



## ILLINOIS EMERGENCY MANAGEMENT AGENCY

**Bruce Rauner**  
Governor

**James K. Joseph**  
Director

November 14, 2016

50-461

Michael P. Gallagher  
Vice President, License Renewal & Decommissioning  
Exelon Generation Company, LLC  
200 Exelon Way  
Kennett Square, PA 19348

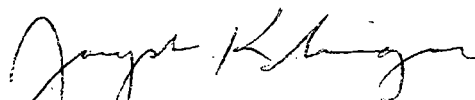
Subject: Response to Comments for the Proposed Changes to the Clinton Power Station Emergency Plan for Permanently Defueled Condition

Dear Mr. Gallagher:

On September 2, 2016, IEMA provided a list of comments from our initial review of the LAR. On October 27, 2016, we received your letter with responses to our questions. We would like to further express our concern with one of the items listed in the Accident Assessment section. Our concern has to do with the source term used to calculate the set point level for RG1/RS1/RA1/RU1. The Exelon response is that "CPS utilizes USAR Table 11.1-1 to define the source term for the EAL set point calculation." This is exactly why we have a concern with this set point. Table 11.1-1 was intended to represent the operating noble gas source term and does not represent the rest of the inventory. The USAR also says that "Fuel fission product inventory information is used in establishing fission product source terms for accident analysis and is therefore discussed in section 15". The choice of using a noble gas source term from Chapter 11 seems inappropriate. Additionally, use of only the noble gases magnifies the problem. Two months after shutdown, the only noble gas left in the source term is Kr-85 and it only accounts for a few percent of the total inventory. It is not clear from the LAR why the other nuclides in the inventory (cesiums and strontiums) are not being considered in the source term.

The agency appreciates the opportunity to comment on this important document. If you have any questions, please feel free to contact Kay Foster at (217) 785-9851 or via e-mail at [Kay.Foster@illinois.gov](mailto:Kay.Foster@illinois.gov) or Ken Evans at 217-785-9912 or via email at [Ken.Evans@illinois.gov](mailto:Ken.Evans@illinois.gov)

Sincerely,

  
Joseph G. Klinger  
Assistant Director

Attachments:

AX45  
NRK

1. Letter from Joseph G. Klinger (Illinois Emergency Management Agency) to Chris Propst (Clinton Power Station, Exelon Generation Company, LLC), "Clinton License Amendment Request," dated September 2, 2016
2. Letter from Michael P. Gallagher (Exelon Generation Company, LLC) to Joseph G Klinger (Illinois Emergency Management Agency)

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



## ILLINOIS EMERGENCY MANAGEMENT AGENCY

**Bruce Rauner**  
Governor

**James K. Joseph**  
Director

September 2, 2016

Chris Propst  
Director, Site Decommissioning Transition Organization  
Clinton Power Station  
Exelon Generation Company, LLC

ATTN: Clinton License Amendment Request

The Illinois Emergency Management Agency has completed its initial review of a draft copy of the Clinton License Amendment Request (LAR), "Proposed Changes to the Clinton Power Station Emergency Plan for Permanently Defueled Condition." IEMA appreciates the opportunity to comment on this document. The objective of our review team was to identify any potential impacts to off-site emergency preparedness and response. This review focused on those changes that have the potential to affect the implementation of the Illinois Plan for Radiological Accidents (IPRA) and, in turn, the health and safety of the public. The review team compiled a list of initial questions on Aug 9, 2016, and received responses from your staff. In addition, representatives from your staff met with the review team on Aug 18, 2016. We appreciate the support your staff has provided in the review process and your consideration of these comments.

### Scope of Credible Scenarios

IEMA is concerned that some of the low probability, high consequence scenarios have been excluded from consideration. If the risk of public exposure exists, then plans should remain in place to address that portion of the population as effectively as possible.

Similarly, the practice of referencing existing guidance and industry precedent is helpful for perspective but does not remove the need for direct technical justification and examination for potential impacts on preparedness. It is clear that the spectrum of possible accidents is reduced once the fuel has been removed from the reactor. Radiological emergency preparedness efforts have been weighted heavily on considerations for operating reactors. It is important to continually challenge our understanding of preparedness with new insights gained from recent events and studies, even for a reduced spectrum of accidents, as we shift a larger portion of our efforts toward decommissioning plans.

A specific example discussed in the Aug 18 meeting was the absence of a seismic event from the list of evaluated scenarios. While we agree that the risk from a seismic event is conceivably low, we feel that this accident should have been used as one of the screening accidents. At a minimum, the seismic event should be specifically addressed with the technical basis for its exclusion.

### Reduced Staffing and Training Drills

Reduction in staffing levels is one of the most significant changes in the plan. Elimination of on-shift and Emergency Response Organization (ERO) positions, with the redistribution of collateral duties amongst

remaining staff, was a concern examined by the review team. IEMA understands that Exelon has performed prescribed staffing analysis according to guidance and industry precedent and analyzed reduced requirements for tasks performed by ERO positions for reassignment to remaining positions. The justification includes discussion of augmenting Technical Support Center (TSC) and Operations Support Center (OSC) staff for specific functions as the need arises for engineering and maintenance functions. As the plan does not include details of the site's overall staffing plan, it is difficult to validate the adequacy of available resources.

The amendment request also credits training and validation drills planned for the April 2017 timeframe as justification of the staffing approach. IEMA looks forward to participating in these drills and believes they will provide an opportunity to evaluate the planned staffing changes for impacts on the interfaces for off-site communications. IEMA feels that participation and feedback from off-site entities should be important components of the determination of the success of the drills.

