RMS): In-plant radiological measurements provide information that may help determine the nature, extent and source of emergency conditions. The RMS is available to give early warning of a possible emergency and provides for a continuing evaluation of the situation in the Control Room. Radiation monitoring instruments are located at selected areas within the facility to detect, measure, and record radiation levels. In the event the radiation level should increase above a preset level, an alarm is initiated in the Control Room. Certain radiation monitoring instruments also alarm locally in selected areas of the facility. The RMS is divided into 3 subsystems:

a) Area Radiation Monitors (ARMs) are used for the direct measurement of in-plant exposure rates. The ARM readings allow in-plant exposure rate determinations to be made remotely without requiring local hand-held meter surveys. This information may be used, initially, to aid in the determination of plant area accessibility. In addition to permanent monitors, portable Continuous Air Monitors (CAMs) measure airborne particulate and airborne iodine activities at various locations within the operating areas.

b) Process Radiation Monitors (PRMs) are used for the measurement of radioactive noble gas, iodine, and particulate concentrations in plant effluent and other gaseous and fluid streams.

c) The accident, or high range, radiation monitoring system monitors radiation levels at various locations within the operating area. These are high range instruments used to track radiation levels under accident or post accident conditions.

The RMS provides the necessary activity or radiation levels required for determining source terms in dose projection procedures. Key RMS data is linked to the plant computer, which allows information to be passed to the TSC and EOF. The isotopic mix, including isotopes such as those in Table 3 of NUREG-0654, is based upon a default accident mix. Refer to the Byron UFSAR for further detail on the RMS capabilities and design.

2) Liquid and Gaseous Sampling Systems: The process sampling system consists of the normal sampling system and additional sampling panels located throughout the plant. Sampling systems are installed or can be modified to permit sampling even under severe accident conditions.

   The sampling systems use a number of manual sampling techniques to enable sampling operations over a wide range of plant conditions. It is capable of providing information relative to post-accident plant conditions to allow operator actions to be taken to mitigate and control the course of an accident. Refer to the Byron UFSAR for further detail on sampling capabilities.

3) Portable Radiation Monitoring Equipment: Portable radiation survey instruments are available for a wide variety uses such as area, sample, and personnel surveys and continued accident assessment. Instruments are stored throughout the plant and in the emergency facilities.

c. Process Monitors: The Control Room and applicable redundant backup locations are equipped with extensive plant process monitors for use in both normal and emergency conditions. These indications include but are not limited to liquid levels, flow rates, status or lineup of equipment components. This instrumentation provides the basis for initiation of corrective actions.

   1) Plant Monitoring/Information System: A plant monitoring/information system provides the data acquisition and database capability for performing plant monitoring and functions. The system is designed to scan, convert to engineering units, make reasonability and alarm limit checks, apply required transformations, store for recall and analysis, and display the reading of transformed data from plant instrumentation. The system scans flows, pressures, temperatures, fluid levels, radiation levels, equipment, and valve status at required frequencies. Scanned variables are quality tagged. The system provides for short and mid term storage of data for on-line retrieval and fast recall, and long term storage to appropriate media.

   2) Safety Parameter Display (SPDS) & Plant Parameter Display (PPDS) Systems: SPDS and PPDS provide a display of plant parameters from which the safety status of operation may be assessed in the Control Room, TSC and EOF. The primary function of the SPDS and PPDS is to help operating personnel in the Control Room make quick assessments of plant safety status. SPDS and/or PPDS displays in the TSC and EOF promote the exchange of information between these facilities and the Control Room and assists the emergency organization in the decision making process.

Section I: Accident Assessment

To effectively coordinate and direct all facets of the response to an emergency situation, diligent accident assessment efforts are required throughout the emergency. All four emergency classifications have similar assessment methods, however, each classification requires a greater magnitude of assessment effort dependent upon the plant symptoms and/or initiating event(s).

1. Plant Parameters and Corresponding Emergency Classification

Plant system and effluent parameter values are utilized in the determination of accident severity and subsequent emergency classification. Environmental and meteorological events are also determining factors in emergency classification. An emergency condition can be the result of just one parameter or condition change, or the combination of several. The specific symptoms, parameter values or events for each level of emergency classification are detailed in the emergency implementing procedures. Specific plant system and effluent parameters that characterize a classifiable event (EALs) are presented in Addendum 3 to each Station Annex.

In order to adequately assess the emergency condition, each emergency facility has the necessary equipment and instrumentation installed to make available essential plant information on a continuous basis. Evaluation of plant conditions is accomplished through the monitoring of plant parameters both from indication in the Control Room and within the plant. Some of the more important plant parameters to be monitored in the Control Room are assembled into a single display location, which is entitled the "Safety Parameter Display System" (SPDS). The SPDS monitors such parameters as: safety system status, and effluent monitor readings. The instrumentation and equipment capabilities available for each emergency facility are described in Section H.

2. Onsite Accident Assessment Capabilities

The resources available to provide initial and continuing information for accident assessment throughout the course of an event include plant parameter display systems, liquid and gaseous sampling system, Area and Process Radiation Monitoring Systems, and Accident Radiation Monitoring Systems. Descriptions of these systems are given in Section H.5.b.

3. Source Term Determination

Source term (or fuel damage) estimations serve several roles within the Exelon Emergency Preparedness Program. For planning purposes, fuel damage considerations are used as the bases for several of the Emergency Action Level (EAL) Initiating Conditions and as the threshold for the declaration of a General Emergency (the definition of a General Emergency specifies conditions which involve ‘substantial’ fuel degradation or melting as one of the bases for classification).

From an implementation perspective, fuel damage estimations provide a means of realistically differentiating between the fuel states (no damage, clad failure, and fuel melt) to:

- Evaluate the status of the fuel clad and how their status relates to the risks and possible consequences of the accident.
- Provide input on fuel configuration (coolable or uncoolable) for prioritization of mitigating activities.
- Determine the potential quality (type) and/or quantity (%) of source term available for release in support of projected offsite doses and protective action recommendations.
- Provide information that quantifies the severity of an accident in terms that can be readily understood and visualized.
- Support the determination of radiological protective actions that should be considered for long term recovery activities.
- The assessment methodologies utilized by Byron are intended to provide a rapid best estimate of fuel damage which, when evaluated together, help to develop an overall picture of the extent of fuel damage.

4. Effluent Monitor Data and Dose Projection

Dose assessment or projection represents the calculation of an accumulated dose at some time in the future if current or projected conditions continue. During an accident, the Plant Parameter Display System and personal computers will provide the ERO with the timely information required to make decisions. Radiological and meteorological instrumentation readings are used to project dose rates at predetermined distances from the station, and to determine the integrated dose received. Dose assessment methods used by Exelon personnel to project offsite doses include:

A. Monitored Release Points - This method utilizes the plant's effluent radiation monitors and system flow rates. Effluent release points are used to directly calculate a release rate. The point of the release determines the way the source term is affected and is adjusted by the dose assessment process.

B. Release Point Samples - This method uses a sample at the release point and an estimated flow rate to develop a release rate at the point of release.

C. Field Monitoring Team Data - This method uses a field survey or sample and the atmospheric model to back calculate a release rate and ratio concentrations of radioactive material at various points up and downwind of plume centerline.

The computer applications used to provide dose calculations are evaluated against the EPA-400 plume exposure Protective Action Guides (PAGs) applicable for the early phase of an accident. These evaluations place an emphasis on determining the necessity for offsite protective action recommendations. Dose assessment actions will be performed in the following sequence:

m. At a General Emergency classification, Exelon Nuclear will provide the state with recommendations for protective actions for the public. For incidents involving actual, potential, or imminent releases of radioactive material to the atmosphere, EPA 400-R-92-001, the NRC Response Technical Manual (RTM-96) and NUREG-0654, Supp. 3, Revision 1 are used as the basis for the general public PARs.

1) Plant Based PARs

Station specific PAR Flowcharts have been developed to aid Exelon Nuclear personnel providing PARs based on the above. Station specific PAR Flowcharts with Subarea or Sector tables are documented in the Exelon EP Implementing Procedures, including station-specific requirements regarding PAR determination. These flowcharts and tables provide technically based Protective Action Recommendations based on plant condition indicators as applicable to the Exelon site and described within the implementing procedures. Possible plant based PARs issued by Exelon Nuclear, in support of NUREG-0654 Supp. 3, at a General Emergency could include as appropriate for the Station:

- Response to a Rapidly Progressing Severe Accident.
- Utilization of the staged evacuation concept as determined by station ETE's.
- Shelter of the general public in response to but not limited to impediments to evacuation or Hostile Action event.
- Evacuation of the general public.

In addition to the above actions to minimize or prevent potential exposure to radiation, a recommendation of "monitor and prepare**"** will be issued for the remainder of the EPZ.

2) Dose Based PARs

Evacuation is recommended if projected doses reach the minimum EPA PAGs ($\geq$ 1 Rem EPA TEDE[1] or $\geq$ 5 Rem CDE Thyroid).

Many assumptions exist in dose assessment calculations, involving both source term and meteorological factors, which make computer predictions over long distances highly questionable. However, in the event dose assessment results indicate the need to recommend actions beyond the outer EPZ boundaries, which is past 10 miles, Field Monitoring Teams are dispatched to downwind areas to verify the calculated exposure rates prior to issuing PARs outside the EPZ. In the event dose assessment results indicate the need to recommend actions beyond the outer EPZ boundaries (past 10 miles):

[1] EPA TEDE is defined as the sum of the doses from external exposure and inhalation from the plume, and from 4 days of external exposure to deposited materials.

Establishment of Recovery can be conducted from any emergency classification level. However, it is possible that the lower classifications of Unusual Event and Alert will conclude with the event being terminated. There may be cases where certain EAL initiating conditions remain exceeded, but the station is under control and no further danger of degradation exists. In such a case, it may be appropriate to enter Recovery. Site Area and General Emergencies will require a Recovery Phase to be established prior to event termination. Exelon Nuclear may consult with/notify cognizant governmental agencies prior to declaring Recovery or event termination.

Termination/Recovery considerations are contained in the implementing procedures to provide guidance for evaluating the risk of entering Recovery without alleviating the intent of the Initiating Condition. The purpose of Recovery is to provide the necessary personnel to handle the long-term activities and to return the plant to an acceptable condition.