Of specific concern for ERO staffing was the elimination of the State/Local Communicator position and the resulting possibility for transfer of command and control to the TSC without a position in the facility to perform the State/Local notification function. In the Aug 18 meeting, it was clarified that the eliminated position was a four-hour augmented responder and would potentially be unavailable for the initial response under the current plan. Based on discussion in the meeting, IEMA understands that if command and control was transferred to the TSC prior to the Emergency Operations Facility (EOF) being activated with the remaining State/Local Communicator position, the Operations Manager would be responsible for performing the required notifications. IEMA recommends that this situation be tested in one of the training/validation drills to be conducted in the April 2017 timeframe.

### Spent Fuel Pool Safety Systems

The review team asked for clarification of the extent of designated "Safety Systems" with respect to the change in definition to focus on spent fuel pool cooling. Site approaches to maintenance and operations of safety and non-safety systems were discussed in the Aug 18 meeting. This discussion included both 1) the potential for site requirements to maintain safety equipment to a higher standard of availability and 2) the applicability of "Safety System" designation to Emergency Action Level (EALs) (e.g. CA2, which is proposed for deletion). The Exelon staff indicated that these approaches are still being defined and communicated current systems the site intends to maintain. Exelon agreed to communicate updates as procedures become more defined.

### Accident Assessment

IEMA has reviewed the proposed EALs, which adhere to the guidance of NEI 99-01, Revision 6. One of our concerns continues to be with the RGI/RSI/RAI/ROI series for radiological effluents. We would expect the setpoint levels for these EALs to be lower with a shutdown source term. It was our understanding from the Aug 18 meeting that a contractor will incorporate guidance from NRC EPFAQ 2015-009 in the calculation of new EAL setpoint values that will be in place prior to the effective date of this licensing amendment. However, recent discussions indicate that the Off-site Dose Calculation Manual (ODCM) review will only be on the X/Q and not the source term. This issue is further complicated by several other issues. The calibration factor for the stack monitor is based on a source term from an operating reactor. The average energy of the mix for a reactor that has been shut down is completely different. Additionally, the other EALs that relate to radiological releases depend on spent fuel pool water level and area radiation monitor readings. The water level in the pool is not a control room indication, so that might not be an immediate notification. And similar to the stack monitor calibration factors, the source term could significantly impact the response of the fuel building Area Radiation Monitor (ARMs). These vulnerabilities only add to the importance of establishing appropriate setpoint values for the radiological effluent EALs.

The review team also discussed the elimination of the portion of the plan addressing source term determination. Although the core is no longer intact for traditional core damage assessment, there is still a need to assess the source term if damage were to occur to the assemblies in the spent fuel pool. NUREG-1940, Rascal 4.0,

Description of Models and Methods, section 2.3 was provided as an example of the type of information that could be helpful as a replacement in permanently-defueled plans. In addition, this documentation could be helpful as a supplement to existing plans for spent fuel pool accidents.

#### Other Hazard EALs (Seismic, Winds, Fire, etc.)

Exelon has justified removal of certain EALs by referring to other EALs that would bound them. However, this is a departure from the current defense in depth philosophy, where there are diverse and redundant EALs.

#### RDL Data Requirement

The review team noted that there was no reference to the Reactor Data Link (RDL) in portions of the License Amendment Request (LAR) related to the retirement of Emergency Response Data System (ERDS. Independent of ERDS, 32 IAC 504.10 requires continuation of RDL data until all fuel is removed from the site or the utility is unable to supply the data. It is our understanding from the Aug 18 meeting that a regulatory commitment was created to ensure that the RDL requirement is met. IEMA is in the process of providing additional information to the Clinton staff regarding necessary communications and coordination as available computer points are eliminated by decommissioning modifications.

#### General Comments

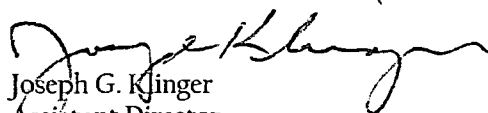
During the course of our review of this LAR, we also identified a number of minor issues that while not a major safety concern, include some information that is either outdated or no longer correct. This list was provided previously and is also attached here.

#### IPRA Review

The Bureau of Nuclear Facility IPRA Section reviewed appropriate portions of the Illinois Plan for Radiological Accidents related to Exelon's proposed changes and identified no additional impacts on the off-site emergency response function.

The agency appreciates the opportunity to comment on this important document. We hope to continue these discussions as the Clinton decommissioning process evolves. If you have any questions, please feel free to contact Kay Foster at (217) 785-9851 or via e-mail at [Kay.Foster@Illinois.gov](mailto:Kay.Foster@Illinois.gov) or Jason Fields at (217) 524-8961 or via email at [Jason.Fields@Illinois.gov](mailto:Jason.Fields@Illinois.gov).

Sincerely,

  
Joseph G. Klinger  
Assistant Director

## Additional Items from IEMA Review of Exelon PDEP LAR Documents

1. Page H-7 of EP-CL-1000, item C deletes the accident or high range radiation monitors. The Mid and High Range effluent monitors at Clinton are part of this system and were added as part of satisfying the NUREG-0737 II.F.1. They are not being deleted and are actually taken credit for in the EALs. Page CL 5-3 of EP-AA-1003 correctly references the Accident Range Stack Monitors whereas EP-AA-1000 does not.
2. On page A-5 of EP-CL-1000 at the top of the page there is the term "IEMA Technical." This term was a replacement for IDNS. Under the current organization, everything here should be combined into "IEMA," as the agency functions as one not two.
3. On page A-9 of EP-CL-1000, Figure A-2 needs to be revised to remove the block for "Dept of Safety/Rad Protection" as IDNS was dissolved in 2003.
4. Page E-4 of EP-CL-1000 references FEMA REP-10 for evaluation of ANS systems. This now outdated reference was replaced by Part V of the FEMA REP Manual, ALERT AND NOTIFICATION SYSTEMS.
5. EP-CL-1000, Appendix 1: References appears to have been overlooked. References 21, 25, 26, 27, 33, 36, 38, and 41 are either obsolete or are not relevant to the Clinton Station. Reference # 26, FEMA REP-14 has been superseded for approximately 15 years. FEMA REP-14 is also referenced on page N-2. The FEMA REP Manual has replaced FEMA REP-14.
6. EP-CL-1000 is the Radiological Emergency Plan for Clinton Station and was separated from the generic Standardized Radiological Emergency Plan. Some sections of the Clinton Plan still include generic language. One example is found at the top of page F-2 in the description of NARS. It states, "The specific design, operation, and responsibility for maintenance of the NARS systems vary between Exelon Nuclear regions." This is just one example where it appears the editors may have overlooked the language.
7. Appendix 3 of EP- CL-1000 lists letters of agreement. Since this plan is a Clinton-only plan, Westinghouse and Provena St. Joseph Medical Center should not need to be listed.
8. Page H-3 of EP-AA-1000 states that the TSC has similar radiological habitability as Control Room personnel. This appears to be a holdover from years ago when the TSC was located in what would have been the Unit 2 Control Room. As the MCR meets GDC 19 criteria and the TSC is located in a butler building with a PF of 5 with HEPA filters but no charcoal, this statement appears to be incorrect.



# Exelon Generation

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RS-16-221

October 27, 2016

Illinois Emergency Management Agency  
ATTN: Joseph G Klinger, Assistant Director  
2200 South Dirksen Parkway  
Springfield, IL 62703

Dewitt County/Canton Emergency Management  
ATTN: Teresa Barnett  
P. O. Box 439  
Clinton, IL 61727

**Subject:** Response to Comments for the Proposed Changes to the Clinton Power Station Emergency Plan for Permanently Defueled Condition

- References:**
1. Letter from Joseph G. Klinger (Illinois Emergency Management Agency) to Chris Propst (Clinton Power Station, Exelon Generation Company, LLC), "Clinton License Amendment Request," dated September 2, 2016
  2. Letter from Teresa Barnett (DeWitt County Emergency Management) to Alan Darelus (Clinton Power Station, Exelon Generation Company, LLC), dated September 1, 2016


On August 11, 2016, Exelon Generation Company, LLC (Exelon) submitted to the U.S. Nuclear Regulatory Commission the License Amendment Request (LAR) for "Proposed Changes to the Clinton Power Station Emergency Plan for Permanently Defueled Condition." Exelon provided a copy of the submittal to the Illinois Emergency Management Agency (IMEA) and DeWitt County Emergency Management for review in preparation to permanently shutdown and decommission the Clinton Power Station (CPS) beginning by June 1, 2017. The purpose of review of the LAR was to identify any potential impacts to the DeWitt County and State of Illinois off-site emergency preparedness and response; specifically, those changes that have the potential to affect the implementation of the Illinois Plan for Radiological Accidents (IPRA).

In letters dated September 2, 2016 (Reference 1) and September 1, 2016 (Reference 2), Exelon was informed that IMEA and DeWitt County completed the initial review of the LAR. The letters provided questions related to the proposed changes to the CPS Emergency Response Organization Staffing and Emergency Action Levels (EALs) discussed in the LAR, as well as additional comments related to the approved CPS Emergency Plan currently in place. Attached to this letter are Exelon's responses to your questions.

October 27, 2016  
Illinois Emergency Management Agency  
DeWitt County Emergency Management  
Page 2

We appreciate your input and look forward to continued discussions as the Clinton decommissioning process evolves. If you have any questions concerning this submittal, please contact Mr. Doug Walker at (610) 765-5952.

Respectfully,

A handwritten signature in black ink, appearing to read "Michael P. Gallagher". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael P. Gallagher  
Vice President, License Renewal & Decommissioning  
Exelon Generation Company, LLC

Attachments: 1. Responses to IMEA and DeWitt County Comments

cc: Illinois Emergency Management Agency – Division of Nuclear Safety



bcc: Project Manager, NRR – Clinton Power Station  
Site Vice President – Clinton Power Station  
Plant Manager – Clinton Power Station  
Director, Operations – Clinton Power Station  
Director, Training – Clinton Power Station  
Director, Site Work Management – Clinton Power Station  
Senior Manager, Decommissioning - KSA  
Director, Licensing and Regulatory Affairs (West)  
Regulatory Assurance Manager – Clinton Power Station  
Director, Site Decommissioning – Clinton Power Station  
Exelon Document Control Desk Licensing (Hard Copy)

**Attachment 1**

**Responses to IEMA AND DeWitt County Comments**

**DeWitt County Comments**

1. **Comment:** After reviewing the CPS Decommissioning document, I have a few topics to address. The first is the altering of the HAB EAL HG1. I question why that category of EAL would be altered so early in the process. I do not perceive that the threat level is significantly lowered as there will still be dangerous quantities of radioactive materials on site for several years. Any plan to use another HAB EAL does not trigger the same response as HG1. After years of having to document and demonstrate redundancy, I find it interesting that "redundancy and unnecessary" are the terms used to explain why the EALs are being deleted. Any HAB event is a Law Enforcement Issue and the response should begin with Law Enforcement at the earliest point of notification. The EOC activation is to support all aspects of the response and protective actions.