The following conditions are guidelines for the determination of establishing Recovery (this is not intended to be a complete list and additional criteria may apply, depending on the specifics of the event):

- The risk to the health and safety of the public has been mitigated.
- Plant parameters and equipment status have been established and controlled.
- In-plant radiation levels are stable or decreasing, and acceptable, given the plant conditions.
- The potential for uncontrolled releases of radioactive material to the environment has been eliminated.
- Environmental monitoring has been established.
- The radioactive plume has dissipated and plume tracking is no longer required (the only environmental assessment activities in progress are those necessary to assess the extent of deposition resulting from passage of the plume).
- Exelon Nuclear workers have been protected.
- Any security threat has been neutralized, and/or plant security is under the direction of Exelon Nuclear personnel.
- Adequate plant safety systems are operable.
- The fuel pool damage has been mitigated, or spent fuel damage has been contained and controlled.

- For events involving major damage to systems where offsite radioactive releases have occurred, (i.e. for Site Area Emergency or General Emergency classifications) the station recovery organization is put in place.

The specific members of the station recovery organization are selected based on the sequence of events that preceded the recovery activities as well as the requirements of the recovery phase. The basic framework of the station recovery organization is as follows:

a. The Recovery Director: The Corporate Emergency Director is initially designated as the Recovery Director. The Recovery Director is charged with the responsibility for directing the activities of the station recovery organization. These responsibilities include:

   - Ensuring that sufficient personnel, equipment, or other resources from Exelon and other organizations are available to support recovery.
   - Directing the development of a recovery plan and procedures.
   - Deactivating any of the plant Emergency Response Organization which was retained to aid in recovery, in the appropriate manner. Depending upon the type of accident and the onsite and offsite affects of the accident, portions of the ERO may remain in place after initiation of the recovery phase.
   - Coordinating the integration of available federal and state assistance into onsite recovery activities.
   - Coordinating the integration of Exelon support with federal, state and county authorities into required offsite recovery activities.
   - Approving information released by the public information organization which pertains to the emergency or the recovery phase of the accident.
   - Determining when the recovery phase is terminated.

b. The Recovery Plant Manager: The Station Manager or a designated alternate will become the Recovery Plant Manager. The Recovery Plant Manager reports to the Recovery Director and is responsible for:

   - Coordinating the development and implementation of the recovery plan and procedures.
   - Ensuring that adequate engineering activities to restore the plant, are properly reviewed and approved.
   - Directing all onsite activities in support of the station recovery effort.
   - Designating other Exelon recovery positions required in support of onsite recovery activities.

c. Medical Emergency Drills: A medical emergency drill, involving a simulated contaminated individual, and containing provisions for participation by local support services organizations (i.e., ambulance and support hospital) are conducted annually . Local support service organizations, which support more than one station, shall only be required to participate once each calendar year. The offsite portions of the medical drill may be performed as part of the required biennial exercise.

d. Radiological Monitoring Drills: Plant environs and radiological monitoring drills (onsite and offsite) are conducted annually. These drills include collection and analysis of all sample media (such as, water, vegetation, soil, and air), and provisions for communications and record keeping.

e. Health Physics Drills: Health Physics Drills involving a response to, and analysis of, simulated airborne and liquid samples and direct radiation measurements within the plant are conducted semi-annually. At least annually, these drills shall include a demonstration of the sampling system capabilities.

f. Augmentation Drills: Augmentation drills serve to demonstrate the capability of the process to augment the on-shift staff with a TSC, OSC and EOF in a short period after declaration of an emergency. These drills are conducted using the following methods:

- Quarterly, each station will initiate an unannounced off-hours ERO augmentation drill where no actual travel is required. Each region's Corporate ERO shall also perform an unannounced off-hours ERO augmentation drill that may be conducted independent of, or in conjunction with, a station drill.

- At least once per exercise cycle, an off-hours unannounced activation of the ERO Notification System with actual response to the emergency facilities is conducted by each station. Each region's Corporate ERO need only participate once per cycle.

g. Accountability Drills: Accountability drills are conducted annually. The drill includes identifying the locations of all individuals within the protected area.

3. Conduct of Drills and Exercises

Advance knowledge of the scenario will be kept to a minimum to allow "free-play" decision making and to ensure a realistic participation by those involved. Prior to the drill or exercise, a package will be distributed to the controllers and evaluators that will include the scenario, a list of performance objectives, and a description of the expected responses.

For each emergency preparedness exercise or drill conducted, a scenario package is developed that includes at least the following:

a. The basic objective(s) of the drill or exercise and the appropriate evaluation criteria.

Emergency response personnel in the following categories receive knowledge and/or performance based training initially and retraining thereafter once per calendar year not to exceed 18 months between training sessions.

a. Directors, Managers and Coordinators within the station and corporate ERO: Personnel identified by the Emergency Response Organization Telephone Directory as Directors, Managers and Coordinators for the station and corporate EROs receive training appropriate to their position in accordance with the approved ERO Training Program. These personnel receive specialized training in the areas of:

- Notifications
- Emergency Classifications
- Protective Action Recommendations
- Emergency Action Levels
- Emergency Exposure Control

Selected Directors, Managers, Coordinators and Shift Emergency Directors receive training in accordance with the approved ERO Training Program. Training in accident assessment sufficient to classify an event and to mitigate the consequences of an event are also covered.

b. Personnel Responsible for Accident Assessment:

The skills and knowledge required to perform plant stabilization and mitigation are a normal function of operations specific positions, as identified in Section B of this plan. Subsequent plant stabilization and restoration is pursued utilizing normal operating procedures. Qualified Operators receive routine training to ensure proficiency in this area.

1) Certified Fuel Handler shall have training conducted in accordance with the approved ERO Training Program such that proficiency is maintained on the topics listed below. These subjects shall be covered as a minimum on an annual basis.

- Event Classification.
- Protective Action Recommendations.
- Radioactive Release Rate Determination.
- Notification form completion and use of the Nuclear Accident Reporting System (NARS).
- Federal, state and local notification procedures as appropriate.
- Site specific procedures for activating the onsite and offsite ERO.

c. Radiological Monitoring Teams and Radiological Analysis Personnel

1) Offsite Radiological Monitoring: Offsite radiological monitoring is performed by trained individuals who provide samples and direct readings for dose assessment calculations and dose projection comparisons.

Personnel identified as members of Field Monitoring Teams receive training in accordance with the approved training program. Field Monitoring Team members receive classroom and hands-on training in the following areas:

- Equipment and Equipment Checks
- Communications
- Plume Tracking Techniques

2) Personnel Monitoring: Personnel monitoring is performed by trained individuals who monitor station personnel and their vehicles for contamination during an emergency. Personnel Monitoring Team members receive classroom and hands-on training in the following areas:

- Personnel Monitoring Equipment and Techniques
- Decontamination Techniques for Personnel
- Decontamination Techniques for Vehicles

3) Dose Assessment: Dose Assessment training includes the skills and knowledge necessary for calculation and interpretation of an offsite release and its impact on the environment under varying meteorological conditions. Individuals responsible for performing dose assessment are trained in the following areas:

- Computerized Dose Assessment
- Protective Action Recommendations
- Field Monitoring Team Interface
- Protective Action Guidelines associated with offsite plume exposure doses
- Basic Meteorology

Section P: Responsibility for the Maintenance of the Planning Effort

This section describes the responsibilities for development, review and distribution of the E-Plan and actions that must be performed to maintain the emergency preparedness program. It also outlines the criteria for insuring that personnel who perform the planning are properly trained.

1. Emergency Preparedness Staff Training

The Emergency Preparedness staff is involved in maintaining an adequate knowledge of state of the art planning techniques and the latest applications of emergency equipment and supplies. At least once each calendar year each member of the Emergency Preparedness staff is involved in one of the following activities:

- Training courses specific or related to emergency preparedness.
- Observation of or participation in drills and/or exercises at other stations.
- Participation in industry review and evaluation programs.
- Participation in regional or national emergency preparedness seminars, committees, workshops or forums.
- Specific training courses in related areas, such as systems, equipment, operations, radiological protection, or Problem Identification & Resolution (PI&R).

2. Authority for the Emergency Preparedness Effort

The Plant Manager is responsible for the safe and reliable operation of the station. The issuance and control of this plan and the activities associated with emergency preparedness at Byron shall be the overall responsibility of the Vice President, Fleet Support. This individual is assigned the responsibility for overall implementation of the E-Plan and station Annex.

3. Responsibility for Development and Maintenance of the Plan

Each regional Emergency Preparedness Manager is responsible for the overall radiological emergency preparedness program associated with the operation of the nuclear power stations within their respective region and to administer the program to ensure availability of resources in the event of an emergency. The regional Emergency Preparedness Managers report to an EP Director who in turn reports to the Vice President, Fleet Support.

The Emergency Preparedness Managers are assisted by regional corporate and Station Emergency Preparedness staff. Specific responsibilities include the following:

Program Administration

- Develop and maintain the E-Plan, Station Annex, implementing procedures and administrative documents.
- Develop and maintain 50.54(q) evaluations for changes to EP documents.
- Coordinate and maintain the EP Activities Schedule.
- Develop and maintain working relationships and coordinate meetings with Federal, state and local agencies.
- Ensure integration of plans between Exelon and offsite agencies.
- Provide an opportunity to discuss Emergency Action Levels and the availability of Nuclear Oversight audit results relating to interface with governmental agencies.
- Coordinate, negotiate and maintain agreements and contracts with offsite agencies and support organizations.
- Obtain Letters of Agreement with medical facilities, and medical consultants specifically skilled in the medical aspects of radiation accidents and other medical consultants as might be necessary for the case of a person involved in a radiation incident.
- Coordinate the development and annual distribution of the station's public information publication.
- Coordinate and administer the Self Evaluation Program to monitor and evaluate the adequacy of the Emergency Preparedness Program.
- Coordinate and support EP Self-Assessments, Audits and Inspections.
- Ensure the documentation and resolution of adverse conditions in the emergency preparedness program discovered through drills, audits, etc. in accordance with the Exelon Nuclear Corrective Action Program.
- Coordinate and develop Operational Experience responses.
- Coordinate, document and review Performance Indicator data and reports.
- Provide oversight of Drill and Exercise Performance (DEP) evaluations during Operator Training.
- Coordinate and conduct EP Event reviews and reports.