**Response:** Exelon agrees with DeWitt County's position regarding the importance of early notification of Law Enforcement. Under the Clinton Emergency Plan, the DeWitt County Sheriff's Department and the DeWitt County EOC will continue to be notified within 15 minutes for any General Emergency Classification.

CPS Security will continue to maintain procedure guidance to immediately contact DeWitt County and coordinate offsite response to any security event.

Clinton is deleting their EAL HG1, "Hostile Action Resulting in loss of Physical Control of the Facility", in response to NRC's position regarding FAQ 2015-013 (ML16084A872). The change is independent of the decommissioning process and is available to all Nuclear sites to consider and revise in accordance with 10CFR 50.90.

The following is the NRC's position regarding FAQ 2015-013 and the deletion of EAL HG1:

*This particular IC, HG1 (from NEI 99-01 Revision 6), was developed as a result of the direction provided in NRC Bulletin 2005-02, "Emergency Preparedness and Response for Security-Based Events," (ADAMS Accession No. ML051740058). This IC was part of a set of recommended EALs to highlight security-related events and the recommended the appropriate emergency classification level (i.e., Unusual Event, Alert, Site Area Emergency, or General Emergency).*

*Since the publication of this Bulletin (July 2005) there has been a significant number of drills and exercises observed and evaluated by the staff, and many of them have had NRC participation (Headquarters and Regions). Many of these were hostile action-based. The overlap and redundancy of EALs, while typically not an issue, and in fact somewhat expected, has led to some confusion for security-based events, particularly when evaluating the impact on public health and safety.*

*The intent of the Bulletin, for this IC, was to declare a General Emergency when a Hostile Action led to a loss of control of plant equipment needed to maintain safety functions:*

- reactivity control,
- core cooling (PWR) / reactor pressure vessel water level (BWR), and
- Reactor Coolant System (RCS) heat removal.

*The basis section also stated that this IC should address a loss of physical control of spent fuel pool cooling systems if imminent fuel damage is likely. There are several ICs that are redundant with this IC, and are better suited to ensure timely and effective emergency declarations. In addition, the development of new spent fuel pool level EALs, as a result of NRC Order EA-12-051, clarified the intended emergency classification level for spent fuel pool level events.*

2. **Comment:** The other topic discussed at the meeting in July was if the county would participate in additional exercises outside the regular exercise schedule. I was told on that date that DeWitt County would not be expected to participate beyond the usual activities of the established exercise cycle. I am in total agreement with this expectation. I do not see any reason why we would be asked to increase our exercise involvement.

**Response:** CPS has committed to perform additional training drills to ensure ERO personnel can adequately perform assigned tasks and functions under the revised Emergency Plan. At least one of these drills will be observed by the NRC and will demonstrate the proficiency of the CPS ERO to implement the revised Emergency Plan. CPS invites IEMA and the local counties to participate in this drill; however, there are no regulatory requirements which mandate participation by IEMA or the local counties. It should be noted, the November 2017 Biennial Graded Exercise will also provide an opportunity for IEMA and the local counties to participate in CPS's Post Shutdown Emergency Plan.

### **IEMA Comments**

The Illinois Emergency Management Agency has completed its initial review of a draft copy of the Clinton License Amendment Request (LAR), "Proposed Changes to the Clinton Power Station Emergency Plan for Permanently Defueled Condition." IEMA appreciates the opportunity to comment on this document. The objective of our review team was to identify any potential impacts to off-site emergency preparedness and response. This review focused on those changes that have the potential to affect the implementation of the Illinois Plan for Radiological Accidents (IPRA) and, in turn, the health and safety of the public. The review team compiled a list of initial questions on Aug 9, 2016, and received responses from your staff. In addition, representatives from your staff met with the review team on Aug 18, 2016. We appreciate the support your staff has provided in the review process and your consideration of these comments.

#### **1. Scope of Credible Scenarios**

- a. **Comment:** IEMA is concerned that some of the low probability, high consequence scenarios have been excluded from consideration. If the risk of public exposure exists, then plans should remain in place to address that portion of the population as effectively as possible.

Similarly, the practice of referencing existing guidance and industry precedent is helpful for perspective but does not remove the need for direct technical justification and examination for potential impacts on preparedness. It is clear that the spectrum of possible accidents is reduced once the fuel has been removed from the reactor. Radiological emergency preparedness efforts have been weighted heavily on considerations for operating reactors. It is important to continually challenge our understanding of preparedness with new insights gained from recent events and studies, even for a reduced spectrum of accidents, as we shift a larger portion of our efforts toward decommissioning plans.

A specific example discussed in the Aug 18 meeting was the absence of a seismic event from the list of evaluated scenarios. While we agree that the risk from a seismic event is conceivably low, we feel that this accident should have been used as one of the screening accidents. At a minimum, the seismic event should be specifically addressed with the technical basis for its exclusion.

**Response:** The EALs applicable to the defueled condition are currently in place and will remain in place, with the exception of HG1 (as previously discussed). The changes being made to the CPS Emergency Plan do not remove low probability, high consequence scenarios from consideration. The LAR only seeks to remove those EALs which are no longer applicable to the defueled condition as identified in the current EAL scheme.

Clinton agrees with IEMA's statement "*the practice of referencing existing guidance and industry precedent is helpful for perspective but does not remove the need for direct technical justification and examination for potential impacts on preparedness*". CPS has provided both the reference to industry precedent as well as justification for the changes being proposed to the Emergency Plan. Attachment 1 of the submitted License Amendment Request discusses major changes to the Emergency Plan and provides

justification with respect to both the Regulatory requirements and the commitments made under the Emergency Plan. In addition, Attachment 2 provides further evaluation and justification of each change made to the Emergency Plan through a comparison of the existing and proposed changes to the Emergency Plan. Attachment 4 assesses changes in On-Shift Staffing and Attachment 5 assesses changes to specific tasks for each ERO member. Finally, Exelon has committed to perform a drill to demonstrate the ERO is proficient in executing the proposed changes to the CPS Emergency Plan prior to implementation.

EALs continue to address seismic events through HU4 (Seismic Event greater than OBE level). The escalation of the Unusual Event to a more significant classification for a seismic event that damages the spent fuel pool will be addressed through the following EALs:

- **RA2**, Significant lowering of water level above, or damage to, irradiated fuel.
- **RS2** Spent fuel pool level at **1.00 ft.** as indicated on 1LI-FC221A(B)
- **RG2** Spent fuel pool level cannot be restored to at least **1.00 ft.** as indicated on 1LIFC221A(B) for 60 minutes or longer.
- **RA1** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.
- **RS1** Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE.
- **RG1** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE.

The seismic event discussed under EAL CA2 (Hazardous event affecting Safety System required for the current operating mode) does not apply to a Defueled Condition under the current EAL scheme and the NRC endorsed industry guidance (NEI 99-01, Rev 6).

## 2. Reduced Staffing and Training Drills

- a. **Comment:** Reduction in staffing levels is one of the most significant changes in the plan. Elimination of on-shift and Emergency Response Organization (ERO) positions, with the redistribution of collateral duties amongst remaining staff, was a concern examined by the review team. IEMA understands that Exelon has performed prescribed staffing analysis according to guidance and industry precedent and analyzed reduced requirements for tasks performed by ERO positions for reassignment to remaining positions. The justification includes discussion of augmenting Technical Support Center (TSC) and Operations Support Center (OSC) staff for specific functions as the need arises for engineering and maintenance functions. As the plan does not include details of the site's overall staffing plan, it is difficult to validate the adequacy of available resources.

**Response:** CPS will maintain sufficient engineering staff and maintenance craft following permanent shutdown to support plant activities and the Emergency Plan. Additionally, CPS will have available the support of a Corporate Engineering staff, as well as engineering and maintenance staff at nearby operating reactor facilities if needed (i.e., LaSalle, Dresden, Braidwood, Byron and Quad Cities).

CPS has developed a Comprehensive Staffing Plan under procedure DC-AA-300-1004 which provides targeted staffing following permanent shutdown. CPS will provide IEMA the proposed staffing tables for the time period this Emergency Plan will be in place.

- b. **Comment:** The amendment request also credits training and validation drills planned for the April 2017 timeframe as justification of the staffing approach. IEMA looks forward to participating in these drills and believes they will provide an opportunity to evaluate the planned staffing changes for impacts on the interfaces for off-site communications. IEMA feels that participation and feedback from off-site entities should be important components of the determination of the success of the drills.

**Response:** Exelon agrees that feedback from the offsite entities should be considered in evaluating the drill performance. The drill will be evaluated using the applicable industry Drill Objectives and Demonstration Criteria. Additionally, comments and feedback from the offsite participants will be encouraged and addressed in CPS corrective action program for resolution.

Regarding the performance of the scheduled drills, CPS will invite IEMA to participate in the NRC observed validation drill. IEMA will also be invited to participate in the post drill critique process. Performance and program issues will be addressed through the station corrective action program prior to implementation of the post shutdown Emergency Plan.

- c. **Comment:** Of specific concern for ERO staffing was the elimination of the State/Local Communicator position and the resulting possibility for transfer of command and control to the TSC without a position in the facility to perform the State/Local notification function. In the Aug 18 meeting, it was clarified that the eliminated position was a four-hour augmented responder and would potentially be unavailable for the initial response under the current plan. Based on discussion in the meeting, IEMA understands that if command and control was transferred to the TSC prior to the Emergency Operations Facility (EOF) being activated with the remaining State/Local Communicator position, the Operations Manager would be responsible for performing the required notifications.

IEMA recommends that this situation be tested in one of the training/validation drills to be conducted in the April 2017 timeframe.

**Response:** The State/local communications function is performed by on-shift Communicator until transferred to the EOF State/local Communicator in conjunction with the CPS Command and Control turnover process. Under CPS's Emergency Plan, the EOF State/local Communicator is designated as a Minimum Staff (1 hour) responder. The TSC State/local Communicator is non minimum augmented staff and is committed to respond within 4 hours. While the TSC position provides redundancy to the State/local communicator position under the current Emergency Plan, CPS has evaluated in the License Amendment that the State/local Communication function will maintain sufficient redundancy with the on-shift Communicator and the EOF State/local Communicator positions. Regarding the elimination of the State/local communicator in the TSC, it should be clarified that CPS does not plan to qualify the Operations Manager at the TSC to perform State/local communications.