The E-Plan and its Annex shall be revised as needed and the most current approved revisions shall remain in effect so long as they are certified as current. Revisions to the E-Plan are reviewed by the Station Review Committee (SRC) prior to approval. Changes to the plan are made without NRC approval only if such changes do not result in a reduction in effectiveness of the plan per 10 CFR 50.54(q), and the plan as changed continues to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E. Proposed changes that reduce or have a potential to reduce the effectiveness of the approved plan are not implemented without prior approval by the NRC.

- Proposed revisions to the E-Plan and Station Annex shall be completed in accordance with the Exelon Nuclear review and approval processes.

- E-Plan and Station Annex changes shall be categorized as (1) minor/ administrative or (2) significant programmatic changes. Minor/administrative changes shall be implemented within 30 days of approval. Significant programmatic changes shall be implemented as soon as practical and within 60 days of final approval .

- After review and approval, the E-Plan and Station Annex shall be:

  a) Reviewed by the applicable Emergency Preparedness Manager(s) and EP Director, or designee(s), and

  b) Approved for use by the Vice President, Fleet Support or designee.

- The Implementing Procedures shall be developed and revised concurrent with the E-Plan and Annex, and reviewed every two years.

Annually, each Letter of Agreement is reviewed and certified current in order to assure the availability of assistance from each supporting organization not already a party to the individual State Plan for Radiological Accidents.

5. E-Plan Distribution

E-Plan manuals, Station Annex and implementing procedures are distributed on a controlled basis to the Emergency Response Facilities. All controlled documents holders are issued revision changes upon approval. Selected Federal, state, and local agencies, and other appropriate locations requiring them are also issued copies. Procedures are in place that control the revision of the E-Plan and require the use of revision bars and individual page identifications (i.e. section of plan, revision number, etc.).

6. Supporting Emergency Response Plans

Other plans that support this E-Plan are:

- NUREG-1471, US Nuclear Regulatory Commission, "Concept of Operations: NRC Incident Response"

- National Response Framework (NRF), Nuclear/Radiological Incident Annex.
- Illinois Plan for Radiological Accidents (IPRA).
- State of Wisconsin Peacetime Radiological Emergency Response Plan.
- Department of Energy, Region 5, “Radiological Assistance Plan"
- Nuclear Station Security Plans - Note: The Station Security Plan contains industrial security information that must be withheld from public disclosure under provisions of 10 CFR 2.790(d).

7. Implementing and Supporting Procedures

Appendix 2 of this plan contains a listing, by number and title, of those procedures that implement this plan during an emergency. Additionally, administrative procedures that outline the steps taken to maintain the Exelon Emergency Preparedness Program have been developed and are listed in Appendix 2.

8. Cross Reference to Planning Criteria

The Plan is formatted in the same manner as NUREG-0654, FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants." The use of this format lends itself to uncomplicated comparison of the criteria set forth in NUREG-0654, FEMA-REP-1.

9. Audit/Assessment of the Emergency Preparedness Program

To meet the requirements of 10 CFR 50.54(t), Exelon Nuclear Oversight shall coordinate an independent review the Emergency Preparedness Program to examine conformance with 10 CFR 50.47, 10 CFR 50.54, and 10 CFR 50 Appendix E. Included in the audit/assessment are the following:

- The E-Plan and associated implementing procedures.
- The Emergency Preparedness Training Program including drills and exercises.
- The readiness of the station Emergency Response Organization to perform its function.
- The readiness of facilities and equipment to perform as outlined in the plan and procedures.
- The interfaces between Exelon, the state, and county governmental agencies pertaining to the overall Emergency Preparedness Program.

Results of this audit are submitted for review to Corporate Management and the Plant Manager. The Emergency Preparedness Manager ensures that any findings that deal with offsite interfaces are reviewed with the appropriate agencies. Written notification will be provided to the state and counties of the performance of the audit and the availability of the audit records for review at Exelon facilities. Records of the audit are maintained for at least five years.

10. Maintenance of Emergency Organization Telephone Directory

Names and phone numbers of the Emergency Response Organization and support personnel shall be reviewed and updated at least quarterly.

18. NUREG-0737, Clarification of TMI Action Plan Requirements, dated October 1980.

19. NUREG-0737, Supplement 1, Requirements for Emergency Response Capability, December 1982.

20. NUREG 0728 - "Report to Congress: NRC Incident Response Plan."

21. US NRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," revision 4, July, 2003.

22. U.S. NRC Response Technical Manual (RTM-96)

23. NEI 99-01, Methodology for Development of Emergency Action Levels.

24. EPA 400-R-92-001, October 1991, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents."

25. FEMA-REP-10, Guide for Evaluation of Alert and Notification Systems for Nuclear Power Plants

26. FEMA-REP-14, Exercise Evaluation Methodology

27. FEMA-Guidance Memorandum, MS-1 "Medical Services"

28. Exelon Decommissioning Quality Assurance Program (DQAP), NO-DC-10

29. Deleted

30. Deleted

31. "Federal Bureau of Investigation and Nuclear Regulatory Commission Memorandum of Understanding for Cooperation Regarding Threat, Theft, or Sabotage in U.S. Nuclear Industry," Federal Register, Vol. 44, p. 75535, December 20, 1979.

32. Illinois Department of Nuclear Safety, Title 32, Chapter II, Subchapter b, Part 340, "Standards for Protection Against Radiation."

33. ComEd April l983 response to NUREG 0737 Supplement #1 or latest submitted schedule of planned operational dates.

34. "Voluntary Assistance Agreement By and Among Electric Utilities involved in Transportation of Nuclear Materials," dated November 1, 1980.

35. Comprehensive Environmental Response, Compensation and Liability Act of 1980.

36. Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendation for State and Local Agencies, Volume 47, No. 205, October 22, 1982.

37. American Nuclear Insurers Bulletin #5B (1981), "Accident Notification Procedures for Liability Insureds".

38. "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency: Final Recommendations on Use," Federal Register Vol. 47, No. 125, June 29, 1982.

39. Letter from William J. Dircks, Executive Director for Operations, NRC, to Dr. Donald F. Knuth, President KMC, Inc. dated October 26, 1981.

40. Deleted

41. Babcock and Wilcox Company, Post Accident Sample Offsite Analysis Program (1982).

42. ANI/MAELU Engineering Inspection Criteria For Nuclear Liability Insurance, Section 6.0, Rev. 1, "Emergency Planning."

43. NRC RIS 2006-12, Endorsement of Nuclear Energy Institute Guidance “Enhancement to Emergency Preparedness Programs for Hostile Action.”

44. NRC Bulletin 2005-02, “Emergency Preparedness and Response Actions for Security-Based Events.”

45. NRC Information Notice 2009-01, National Response Framework

Appendix 3: List of Corporate Letters of Agreements

Organization/Agreement Type

Department Of Energy (DOE) Radiation Emergency
Assistance Center/Training Site, REAC/TS (Letter on File)
Medical Consultant

Environmental, Inc. (P.O.)
Radiological Environmental Monitoring

Landauer, Inc. (P.O.)
Emergency Dosimetry

Murray & Trettel, Inc. (P.O.)
Meteorological Support

Amita Health St. Joseph Hospital (Letter on File)
Back-up Emergency Medical Facility

Teledyne Brown Engineering (P.O.)
Bioassay Analysis/Radiochemical Analysis

Westinghouse Electric Company, PWRs (Letter on File)
PWR Emergency Support

J.D Ingenuities (P.O.)
Emergency Met Tower

National Foam, Inc.
Fire Foam Supply

Appendix 4: Glossary of Terms and Acronyms

Accident Assessment	Accident assessment consists of a variety of actions taken to determine the nature, effects and severity of an accident and includes evaluation of damage assessment reports, meteorological observations, seismic observations, fire reports, radiological dose projections, in plant radiological monitoring, and environmental monitoring.
Activation	(1) "ERO Activation" is the process of initiating actions to notify and mobilize Emergency Response Organization (ERO) personnel following an event classification under the emergency plan. (2) "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).
Annual	Frequency of occurrence equal to once per calendar year, January 1 to December 31.
Assembly/Accountability	A procedural or discretionary protective action taken for all persons within the security "Protected Area", which involves the gathering of personnel into pre-designated areas, and the subsequent verification that the location of these personnel is known.
Assessment Actions	Those actions taken during or after an emergency to obtain and process information that is necessary to make decisions to implement specific emergency measures.

Drill	A supervised instruction period aimed at testing, developing and maintaining skills in a particular operation.
Early Phase	The period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must be based primarily on predictions of radiological conditions in the environment. This phase may last from hours to days. For the purposes of dose projections it is assumed to last four days.
Emergency Action Levels (EALs)	A pre-determined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.
Emergency Alert System (EAS)	A network of broadcast stations and interconnecting facilities which have been authorized by the Federal Communications Commission to operate in a controlled manner during a war, state of public peril or disaster, or other national or local emergency. In the event of a nuclear reactor accident, instructions/notifications to the public on conditions or protective actions would be broadcast by state or local government authorities on the EAS.
Emergency Director	Individual in Command and Control. One of the following: the Shift Emergency Director (Control Room), Station Emergency Director (TSC) or the Corporate Emergency Director (EOF).
Emergency Notification System (ENS)	The NRC Emergency Notification System hot line is a dedicated telephone system that connects the plant with NRC headquarters in White Flint, Maryland. It is directly used for reporting emergency conditions to NRC personnel.
Emergency Operations Facility (EOF)	Designated location from which the Licensee Emergency Response Organization conducts the company's overall emergency response in coordination with Federal, State and designated emergency response organizations.
Emergency Operating Procedures (EOPs)	EOPs are step-by-step procedures for direct actions taken by qualified operators to mitigate and/or correct an off normal plant condition through the control of plant systems.