### 3. Spent Fuel Pool Safety Systems

- a. **Comment:** The review team asked for clarification of the extent of designated "Safety Systems" with respect to the change in definition to focus on spent fuel pool cooling. Site approaches to maintenance and operations of safety and nonsafety systems were discussed in the Aug 18 meeting. This discussion included both 1) the potential for site requirements to maintain safety equipment to a higher standard of availability and 2) the applicability of "Safety System" designation to Emergency Action Level (EALs) (e.g. CA2, which is proposed for deletion). The Exelon staff indicated that these approaches are still being defined and communicated current systems the site intends to maintain. Exelon agreed to communicate updates as procedures become more defined.

**Response:** The definition of Safety Systems is revised under the proposed emergency plan to delete references to an operating reactor. Under the current Emergency Plan, the definition of SAFETY SYSTEM had references to cooling down the plant and placing the plant in a cold shutdown condition.

**SAFETY SYSTEM:** *A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.*

The definition was revised to remove the operating plant references as follows:

**SAFETY SYSTEM:** *A system required for safe plant operation*

Specific systems applicable to the defueled condition will be shared with IEMA as implementing procedures are developed. CPS understands that there is no obligation to expand the definition of SAFETY SYSTEMS following permanent shutdown to include additional systems under the definition, since the current definition applies to both the operating and defueled conditions.

Note that EAL CA2, "Hazardous Event affecting a SAFETY SYSTEM" is removed from the EAL scheme because it currently is not applicable to a Defueled condition under the CPS Emergency Plan and NEI 99-01 Rev 6. SAFETY SYSTEMs continue to be discussed in EALs HU6 (Hazardous Event) and HU7 (Other conditions exist which in the judgment of the Emergency Director warrant declaration of an UNUSUAL EVENT.)

### 4. Accident Assessment:

- a. **Comment:** IEMA has reviewed the proposed EALs, which adhere to the guidance of NEI 99-01, Revision 6. One of our concerns continues to be with the RG1/RS1/RA1/RU1 series for radiological effluents. We would expect the setpoint levels for these EALs to be lower with a shutdown source term. It was our understanding from the Aug 18 meeting that a contractor will incorporate guidance from NRC EPFAQ 2015 -009 in the calculation of new EAL setpoint values that will be in place prior to the effective date of this licensing amendment. However, recent discussions indicate that the Off-site Dose Calculation Manual (ODCM) review will only be on the X/Q and not the source term. This issue is further complicated by several other issues. The calibration factor for the stack monitor is based on a source term from an operating reactor. The average energy of the mix for a reactor that has been shut down is completely different. Additionally, the other

EALs that relate to radiological releases depend on spent fuel pool water level and area radiation monitor readings. The water level in the pool is not a control room indication, so that might not be an immediate notification. And similar to the stack monitor calibration factors, the source term could significantly impact the response of the fuel building Area Radiation Monitor (ARMs). These vulnerabilities only add to the importance of establishing appropriate setpoint values for the radiological effluent EALs.

**Response:** CPS's EAL thresholds for the RG1/RS1/RA1/RU1 series currently apply to both a Defueled operating mode as well as Operating Modes 1 through 5 under the EAL scheme. The EAL thresholds have been reviewed and approved by the NRC under a Safety Evaluation Report (reference Letter from U.S Nuclear Regulatory Commission to Exelon Generation Company, LLC, "Issuance of Amendments Regarding Emergency Action Level Schemes," dated July 28, 2015, ADAMS Accession No. ML15141A058). CPS utilizes USAR Table 11.1-1 to define the source term for the EAL setpoint calculation.

Under Exelon's processes for revising the ODCM and USAR, Emergency Plan EAL setpoints would be updated to reflect changes to the ODCM for Meteorological data or changes to USAR Chapter 11 source term description.

CPS proposes to maintain the Radiation Series EAL thresholds at the current values which were approved in the NEI 99-01, Revision 6 Safety Evaluation Report until the Post Defueled Emergency Plan is implemented. It is noted that the timeframe in which these EALs are in place is bounded by the implementation of the Permanently Defueled Emergency Plan (coincident with the Zirc fire milestone). At this time, it is anticipated that the General Emergency and the Site Area Emergency (RG1 and RS1) will be removed from the EAL scheme based on anticipated Exemptions from the requirements of 10 CFR 50.47 and Part 50, Appendix E. Industry experience has shown this to occur roughly 14-18 months following shutdown.

With regard to the comment that "the water level in the pool is not a control room indication, so that might not be an immediate notification", CPS does have immediate indication of decreasing Fuel Pool level in the Main Control Room. Main Control Room annunciators provide indication of a lowering Fuel Pool level. Level annunciators monitor Fuel Pool Surge Tank level and provide very early indication of a loss of Fuel Pool inventory. The following Main Control Room annunciators are associated with the Spent Fuel Pool level:

- 5040-2F, Low Level Spent Fuel Stor Pool
- 5040-3F, Low-Low Level Spent Fuel Stor Pool
- 5040-4F, High Flow Spent Fuel Stor Pool Leak Detection
- 5040-4G, High Flow Cask Pool Leak Detection

CPS operators would take immediate actions to monitor Fuel Pool level upon receiving the Main Control Room annunciator. CPS would declare a Site Area (under RA2) or General Emergency (under RG2) prior to achieving the Radiation Series EAL setpoints in RG1 and RS1.



NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" provides additional insight on Spent Fuel Pool accidents and the associated risks. The NRC identified nine initiating event categories to investigate as part of the quantitative assessment on SFP risk:

- Loss of offsite power from plant centered and grid-related events
- Loss of offsite power from events initiated by severe weather
- Internal fire
- Loss of pool cooling
- Loss of coolant inventory
- Seismic event
- Cask drop
- Aircraft impact
- Tornado missile

This list represents an important difference relative to an operating power reactor where typically a large number of different initiating events make significant contributions to risk. NUREG 1738 found that the event sequences important to risk at decommissioning plants are limited to large earthquakes and cask drop events.

Recoverable events such as small loss of inventory or loss of power or pool cooling evolve very slowly where many days are generally available for recovery. A beyond design-basis accident that results in the water draining from the pool (whether a full or partial drain-down) would likely take much longer than 10 hours because of the robust construction of the spent fuel pool and the large volume of water in the pool.

Considering fuel pool cooling will be the principal focus for the on-shift plant staff, the SFP level would be closely monitored and mitigative actions would be timely. EAL classification up through the General Emergency level would likely occur based on SFP level prior to reaching the RG1 Radiation level threshold.

Additionally, the NEI 99-01, Rev. 6 recognizes the effluent monitor setpoints for the Radiation series EALs are relied upon initially, prior to the establishment of Dose Assessment. Once Dose Assessment is established, classification using Dose Assessment and actual meteorology is preferred. NEI 99-01, Rev 6 provides the following insight:

*The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.*

CPS will maintain the ability to perform Dose Assessment using actual meteorology on shift at all times.

- b. **Comment:** The review team also discussed the elimination of the portion of the plan addressing source term determination. Although the core is no longer intact for traditional core damage assessment, there is still a need to assess the source term if damage were to occur to the assemblies in the spent fuel pool. NUREG-1940, Rascal 4.0, Description of Models and Methods, section 2.3 was provided as an example of the

type of information that could be helpful as a replacement in permanently-defueled plans. In addition, this documentation could be helpful as a supplement to existing plans for spent fuel pool accidents.

**Response:** CPS Emergency Plan EP-CL-1000, Section II.I Accident Assessment contains a description of the accident assessment methods available to CPS in emergency conditions. Section I.3 Source Term, provides a description of the Core Damage estimation methods available for CPS. The section was deleted in the CPS Emergency Plan because, in a permanently defueled condition, CPS would no longer have a reactor core and the description in this section no longer applies. Clinton is still capable of providing a source term for fuel in the Spent Fuel Pool through their Dose Assessment tool. The tool utilizes spent fuel pool water level and fuel conditions (i.e., spent fuel pool water drained, fuel damaged underwater, release from a dry storage cask) to determine spent fuel source terms. CPS also maintains the ability utilize effluent sampling and field surveys to identify the source term.

#### 5. Other Hazard EALs (Seismic, Winds, Fire, etc.)

**Comment:** Exelon has justified removal of certain EALs by referring to other EALs that would bound them. However, this is a departure from the current defense in depth philosophy, where there are diverse and redundant EALs.

**Response:** The proposed revision primarily removes those EALs which currently do not apply to a defueled condition under the current NRC approved Emergency Plan for CPS. This includes CA2, Hazardous Event affecting Safety Systems. This is consistent with the designation of these EALs in NEI 99-01, Revision 6. In essence, these EALs would not apply to CPS regardless of the implementation of this proposed revision.

The exception is the proposed removal of HG1, "Hostile Action resulting in loss of physical control of the facility". This EAL is removed in conjunction with an NRC issued FAQ 2015-013 (ML16084A872)

#### 6. RDL Data Requirement

**Comment:** The review team noted that there was no reference to the Reactor Data Link (RDL) in portions of the License Amendment Request (LAR) related to the retirement of Emergency Response Data System (ERDS). Independent of ERDS, 32 IAC 504.10 requires continuation of RDL data until all fuel is removed from the site or the utility is unable to supply the data. It is our understanding from the Aug 18 meeting that a regulatory commitment was created to ensure that the RDL requirement is met. IEMA is in the process of providing additional information to the Clinton staff regarding necessary communications and coordination as available computer points are eliminated by decommissioning modifications.

**Response:** State Regulation 32 IAC 504.10 states:

- c. *This Part provides the criteria and requirements under which each owner of a nuclear power reactor shall transmit to the Agency a System Status Signals Catalogue for the reactor via a Reactor Data Link (RDL).*

- e. *For any nuclear power reactor providing an RDL, the owner shall continue to transmit a System Status Signals Catalogue after the License to Operate is no longer maintained and until such time that all fuel is removed from the site or until the owner no longer possesses the capability to supply such data.*

CPS will continue to provide the required data to the State of Illinois in accordance with the Statute. CPS has created Action Item 2707410 in the Commitment Tracking database to ensure the State Regulation is maintained.

## **7. General Comments**

During the course of our review of this LAR, we also identified a number of minor issues that while not a major safety concern, include some information that is either outdated or no longer correct. This list was provided previously and is also attached here.

### **Bureau of Nuclear Facility IPRA Review**

The Bureau of Nuclear Facility IPRA Section reviewed appropriate portions of the Illinois Plan for Radiological Accidents related to Exelon's proposed changes and identified no additional impacts on the off-site emergency response function.

The agency appreciates the opportunity to comment on this important document. We hope to continue these discussions as the Clinton decommissioning process evolves. If you have any questions, please feel free to contact Kay Foster at (217) 785-9851 or via e-mail at [Kay.Foster@Illinois.gov](mailto:Kay.Foster@Illinois.gov) or Jason Fields at (217) 524-8961 or via email at [Jason.Fields@Illinois.gov](mailto:Jason.Fields@Illinois.gov).