Emergency Operations Center (EOC)	A facility designed and equipped for effective coordination and control of emergency operations carried out within an organization's jurisdiction. The site from which civil government officials (municipal, county, state, and Federal) exercise direction and control in a civil defense emergency.
Emergency Personnel	Those organizational groups that perform a functional role during an emergency condition. Within Exelon Nuclear, emergency personnel include the Managers and Directors of the Emergency Response Organization, accident assessment personnel, radiological monitoring teams, fire brigades, first aid teams and security personnel.
Emergency Planning Zones (EPZ)	That area surrounding a nuclear station in which emergency planning is conducted for the protection of the public. With respect to protecting the public from the plume exposure resulting from an incident, the EPZ is usually an area with a radius of about 10 miles surrounding the facility. With respect to the ingestion exposure pathway, the EPZ is usually an area with a radius of about 50 miles.
Emergency Preparedness	A state of readiness that provides reasonable assurance that adequate protective measures can and will be taken upon implementation of the E-Plan in the event of a radiological emergency.
Environmental Monitoring	The use of radiological instruments or sample collecting devices to measure and assess background radiation levels and/or the extent and magnitude of radiological contamination in the environment around the plant. This may be done in various stages such as pre-operational, operational, emergency, and post operational.
Essential Personnel	Essential personnel are those needed to achieve the goals and tasks as deemed necessary by the Station Emergency Director.
Evacuation	The urgent removal of people from an area to avoid or reduce high level, short-term exposure usually from the plume or from deposited activity.

Exclusion Area	An Exclusion Area is an area specified for the purpose of reactor site evaluation in accordance with 10 CFR 100. It is an area of such size that an individual located at any point on its boundary for two hours immediately following onset of the postulated release would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose of 300 rem to the thyroid from iodine exposure.
Exercise	An event that tests the integrated capability of a major portion of the basic elements existing within emergency preparedness plans and organizations.
Exercise Cycle	An eight-year period.
Hazardous Material	A substance or material which has been determined by the United States Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated in 49 CFR 172.
Health Physics Network (HPN) Line	In the event of a Site Area Emergency, the NRC HPN line will be activated by the NRC Operations center in White Flint, Maryland. This phone is part of a network that includes the NRC Regional Office and the NRC Operations Headquarters in White Flint, Maryland. This system is dedicated to the transmittal of radiological information by plant personnel to NRC Operations Center and the Regional office. HPN phones are located in the TSC and EOF.
Imminent	Mitigation actions have been ineffective and trended information indicates that the event or condition will occur within 2 hours.
Ingestion Exposure Pathway	The potential pathway of radioactive materials to the public through consumption of radiologically contaminated water and foods such as milk or fresh vegetables. Around a nuclear power plant this is usually described in connection with the 50-mile radius Emergency Planning Zone (50 mile EPZ).
Initiating Condition	A predetermined UNIT condition where either the potential exists for a radiological emergency or such an emergency has occurred.

Public Alerting/Warning	The process of signaling the public, as with sirens, to turn on their TV's or radios and listen for information or instructions broadcast by state or local government authorities on the Emergency Alert System (EAS).
Quarterly	Frequency of occurrence equal to once in each of the following four periods: January 1 through March 31; April 1 through June 30; July 1 through September 30; October 1 through December 31.
Recovery	The process of reducing radiation exposure rates and concentrations of radioactive material in the environment to levels acceptable for unconditional occupancy or use.
Release	A '*Release in Progress*' is defined as ANY radioactive release that is a result of, or caused by, the emergency event.
Restricted Area	Any area, access to which is controlled by Exelon for purposes of protection of individuals from exposure to radiation and radioactive materials.
Restricted Area Boundary	For classification and dose projection purposes, the boundary is a 400-meter (1/4-mile) radius around the plant. The actual boundary is specified in the ODCM.
Safety Analysis Report, Updated Final (UFSAR)	The UFSAR is a comprehensive report that a utility is required to submit to the NRC as a prerequisite and as part of the application for an operating license for a nuclear power plant. The multi-volume report contains detailed information on the plant's design and operation, with emphasis on safety-related matters.
Semi-Annual	Frequency of occurrence equal to once in each of the following periods: January 1 through June 30; July 1 through December 31.
Shall, Should, and May	The word "shall" is used to denote a requirement, the word "should" to denote a recommendation and the word "may" to denote permission, neither a requirement nor a recommendation.
Shielding	Any material or barrier that attenuates (stops or reduces the intensity of) radiation.
Site Boundary	Byron's Site Boundary is described in detail in the ODCM.

Site Evacuation	The evacuation of non-essential personnel from the plant site.
Source Term	Radioisotope inventory or amount of radioisotope released to the environment, often as a function of time.
Technical Support Center (TSC)	A center outside of the Control Room in which information is supplied on the status of the plant to those individuals who are knowledgeable or responsible for engineering and management support of site operations in the event of an emergency, and to those persons who are responsible for management of the on-site emergency response.
Threshold Value	Measurable, observable detailed conditions which must be satisfied to determine an EAL applicability.
Thyroid Blocking Agent	An agent which when properly administered to an individual will result in sufficient accumulation of stable iodine in the thyroid to prevent significant uptake of radioiodine. Potassium Iodide is such an agent.
Total Effective Dose Equivalent (TEDE)	The sum of the deep dose equivalent (for external exposure) and the committed effective dose equivalent (for internal exposure) and 4 days of deposition exposure.
Unrestricted Area	Any area to which access is not controlled by the licensee for protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.
Vital Areas	Areas within the station security fence which contain vital equipment. Examples include Control Rooms, Reactor Buildings, Turbine Buildings and Electrical Equipment Rooms.
Vital Equipment	Any equipment, system, device or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems which would be required to function to protect public health and safety following such failure, destruction, or release are also considered to be vital.
Weekly	Frequency occurrence equal to once per calendar week: Monday through Sunday.

Any abbreviation followed by a lower case 's' denotes the plural form of the term.

ACRONYMS

ac ..... alternating current

ALARA ..... as low as reasonably achievable

ANI ..... American Nuclear Insurers

ANS ..... Alert and Notification System

ANSI ..... American National Standards Institute

ARM ..... Area Radiation Monitor

ASLB ..... Atomic Safety Licensing Board

CB ..... citizen band

cc ..... cubic centimeter

CDE ..... Committed Dose Equivalent

CEOC ..... County Emergency Operation Center

CFR ..... Code of Federal Regulations

cm2 ..... square centimeter

CNO ..... Chief Nuclear Officer

cpm ..... count per minute

CR ..... Control Room

CRO ..... Control Room Operator

CRT ..... Cathode Ray Tube

Cs ..... Cesium

dc ..... direct current

DEP ..... Drill and Exercise Performance

DEQ ..... Department of Environmental Quality

DFO ..... Disaster Field Office

DGI ..... Digital Graphics Incorporated

DHFS ..... Department of Health and Family Services

DLR .....Dosimeter of Legal Record

DOE ..... U. S. Department of Energy

DOT.....U. S. Department of Transportation

DPH.....Department of Public Health

dpm ..... disintegration per minute

DQAP ..... Decommissioning Quality Assurance Program

EAL .....Emergency Action Level

EAS ..... Emergency Alerting System

EMA ..... Emergency Management Agency

ENC.....Emergency News Center

ENS..... Emergency Notification System (NRC)

EOC .....Emergency Operations (or Operating) Center

EOF.....Emergency Operations Facility

EOP.....Emergency Operating Procedure

EPA..... U. S. Environmental Protection Agency

EPDS ..... Emergency Preparedness Data System

EPZ ..... Emergency Planning Zone

ERF.....Emergency Response Facility

ESF .....Engineered Safety Feature

FEMA ..... Federal Emergency Management Agency

FRMAC .....Federal Radiological Monitoring and Assessment Center

FRMAP..... Federal Radiological Monitoring and Assessment Plan

FRPCC.....Federal Radiological Preparedness Coordinating Committee

FSAR..... Final Safety Analysis Report

Ge .....Germanium

GET.....General Employee Training

GM ..... Geiger Mueller (radiation detection tube)

HEPA ..... high efficiency particulate air

HPN..... Health Physics Network (NRC)

hr ..... hour

I .....Iodine

IEMA .....Illinois Emergency Management Agency

IRAP.....Interagency Radiological Assistance Plan

JIC..... Joint Information Center

LGEOC.....Local Government Emergency Operations Center

Li .....Lithium

LPZ.....Low Population Zone

MAELU..... Mutual Atomic Energy Liability Underwriters

MCP .....Municipal Command Post

mR..... milliroentgen

NARS .....Nuclear Accident Reporting System

NCRP ..... National Council on Radiation Protection

NOP ..... Nuclear Organization Procedure

NRC .....U. S. Nuclear Regulatory Commission

NRF..... National Response Framework

NRR ..... Nuclear Reactor Regulation (NRC)

NWS.....National Weather Service

NSRAC.....Nuclear Safety Review and Audit Committee

OSC .....Operations Support Center

PAG.....Protective Action Guide

PANS .....Prompt Alert and Notification System

PAR..... Protective Action Recommendation

R..... roentgen

RAA.....Remote Assembly Area (off-site)

RAC.....Regional Advisory Committee (FEMA)

RAFT.....Radiological Assistance Field Team (ILLINOIS)

RAP..... Radiological Assistance Plan (ILLINOIS)

REAC .....Radiological Emergency Assessment Center (ILLINOIS)

REP.....Radiological Emergency Preparedness

RERP .....Radiological Emergency Response Plan

RMS .....Radiation Monitoring System

SCBA ..... Self Contained Breathing Apparatus

SEOC.....State Emergency Operations Center

SFCP..... State Forward Command Post

SPCC ..... Spill Prevention Control and Countermeasure

SPDS .....Safety Parameter Display System

Sr.....Strontium

SRC.....State Radiological Coordinator

SSC..... State Staging Center

TDD.....Telecommunications Device for the Deaf

TEDE.....Total Effective Dose Equivalent

TSC.....Technical Support Center

µCi.....microcurie

UFSAR.....Updated Final Safety Analysis Report

WEM .....Wisconsin Emergency Management

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Command and Control • 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.	(1) Shift Emergency Director	(1) Station Emergency Director	Not applicable	(1) Corporate Emergency Director
Communications[3] • Communicate EAL and PAR classifications to offsite response organizations (OROs), including the NRC, until relieved.	Shift Communicator[1]	(1) ENS Communicator (TSC)	Not applicable	(1) State / Local Communicator
Radiation Protection • 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.	(1) Radiation Protection Personnel	(2) Additional Radiation Protection Personnel *[In addition to personnel on-shift]* (OSC)	As needed	Not applicable

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Emergency Classifications • Evaluate plant conditions and recommend emergency classifications, until relieved.	Not applicable	(1) Operations Manager (TSC)	Not applicable	Not applicable
Engineering • Provide engineering coverage until relieved.	Not applicable	(1) TSC Engineer: Provide engineering coverage for the ERO Additional Staff as Needed	As needed	Not applicable
Security	Security staffing per the site-specific security plan.	(1) **Security Coordinator (TSC)** • Coordinate security- related activities and information with the Emergency Coordinator.	Not applicable	Not applicable

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Repair Team Activities	Not applicable	**Maintenance Personnel (OSC)** • (1) Electrical Maintenance Technician: Provide electrical support for event mitigation and equipment repair. • (1) Mechanical Maintenance Technician: Provide mechanical support for event mitigation and equipment repair.	**Maintenance Personnel (OSC)** • (1) I&C Technician: Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable. Additional I&C staff may be called out if needed. • Electrical Maintenance Technicians – As needed. • Mechanical Maintenance Technicians – As needed.	Not applicable
Supervision of Repair Team Activities	Not applicable	(1) **OSC Director** • Supervise OSC activities as directed by Emergency Coordinator.	**OSC Supervisor(s)** • As needed**(1) Radiation Protection Supervisor / Lead**[1]: Supervise OSC activities related to radiation protection.	Not applicable

Appendix 5

Table 5-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

Emergency Preparedness (EP) Functions	On-Shift	TSC / OSC		EOF - Alert or Greater Augment w/in 60 min.
		Alert or Greater Augment w/in 60 min.	Alert or Greater Augment w/in 90 min.	
Field Monitoring Teams (FMTs)	Not applicable	**Onsite FM Individual** • (1) RP Personnel to assess the protected area for radiation and contamination and provide input to the TSC RPM. Responsible for radiation protection coverage for the FMT as directed by TSC RPM or EOF RPM. . **Offsite FMT A** • (1) Qualified individual to assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM. • (1) Driver to provide transportation.	**Offsite FMT B** • (1) Qualified individual to assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM. • (1) Driver to provide transportation.	Not applicable

Attachment 3D

Byron Station

PROPOSED REVISION TO SITE EMERGENCY PLAN

Exhibit D
Radiological Emergency Plan Annex for Byron Station
(Procedure EP-AA-1002)
(Clean Pages)

EXELON NUCLEAR

RADIOLOGICAL EMERGENCY PLAN ANNEX FOR BYRON STATION

Section 1: Introduction

As required in the conditions set forth by the Nuclear Regulatory Commission (NRC) for the operating license for the Byron Station, the management of Exelon recognizes its responsibility and authority to operate and maintain the nuclear power stations in such a manner as to provide for the safety of the general public.

The Byron Emergency Preparedness Program consists of EP-BY-1000, the Byron Radiological Emergency Plan (E-Plan), EP-AA-1002, Radiological Emergency Plan Annex for Byron Station, Exelon emergency plan implementing procedures, and associated program administrative documents. The Byron Station Radiological Emergency Plan outlines the basis for response actions that would be implemented in an emergency.

This document serves as the Byron Station Emergency Plan Annex and contains information and guidance that is unique to the station. This includes facility geography location for a full understanding and representation of the station's emergency response capabilities. The Station Annex is subject to the same review and audit requirements as the Byron Radiological Emergency Plan.

1.1 Facility Description

The Byron Station, Units 1 and 2, are located in Northern Illinois, approximately 3.7 miles south-southwest of the City of Byron in Ogle County. This site is situated near the center of the county in a predominantly agricultural area. At its closest approach, the Rock River is approximately 1.5 miles west of the western site boundary and 2.2 miles west-southwest of the actual plant location. Byron Station occupies approximately 1288 acres of land. The station site is somewhat rectangular in shape, with the plant structures occupying the southeast portion of the site. The units are permanently defueled.

Figure 1-1 shows the general location of Byron Station. More specific information on station siting may be found in the Updated Final Safety Analysis Report (UFSAR).

The plant consisted of two identical pressurized water reactor (PWR) nuclear steam supply systems (NSSS) and turbine generators furnished by Westinghouse Electric Corporation. Each nuclear steam supply system was designed for a power output of 3645 MWt. Cooling for the plant is provided by mechanical draft cooling towers for essential service cooling water.

1.2 Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) for Byron Station is an area surrounding the station with a radius of about ten miles. (Exact boundaries are determined by the State of Illinois). Refer to Figure 1-1.

The ingestion pathway EPZ for Byron Station is an area surrounding the station with a radius of about 50 miles.

Section 4: Emergency Measures

Byron emergency response actions are covered by Section E of the Byron Radiological Emergency Plan.

4.1 Notification of the Emergency Organization

The Emergency Director is responsible for notifying the State of Illinois Emergency Management Agency (IEMA) via NARS. Ogle County will also be notified via NARS; however, IEMA will maintain responsibility of county notification. If a General Emergency is the initiating event, the Emergency Director is also responsible for notifying the following offsite agencies:

- Ogle County

4.2 Assessment Actions

Throughout each emergency situation, continuing assessment will occur. Assessment actions at Byron Station may include an evaluation of plant conditions; in plant, onsite, and initial offsite radiological measurements; and initial estimates of offsite doses.

4.3 Protective Actions for the Offsite Public

Protective actions concerning the public within the 10-mile EPZ involve prompt notification, evacuation and sheltering. Prompt notification involves the use of the permanently installed outdoor notification sirens located within the EPZ
To aid the Emergency Response Organization during a developing emergency situation, EP-AA-111, "Emergency Classification and Protective Action Recommendations" has been developed based on Section J.10.m of the Byron Radiological Emergency Plan.

4.3.1 Alert and Notification System (ANS) Sirens

The ANS consists of a permanently installed outdoor notification system within a ten-mile radius around the station. The ten-mile radius around the station is primarily an agricultural area with a population density below 2000 persons per square mile. The ANS as installed consists of mechanical and electronic sirens that will cover this entire area with a minimum sound level of 60 db. Additionally, the ANS will cover the heavily populated areas within the ten-mile radius around the station with a minimum sound level of 70 dB to ensure complete coverage.

Once the public has tuned to designated radio stations in an emergency, detailed instructional messages will be given to the public. State and local procedures provide for these messages.

Backup means of notification is achieved through Route Alerting, which is contained within the State and respective counties' Radiological Emergency Response Plans and procedures. The means consists of utilizing vehicles with public address (PA) systems in the event the primary method of alerting and notification is unavailable. The backup method has the capability to alert and notify the public within the plume exposure pathway EPZ within a reasonable time, but does not need to meet the 15-minute design objective for the primary

contractor. These data are used to generate wind roses and to provide estimates of airborne concentrations of gaseous effluents.

5.2.1.1 Instrumentation

The meteorological tower is instrumented with equipment that conforms with the recommendations of Regulatory Guide 1.23 and ANSI/ANS 2.5 (1984). The equipment is placed on booms oriented into the generally prevailing wind at the site. Equipment signals are brought to an instrument shack with controlled environmental conditions. The shack at the base of the tower houses the recording equipment, signal conditioners, etc., used to process and re-transmit the data to the end point users.

5.2.1.2 Meteorological Measurement Program During a Disaster

Cooperation between the corporate office and the meteorological contract assures that a timely restoration of any outage can be made. Emergency field visits to the site are made as quickly as possible after detection of a failure.

Should a disaster of sufficient magnitude occur to destroy the tower structure, a contract is maintained to have a temporary tower erected within 72 hours, weather conditions permitting. Further, the meteorological contractor maintains two levels of sensors (wind speed, wind direction and temperature) in a state of readiness for use on the temporary tower.

Additionally, Exelon Nuclear's existing instrumented towers at other nuclear sites provide a high-density measurement network with multiple backup opportunities.

Meteorological data are available to the station Control Room, Technical Support Center, and Emergency Operations Facility for use in the Dose Projection Computer Model for estimating the environmental impact of unplanned releases of radioactivity from the station.

5.2.2 Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area radiation monitoring system; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and is described in the following subsections.

5.2.2.1 Radiation Monitoring System

Chapters 11 and 12 of the Byron UFSAR describe the radiation monitoring system (RMS) in detail. The installed RMS is designed to continuously monitor plant effluents, and various inplant locations.

5.2.2.3 Radioiodine and Particulate Effluent Monitoring

The General Atomic Company wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which utilizes a gamma spectrometer system detector. In addition, silver zeolite cartridges are available to further reduce the interference of noble gases.

5.2.2.4 Deleted

5.2.2.5 In-plant Iodine Instrumentation

Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using silver zeolite as a sample media. Auxiliary counting room locations have been identified within the Turbine Building. It is expected that a sample can be obtained and analyzed for iodine content within a two-hour time frame.

5.2.3 Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status and is described in the Byron UFSAR. The operability of the post-accident instrumentation ensures information is available on selected plant parameters to monitor and assess important variables following an accident. Instrumentation is available to monitor the parameters and ranges given in Technical Specifications.

5.2.4 Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) Standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble. In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

5.2.5 Facilities and Equipment for Offsite Monitoring

Consult Chapter 11 of the station specific Offsite Dose Calculation Manual (ODCM) for the most current location for fixed continuous air samplers and DLR locations. Byron Station maintains a supply of emergency equipment and supplies for offsite monitoring and sampling by environmental field teams.

5.2.6 Site Hydrological Characteristics

The hydrological characteristics of the Byron Station vicinity are described in the Byron UFSAR. The river screen house is the only structure that could be affected by flooding on the Rock River and is designed for a combined event flood, where a combined event flood is defined as a flood on the Rock River having a 1×10^{-6} annual probability of being exceeded at a 90% confidence level. All other Byron Station structures are 161 feet or more above the Probable Maximum Flood level of the Rock River.

The minimum design operating level of the essential service water makeup pumps is 3.8 feet lower than the water level for the 1-day 100-year low flow drought condition. In the unlikely event that emergency make-up water requirements cannot be satisfied by surface water withdrawals from the Rock River, groundwater wells will serve for makeup to the essential service water cooling towers.

Because of the site hydrological characteristics given above, plant operation should not be affected by Rock River water level conditions and therefore, hydrological monitors have not been installed. The Rock River is not used for any public water supply. There are no recorded plans for any future public water supply usage from the Rock River. The nearest surface water users downstream from Byron Station are on the Mississippi River over 115 miles away. This allows for sufficient mixing that makes permanently installed hydrological monitors unnecessary. In performing dose calculations from liquid releases, Byron Station uses a historical average river flow value, Fw, as a parameter in the liquid release model.