### **Additional Items from IEMA Review of Exelon PDEP LAR Documents**

1. Page H-7 of EP-CL-1000, item C deletes the accident or high range radiation monitors. The Mid and High Range effluent monitors at Clinton are part of this system and were added as part of satisfying the NUREG-0737 11.F.1. They are not being deleted and are actually taken credit for in the EALs. Page CL 5-3 of EP-AA-1003 correctly references the Accident Range Stack Monitors whereas EP-AA-1000 does not.

**Response:** Exelon agrees that the Rad Monitors discussed in the Station Annex on page CL 5-3 of EP-AA-1003 will be maintained as part of the Emergency Plan commitments. Additionally, Effluent Rad Monitors and Area Radiation monitors will continue to be used in conjunction with the station Emergency Action Levels. The revision to EP-CL-1000 was intended to remove reference to the Containment and Drywell High Range Monitors which will no longer be in use at the station.

2. On page A-5 of EP-CL-1000 at the top of the page there is the term "IEMA Technical." This term was a replacement for IONS. Under the current organization, everything here should be combined into "IEMA," as the agency functions as one not two.

**Response:** Exelon agrees with the comment and will update the reference as allowed under 10CFR 50.54(q) upon implementation of the Post Shutdown Emergency Plan. This comment is tracked under Action Tracking Item 2701960.01.

3. On page A-9 of EP-CL-1000, Figure A-2 needs to be revised to remove the block for "Dept of Safety / Rad Protection" as IDNS was dissolved in 2003.

**Response:** Exelon agrees with the comment and will update the reference as allowed under 10CFR 50.54(q) upon implementation of the Post Shutdown Emergency Plan. This comment is tracked under Action Tracking Item 2701960.01

4. Page E-4 of EP-CL-1000 references FEMA REP-10 for evaluation of ANS systems. This now outdated reference was replaced by Part V of the FEMA REP Manual, ALERT AND NOTIFICATION SYSTEMS.

**Response:** Exelon agrees with the comment and will update the reference as allowed under 10CFR 50.54(q) upon implementation of the Post Shutdown Emergency Plan. This comment is tracked under Action Tracking Item 2701960.01

5. EP-CL-1000, Appendix 1: References appears to have been overlooked. References 21, 25, 26, 27, 33, 36, 38, and 41 are either obsolete or are not relevant to the Clinton Station. Reference # 26, FEMA REP-14 has been superseded for approximately 15 years. FEMA REP-14 is also referenced on page N-2. The FEMA REP Manual has replaced FEMA REP-14.

**Response:** Exelon agrees with the comment and will update the reference as allowed under 10CFR 50.54(q) upon implementation of the Post Shutdown Emergency Plan. This comment is tracked under Action Tracking Item 2701960.01

6. EP -CL-1000 is the Radiological Emergency Plan for Clinton Station and was separated from the generic Standardized Radiological Emergency Plan. Some sections of the Clinton Plan still include generic language. One example is found at the top of page F-2 in the description of NARS. It states, "The specific design, operation, and responsibility for maintenance of the NARS systems vary between Exelon Nuclear regions." This is just one example where it appears the editors may have overlooked the language.

**Response:** Exelon agrees with the comment and will update the Emergency Plan as allowed under 10CFR 50.54(q) upon implementation of the Post Shutdown Emergency Plan. This comment is tracked under Action Tracking Item 2701960.01

7. Appendix 3 of EP- CI -1000 lists letters of agreement. Since this plan is a Clinton-only plan, Westinghouse and Provena St. Joseph Medical Center should not need to be listed.

**Response:** Exelon partially agrees with the comment and will update the Emergency Plan as allowed under 10CFR 50.54(q) upon implementation of the Post Shutdown Emergency Plan. The reference to Westinghouse will be removed from the list of Letters of Agreement. The Provena St Joseph Medical Center however, is considered a backup medical facility for Clinton under a Letter of Agreement. This comment is tracked under Action Tracking Item 2701960.01.

8. Page H-3 of EP-AA-1000 states that the TSC has similar radiological habitability as Control Room personnel. This appears to be a holdover from years ago when the TSC was located in what would have been the Unit 2 Control Room. As the MCR meets GDC

19 criteria and the TSC is located in a butler building with a PF of 5 with HEPA filters but no charcoal, this statement appears to be incorrect.

**Response:** Exelon disagrees with the comment. CPS relocated and redesigned their TSC in 2007 to meet the requirements of NUREG 0696 and NUREG 0737. In a letter from the NRC to CPS dated March 07, 2007 (TAC No MD2468), the NRC provided the following evaluation of the TSC habitability:

*The proposed Clinton TSC will be adequately protected from radiological hazards including direct radiation and airborne radioactivity from in-plant sources under accident conditions. The Clinton TSC has been designed to meet the protective envelope requirements similar to the MCR as identified in NUREG-0696 and NUREG -0737. This includes high efficiency particulate air and charcoal filters on the emergency makeup unit, radiation monitoring, and backup power supplies. The occupancy dose rates in the proposed Clinton TSC are the same or less than those of the MCR. Clinton performed a dose calculation and verified that the proposed Clinton TSC meets the criteria outlined in NUREG-0696, including ensuring the dose to the Clinton TSC occupants is limited to less than 5 rem [roentgen equivalent man] total effective dose equivalent for the 30-day accident mitigation period. This meets the function requirements of NUREG-0696 and is acceptable.*