5.3 Protective Facilities and Equipment

The principal onsite assembly areas for Byron Station are the Machine Shop on the 401-foot elevation of the Service Building and the Unit #1 Turbine Building track-way. These areas are suitable because:

1. They are large open areas suitable for assembling a large number of people in a short time;
2. They can be easily exited if a site evacuation is deemed necessary following an assembly; and
3. They have a low probability of being affected by a serious radiological accident.

The offsite relocation centers for Byron Station are discussed in Section 4 of this annex. These locations are suitable, depending on the emergency condition. These locations are owned by Exelon; thus, personnel, supplies, and communications are readily available.

5.4 First Aid and Medical Facilities

Attachment 4

Byron Station

EMERGENCY RESPONSE ORGANIZATION TASK ANALYSIS

Attachment 4
EMERGENCY RESPONSE ORGANIZATION TASK ANALYSIS

Attachment 4 provides a summary Table of the existing Emergency Response Organization (ERO) positions and their respective Emergency Plan tasks as defined in the Emergency Plan. The duties of the Byron ERO positions being eliminated were reviewed against NUREG-0654, Rev 2 and the Byron Radiological Emergency Plan. Each eliminated ERO position was analyzed to ensure key tasks of the position are retained and performed by other ERO members, and unnecessary tasks were appropriately eliminated. The tasks were also evaluated against the NUREG 0654 Planning Standards to ensure regulatory requirements were maintained.

The table will be used to update and revise Emergency Plan Implementing Procedures (EPIPs) with regard to reassignment and revision of tasks resulting from this analysis.

The Table is arranged in columns as described below:

Facility (Column A) : This column identifies the affected Emergency Response Facility

MCR – Main Control Room,

TSC – Tech Support Center,

OSC – Operations Support Center,

EOF – Emergency Off-site Facility and

JIC – Joint Information Center.

Current ERO Position (Column B): This column identifies the ERO Position title. Each ERO position is also identified with a unique abbreviation for reference throughout the table. For example, MSED is for Main Control Shift Manager (Shift Emergency Director).

Position Eliminated (Column C): This column identifies whether the position is being eliminated as part of this License Amendment Request.

Minimum Staff (Column D): This column identifies those positions that are considered Minimum Staff in the current approved E-Plan (i.e., Yes/No).

NRC PI Key ERO (Column E): This column identifies whether the position is a Key ERO position with respect to the NRC Performance Indicator for ERO performance at the station.

Tasks defined by Station Emergency Plan (Column F): This column identifies the specific position tasks identified in the Emergency Plan. Each task is identified with a unique task ID number for quick reference throughout the table. Those tasks that begin with ‘E ‘are responsibilities assigned per the Emergency plan.

Task Disposition (Eliminated/Reassigned To) (Column G): This column identifies the disposition of those tasks assigned to a deleted ERO position under this License Amendment Request. Each ERO task was evaluated and dispositioned as either Eliminated, Modify, or Reassigned. Tasks that are reassigned designate the ERO member receiving the task. Note that tasks which are assigned to a person who remains on the Byron ERO were not dispositioned.

Justification / Implementing Action (Column H): This column provides a conclusion as to why this change is acceptable. In some cases, for tasks not being reassigned, this column provides an action needed when the change is implemented.

Tasks transferred to this position per this Assessment (Column I): This column identifies tasks which have been transferred to the identified ERO position per this Assessment.

Emergency Plan Section Reference (Column J): This column identifies the section of the Byron Emergency Plan which contains the position tasks/responsibilities. The identified Emergency Plan location refers to the step number in the current Byron Emergency Plan.

ERO STAFFING ASSESSMENT MATRIX

	A	B	C	D	E	F	G	H	I	J
1	**Facilty**	**Current ERO Position**	**Position Eliminated**	**Min Staff**	**NRC PI Key ERO**	**Tasks defined by Station Emergency Plan**	**Task Disposition (Eliminated/ Reassigned To)**	**Justification / Implementing action**	**Tasks transferred to this position per this Assessment**	**E-Plan Section Reference**
2	**MCR**	Shift Manager (Shift Emergency Director) **MSED**	No	Yes	Yes	E-MSED1 - Activate the ERO as deemed appropriate or as procedurally required.				EP-BY-1000, Part II, Section B.5.a.1 & Appendix 5
3						E-MSED2 - Perform duties outlined for the Station Emergency Director. The responsibilities described for the Station Emergency Director applies to either the Shift Emergency Director or the Station Emergency Director depending on which individual is in Command and Control.				
4						~~E-MSED3 - Shutdown the reactor when determined that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection circuit set-points and automatic shutdown does not occur~~.	Eliminate	Reactor operation is not applicable in a permanently defueled condition.		
5						~~E-MSED4 - Ensure a review has been completed to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction.~~	Eliminate	Reactor operation is not applicable in a permanently defueled condition.		
6						~~E-MSED5 - Be present at the plant and provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction.~~	Eliminate	Reactor operation is not applicable in a permanently defueled condition.		
7						E-MSED6 - Adhere to the station Technical Specifications and review routine operating data to assure safe operation.				
8						E-MSED7 - Identify applicable EALs and emergency classifications.				
9						E-MSED8 - Adhere to plant operating procedures and the requirements for their use.				
10						E-MSED9 - Supervise the activities of the Control Room Crew.				
11	**MCR**	Shift RP Techs	No	Yes	No	E-MCRRP1 - The Station Radiation Protection personnel are responsible for the handling and monitoring of radioactive materials.				Appendix 5
12						~~E-MCRRP2 - Perform dose assessments/projections and provide input to applicable PAR decision- maker, until relieved~~.	Re-assigned to Shift Operations	Per the On Shift Staffing Assessment, this task may be performed by available Operations staff as a collateral duty.	Shift Operations	
13	**MCR**	STA	No	Yes	No	~~**E-MCRSTA1 - Evaluate plant conditions and recommend emergency classifications, until relieved.**~~	Eliminate	Evaluation of Plant conditions will performed by the Shift Emergency Director. (Reference E-MSED7)		Appendix 5
14						~~**E-MCRSTA2 - Evaluate reactor conditions.**~~	Eliminate	This task is deleted because the reactor is permanently shutdown and defueled.		
15	**TSC**	Station Emergency Director **TED**	No	Yes	Yes	E-TED1 - Activate the Facility				EP-BY-1000, Part II, Section B.5.a.2 & Appendix 5
16						E-TED2 - Conduct personnel assembly/accountability and evacuation of non essential personnel at Site Area Emergency, General Emergency or as conditions warrant.				
17						E-TED3 - If the emergency involves a hazardous substance and/or oil discharges, ensure that appropiate notifications and response have been made.				
18						E-TED4 - Determine if the OSC is to remain activated at the Alert Classification.				
19						E-TED5 - Event classification				
20						E-TED6 - Emergency exposure controls.				
21						E-TED7 - Protective actions for all onsite personnel.				
22						E-TED8 - Supervision of the Station ERO.				
23						E-TED9 - Inform the Corporate Emergency Director and onsite NRC as to the status of the plant.				
24						E-TED10 - Assist the Corporate Emergency Director in the acquisition of information for the state/local notifications, NRC notifications and offsite agency updates.				
25						E-TED11 - Provide information and recommendations to the Corporate Emergency Director.				

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26						E-TED12 - Implement plans, procedures and schedules to meet emergency response objectives as directed by the Corporate Emergency Director.				
27						E-TED13 - Request from the Corporate ERO any additional material, personnel resources or equipment needed to implement response plans and operations				
28	**TSC**	ENS Communicator **TENS**	No	Yes	No	E-TENS1 - Establish communications with appropriate parties as directed.				EP-BY-1000, Part II, Section B.5.a.3 & Appendix 5
29						E-TENS2 - Transmit information that has been reviewed and/or approved by the responsible Manager or Coordinator.				
30						E-TENS3 - Document time, date and information being transmitted or received on appropriate forms.				
31						E-TENS4 - Record and relay inquiries and the responses to those inquiries.				
32						E-TENS5 - Assist appropriate Managers and Coordinators in maintaining proper records and logs of emergency related activities.				
33						E-TENS6 - Gather, record and post appropriate information.				
34						E-TENS7 - Notify the NRC of changes in event classification and assist in completing the NRC Event Notification Worksheet and responding to NRC inquiries.				
35						E-TENS8 - Provide real time updates of significant changes to plant and system status and responses to NRC inquiries.				
36						E-TENS9 - Maintain continuous communications with the NRC, if requested, via the NRC ENS phone or commercial telephone line.				
37	**TSC**	Operations Manager **TOM**	No	Yes	Yes	E-TOM1 - In the event that the Station Emergency Director becomes incapacitated and can no longer fulfill the designated responsibilities, the Operations Manager will normally assume the responsibilities until relieved by another qualified Station Emergency Director				EP-BY-1000, Part II, Section B.5.a.4 & Appendix 5
38						E-TOM2 - Coordinate TSC efforts in determining the nature and extent of emergencies pertaining to equipment and plant facilities in support of Control Room actions.				
39						E-TOM3 - Initiate immediate corrective actions to limit or contain the emergency invoking the provisions of 10 CFR 50.54(x) if appropriate				
40						E-TOM4 - Recommend equipment operations checks and miscellaneous actions to the Control Room in support of restoration and accident mitigation.				
41						E-TOM5 - Approve emergency special procedures, and implement as required under the provisions of 10 CFR 50.54(x).				
42						E-TOM6 - Assist in determining the priority assigned to OSC activities.				
43						E-TOM7 - Organize and direct medical response efforts for injured personnel.				
44						E-TOM8 - Ensure adequate staffing of the Control Room and TSC subordinates.				
45						E-TOM9 - Ensure the Shift Manager is informed of OSC staffing utilization and activities.				
46						E-TOM10 - Identify steps or procedures that the Operations staff should be utilizing to properly respond to the emergency condition.				
47						E-TOM11 - Assist the Station Emergency Director in evaluating changes in event classification.				
48						E-TOM12 - Supervise the activities of the-ENS Communicator in the TSC.				
49						E-TOM13 - Act as the TSC liaison with the appropriate NRC Site Team Representative.				
50						E-TOM14 - Apprise the TSC and EOF staff of the overall plant condition and significant changes to system and equipment status.				

ERO STAFFING ASSESSMENT MATRIX

	A	B	C	D	E	F	G	H	I	J
1	**Facilty**	**Current ERO Position**	**Position Eliminated**	**Min Staff**	**NRC PI Key ERO**	**Tasks defined by Station Emergency Plan**	**Task Disposition (Eliminated/ Reassigned To)**	**Justification / Implementing action**	**Tasks transferred to this position per this Assessment**	**E-Plan Section Reference**
51	**TSC**	Core Thermal Engineer **TCTE**	Yes	Yes	Yes	~~E-TCTE1 - Evaluate reactor conditions.~~	Eliminate	Core assessment and the associated Engineering support not required after fuel removed from reactor vessel.		N/A
52						~~E-TCTE2 - Serves as Core Damage Assessment Methodology (CDAM) Evaluator~~	Eliminate	Core assessment and the associated Engineering support not required after fuel removed from reactor vessel.		
53	**TSC**	Mechanical Engineer **TME**	Yes	Yes	No	~~E-TME1 - Provide engineering coverage for the ERO related to mechanical equipment.~~	Re-assigned to new TSC Engineer Position	Re-assign task to TSC Engineer	TEN - TSC Engineer	N/A
54	**TSC**	Electrical Engineer **TEE**	Yes	Yes	No	~~E-TEE1 - Provide engineering coverage for the ERO related to electrical or I&C equipment~~	Re-assigned to new TSC Engineer Position	Re-assign task to TSC Engineer	TEN - TSC Engineer	
55	**TSC**	TSC Engineer **TEN**	New Position	Yes	No	E-TEN1 Provide engineering coverage for the ERO	From TME and TEE	Reassigned tasks from Mechanical and Electrical Engineers	E-TME1 & TEE1 - Provide engineering coverage for the ERO	N/A
56	**TSC**	TSC Radiation Protection Manager **TRPM**	No	Yes	Yes	E-TRPM1 - Accumulate, tabulate and evaluate data on plant conditions such as meteorological and radiological monitoring readings, and other pertinent data.				EP-BY-1000, Part II, Section B.5.a.6 & Appendix 5
57						E-TRPM2 - Act as the TSC liaison with the appropriate NRC Site Team representative.				
58						E-TRPM3 - Ensure use of protective clothing, respiratory protection, and access control within the plant as deemed appropriate to control personnel exposures.				
59						E-TRPM4 - Ensure that appropriate bioassay procedures have been implemented for onsite personnel when a radioactivity incident has occurred.				
60						E-TRPM5 - Ensure that personnel are decontaminated, if necessary.				
61						E-TRPM6 - Authorize personnel exposures below 5 Rem TEDE (EPA-400 lower limit).				
62						E-TRPM7 - Assist the Station Emergency Director in determining if exposures in excess of the 5 Rem TEDE (EPA-400 lower limit) are necessary.				
63						E-TRPM8 - Advise the Station Emergency Director of situations when the use of KI should be considered.				
64						E-TRPM9 - Advise the Station Emergency Director and EOF Radiation Protection Manager of changes in radiological release status.				
65						E-TRPM10 - Assist the Operations Manager in planning rescue operations and provide monitoring services as required, including the transfer of injured and/or contaminated personnel.				
66						E-TRPM11 - Coordinate with the Security Coordinator to determine the routes to be used for evacuation of non-essential personnel.				
67						E-TRPM12 - Assure additional radiation protection personnel and/or equipment is arranged for, as necessary.				
68	**TSC**	Security Coordinator **TSEC**	No	No	No	E-TSEC1 - Maintain plant security and account for all personnel within the protected area.				EP-BY-1000, Part II, Section B.5.a.7 & Appendix 5
69						E-TSEC2 - Assist the Station Emergency Director in evaluating changes in security related threats and event classifications.				
70						E-TSEC3 - Identify any non-routine security procedures and/or contingencies that are in effect or that require a response.				
71						E-TSEC4 - Expedite ingress and egress of emergency response personnel.				

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72						E-TSEC5 - Coordinate with the Radiation Protection Manager in controlling ingress and egress to and from the Protected Area if radiological concerns are present.				
73						E-TSEC6 - Provide for access control to the Control Room, TSC and OSC, as appropriate.				
74						E-TSEC7 - Expedite entry into the Protected Area, as necessary, for the NRC Site Team.				
75						E-TSEC8 - Act as the TSC liaison with the appropriate NRC Site Team representative.				
76						E-TSEC9 - Assist the Radiation Protection Manager in determining personnel evacuation routes as necessary.				
77						E-TSEC10 - Coordinate the evacuation of station non-essential personnel with the appropriate Local Law Enforcement Agencies (LLEAs).				
78						E-TSEC11 - Coordinate security- related activities and information with the Emergency Coordinator.				
79	**OSC**	Offsite Field Monitoring Teams (2 persons each)	No	Yes	No	E-OSCFMT1 - Assess the area(s) outside the protected area for radiation and contamination, and for radioactive plume tracking, as directed by, and under the control of, the EOF DAC or RPM. Responsible for the radiation protection coverage of the FMT as directed by EOF RPM.				Appendix 5
80						E-OSCFMT2 - Driver to provide transportation.				
81	**OSC**	OSC Director **ODIR**	No	Yes	Yes	E-ODIR1 - Assign tasks as available:(I&C Maint, Mech Maint, Electrical Maint, Rad Protection)	Task Revised	Revised task to recognize removal of some OSC Leads		EP-BY-1000, Part II, Section B.5.a.8 & Appendix 5
82						E-ODIR2 - Coordinate with Operations in the dispatch of Operations personnel to support Control Room and OSC Team activities				
83						E-ODIR3 - Notify the Control Room and TSC prior to dispatch of any OSC teams into the plant.				
84						E-ODIR4 - Maintain OSC resources including personnel, material, and equipment.				
85						E-ODIR5 - Maintain accountability for all individuals dispatched from the OSC.				
86						E-ODIR6 - Conduct periodic briefings on the overall plant status, emergency response activities, and station priorities.				
87						E-ODIR7 - Assemble and dispatch the Field Monitoring Teams as required.				
88						E-ODIR8 - Supervise OSC activities as directed by Emergency Coordinator.				
89	**OSC**	I&C Tech (1)	No	Yes	No	E-OSCIC1 - Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable				EP-BY-1000, Part II, Section B.5.a.9 & App 5
90	**OSC**	Electrical Tech (1)	No	Yes	No	E-OSCEM1 - Provide electrical support for ECCS equipment, event mitigation, and equipment repair.				EP-BY-1000, Part II, Section B.5.a.9 & App 5
91	**OSC**	Mechanical Tech (1)	No	Yes	No	E-OSCMM1- Provide mechanical support for ECCS equipment, event mitigation, and equipment repair.				EP-BY-1000, Part II, Section B.5.a.9 & App 5
92	**OSC**	I&C Supervisor/Lead	Yes	Yes	No	~~E-OSCICGL1 - Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor.~~	Eliminate	The need for a Group Lead/Supervisor is no longer needed initially due to the smaller response. The Techs will be managed by the OSC Director. Leads will be supplemented if necessary.		N/A
93	**OSC**	Electrical Supervisor/Lead	Yes	Yes	No	~~E-OSCEMGL1 - Supervise OSC activities related to electrical equipment.~~	Eliminate	The need for a Group Lead/Supervisor is no longer needed initially due to the smaller response. The Techs will be managed by the OSC Director. Leads will be supplemented if necessary.		N/A

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94	**OSC**	Mechanical Supervisor/Lead	Yes	Yes	No	~~E-OSCMMGL1 - Supervise OSC activities related to mechanical equipment.~~	Eliminate	The need for a Group Lead/Supervisor is no longer needed initially due to the smaller response. The Techs will be managed by the OSC Director. Leads will be supplemented if necessary.		N/A
95	**OSC**	RP Supervisor/Lead	No	Yes	No	E-OSCRPGL1 - Supervise OSC activities related to radiation protection.	Maintan as collateral duty	The duties for oversight of the RP OSC staff wlll be taken as a collateral function for a RP Technician.		EP-BY-1000, Part II, Section B.5.a.9 & Appendix 5
96	**OSC**	Onsite Field Team	No	Yes	No	E-OSCRPOS1 - ~~Qualified Individual~~ **RP Personnel** to assess the protected area for radiation and contamination and provide input to the TSC RPM. Responsible for radiation protection coverage for the FMT as directed by TSC RPM or EOF RPM.	Revised	Task was revised to recognize performance by RP Personnel rather than Qualified Individuals.		Appendix 5
97	**OSC**	Radiation Protection Tech (6)	Reduced	Yes	No	E-OSCRPT1 - Provide qualified radiation protection coverage for responders accessing potentially unknown radiological environments during emergency conditions.		The proposed OSC staff is revised to (2) RP personnel. While no responsibilities are deleted, the response in a permanently shutdown condition is limited when compared to an operating reactor. See Attachment 1 of the LAR for discussion.		EP-BY-1000, Part II, Section B.5.a.9 & Appendix 5
98						E-OSCRPT2 - Provide in-plant surveys.		The proposed OSC staff is revised to (2) RP personnel. While no responsibilities are deleted, the response in a permanently shutdown condition is limited when compared to an operating reactor. See Attachment 1 of the LAR for discussion.		
99						E-OSCRPT3 - Control dosimetry and radiologically controlled area access.		The proposed OSC staff is revised to (2) RP personnel. While no responsibilities are deleted, the response in a permanently shutdown condition is limited when compared to an operating reactor. See Attachment 1 of the LAR for discussion.		
100	**EOF**	Corporate Emergency Director **EED**	No	Yes	Yes	E-EED1 - Coordinate all Exelon Nuclear activities involved with the emergency response.				EP-BY-1000, Part II, Section B.5.b.1 & Appendix 5
101						E-EED2 - Ensure off-site agency updates are periodically communicated as required/requested.				
102						E-EED3 -Coordinate Exelon Nuclear press releases with the Nuclear Duty Officer and Exelon Communications and Public Affairs.				
103						E-EED4 - Request assistance from non Exelon Nuclear emergency response organizations, as necessary.				
104						E-EED5 - Following assumption of Command and Control, Assumes overall Command and Control of emergency response activities and the non-delegable responsibilities for PAR determination and the notification of offsite authorities.				
105						E-EED6 - Following assumption of Command and Control, Ensure that Federal, state and local authorities and industry support agencies remain cognizant of the status of the emergency situation. If requested, dispatch informed individuals to offsite governmental Emergency Operation Centers (EOCs).				
106						E-EED7 - Following assumption of Command and Control, Approve the technical content of Exelon Nuclear press releases prior to their being released to the media.				
107	**EOF**	EOF Radiation Protection Manager **ERPM**	No	Yes	Yes	E-ERPM1 - Recommend changes in event classification and PARs based upon effluent releases or dose projections.				EP-BY-1000, Part II, Section B.5.b.2 & Appendix 5
108						E-ERPM2 - Assist the Emergency Director in the evaluation of the significance of an emergency with respect to the public.				
109						E-ERPM3 - Notify the Emergency Director of meteorological changes that may impact identification of downwind areas.				
110						E-ERPM4 - Advise the Corporate Emergency Director of protective actions taken by the station for plant personnel.				

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111						E-ERPM5 - Assist the TSC in the planning and coordination of activities associated with the evacuation of non-essential personnel.				
112						E-ERPM6 - Advise the Corporate Emergency Director on the need for emergency exposures or for issuance of KI to the Field Monitoring Teams or Exelon personnel required to enter the plume.				
113						E-ERPM7 - Determine the need for and contact Occupational Health/Industrial Safety Services personnel for assistance.				
114						E-ERPM8 - Monitor plant radiological conditions and advise the TSC Radiation Protection Manager of any adverse trends or potential release pathways that may impact existing event classification.				
115						E-ERPM9 - Assist in the completion and review of the state/local notification form.				
116						E-ERPM10 - Maintain cognizance of environmental sampling activities.				
117						E-ERPM11 - Ensure state authorities are provided information pertaining to Exelon Field Monitoring Team activities and sample results.				
118						E-ERPM12 - Assist the affected station in planning and coordination of activities associated with the evacuation of non essential personnel.				
119						E-ERPM13 - Assist the affected station in acquisition of additional instrumentation, dosimetry, protective equipment and radiological support personnel.				
120						E-ERPM14 - Assist and interface with the EOF Technical Support Group and the station in the development of plans for plant surveys, sampling, shielding, and special tools in support of waste systems processing and design modification activities.				
121						E-ERPM15 - Upon request, provide in-plant health physics data to Emergency Public Information personnel.				
122						E-ERPM16 - Coordinate Field Monitoring Team activities.				
123						E-ERPM17 - Determine needs of the Dose Assessment Coordinator and the ENS Communicator for updates on Field Monitoring Team data and ensure distribution of new data to them in accordance with those needs.				
124						E-ERPM18 - Promptly report new environmental or Field Monitoring Team exposure data to the Dose Assessment Coordinator.				
125						E-ERPM19 - Evaluate and assess plant and offsite radiological data in the development of onsite protective actions and offsite PARs, until relieved				
126						E-ERPM20 - Recommend onsite protective actions and offsite PARs to the applicable decision- maker, until relieved.				
127						E-ERPM21 - Direct all radiation protection activities, including field monitoring team (FMT) direction, until relieved.				
128						E-ERPM22 - Provide relevant information to applicable communicators who are communicating offsite PARs to OROs, until relieved.				
129	**EOF**	Dose Assessment Coordinator **EDAC**	No	Yes	No	E-EDAC1 - Interpret radiological data and provide PARs based upon dose projections to the EOF Radiation Protection Manager.				EP-BY-1000, Part II, Section B.5.b.3 & Appendix 5
130						E-EDAC2 - Advise the EOF Radiation Protection Manager of changes in event classification based on effluent releases or dose projections.				
131						E-EDAC3 - Initiate evaluation of the need for administering KI to Exelon nuclear workers				
132						E-EDAC4 - Remain cognizant of forecast and meteorological data and ensure the status is updated periodically.				
133						E-EDAC5 - Notify the EOF Radiation Protection Manager of meteorological changes that may impact identification of downwind areas.				
134						E-EDAC6 - Upon request, provide release and dose assessment data to Emergency Public Information personnel.				
135						E-EDAC7 - Perform dose projections using the Dose Assessment computer models.				

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136						E-EDAC8 - Monitor meteorological and plant effluent conditions.				
137						E-EDAC9 - Evaluate the need for administering KI to Exelon nuclear workers.				
138						E-EDAC10 - Perform dose assessments/projections and provide input to applicable PAR decision- maker, until relieved.				
139	**EOF**	Computer Specialist **ECOMPS**	No	Yes	No	E- ECOMPS1 - Assist any personnel in logging in, initializing or using a desired computer program.				EP-BY-1000, Part II, Section B.5.b.4 & Appendix 5
140						E- ECOMPS2 - Investigate and repair problems encountered with communications equipment and computer equipment/applications.				
141	**EOF**	EOF State/Local Communicator **ESL**	No	Yes	No	E-ESL1 - Communicate and receive information via the Nuclear Accident Reporting System (NARS) circuit or commercial telephone line with appropriate state and county agencies.				EP-BY-1000, Part II, Section B.5.b.5 & Appendix 5
142						E-ESL2 - Prepare state/local notification forms with the assistance of the Corporate Emergency Director.				
143	**JIC**	Corporate Spokesperson **JCSP**	No	Yes	No	E-JCSP1 - Maintain command and control of the Joint Information Center.				EP-BY-1000, Part II, Section B.5.c.1 & Appendix 5
144						E-JCSP2 - Coordinate with Federal, state and local agencies, as well as with other organizations involved in the emergency response, to maintain factual consistency of information to be conveyed to the news media/public.				
145						E-JCSP3 - Conduct periodic briefings with the news media.				
146						E-JCSP4 - Interface with the Public Information Director.				
147						E-JCSP5 - Coordinate and direct responses to media inquiries.				
148						E-JCSP6 - Ensure that the composition and timeliness of Exelon News Releases are adequate.				
149						E-JCSP7 - Provide for timely exchange of information between other spokespersons.				
150	**JIC**	JIC Director **JDIR**	No	Yes	No	E-JDIR1 - Maintain cognizance of conditions of the plant and environment, and the actions of Exelon Nuclear and governmental support personnel.				EP-BY-1000, Part II, Section B.5.c.2 & Appendix 5
151						E-JDIR2 - Coordinate with Federal, state and local agencies, as well as with other organizations involved in the emergency response, to maintain factual consistency of information to be conveyed to the news media/public.				
152						E-JDIR3 - Participate, as needed, in rumor control activities.				
153						E-JDIR4 - Ensure that adequate information flow between the EOF and the JIC is coordinated.				
154						E-JDIR5 - Authorize admittance of non-Exelon Nuclear officials to the JIC.				
155						E-JDIR6 - Until the JIC is fully staffed, work with Corporate Communications to compose draft news releases.				
156						E-JDIR7 - Provide the drafted news releases to the Corporate Emergency Director for technical review prior to Public Information Director approval.				
157						E-JDIR8 - Until the JIC is fully staffed, work with Corporate Communications to ensure that rumors are reviewed, documented and responded to by Exelon Nuclear personnel as deemed appropriate.				
158						E-JDIR9 - Until the JIC is fully staffed, work with Corporate Communications to document and respond to rumors as quickly as possible, through the Exelon Communications and Public Affairs.				
159						E-JDIR10 - Until the JIC is fully staffed, work with Corporate Communications to ensure that the media is being monitored and that Exelon Nuclear personnel review the information detailed or contained in media releases				
160	**JIC**	Public Information Director **JPID**	No	Yes	No	E-JPID1 - Provide the Corporate Emergency Director with an overview of the public and media impacts resulting from the Exelon Nuclear and governmental activities.				EP-BY-1000, Part II, Section B.5.c.3 & Appendix 5

ERO STAFFING ASSESSMENT MATRIX

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161						E-JPID2 - Participate with the Corporate Emergency Director regarding information to be released to the public.				
162						E-JPID3 - Authorize the issuance of news releases.				
163						E-JPID4 - Interface with the Corporate Spokesperson at the JIC.				
164						E-JPID5 - Act as a liaison between the ERO and Exelon Nuclear's corporate executives.				
165						E-JPID6 - Maintain cognizance of conditions of the plant and environment, and the actions of Exelon Nuclear and governmental support personnel.				
166						E-JPID7 - Coordinate information flow between the EOF and the JIC.				
167						E-JPID8 - Review and access media coverage of the emergency event.				

Attachment 5

Byron Station

SUMMARY OF REGULATORY COMMITMENTS

Attachment 5
SUMMARY OF REGULATORY COMMITMENTS

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAMMATIC (YES/NO)
Byron will perform a drill to confirm the ability of the post-shutdown ERO to perform the necessary functions of each emergency response facility and to utilize the post-shutdown procedures being developed depicting the revised assignment of duties. State and local response organizations will be offered the opportunity to participate, and the NRC and FEMA will be provided advance notice and the opportunity to observe drill activities. In addition, other training drills will be conducted to train post-shutdown station ERO members.	Prior to implementation of the Post-Shutdown Emergency Plan.	Yes	No

Attachment 6

Byron Station

CORRESPONDENCE WITH THE STATE OF ILLINOIS

ILLINOIS EMERGENCY MANAGEMENT AGENCY

JB Pritzker
Governor

Alicia Tate-Nadeau
Director

October 29, 2020

Christina Nelson
Midwest Emergency Preparedness Manager
Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

Dear Ms. Nelson,

The Illinois Emergency Management Agency has completed its initial review of the License Amendment Request (LAR), *"Proposed Changes to the Byron and Dresden Emergency Plan for Post-Shutdown and Permanently Defueled Condition"*. We appreciate the opportunity to comment on this document.

The objective of our review was to identify any potential impacts to off-site emergency preparedness and response. This review focused on those changes that have the potential to negatively affect the implementation of the Illinois Plan for Radiological Accidents (IPRA) and the health and safety of the public.

During our TEAMS meeting this morning, we raised several questions regarding the proposed amendment. We also requested that Exelon revisit our previous comments from AR Number 02701960. Our questions and previous comments were addressed in an expeditious manner.

Based upon our review of this document and the proposed changes, IEMA does not anticipate submitting concerns to the U.S. Nuclear Regulatory Commission as part of their review process of the above referenced LAR.

Sincerely,

William E Conway

William Conway