

10 CFR 50.54(q)

RS-09-073

June 19, 2009

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001Clinton Power Station, Unit 1  
Facility Operating License No. NPF-62  
NRC Docket No. 50-461**Subject: Request for NRC Approval of Changes to the Clinton Power Station  
Emergency Plan**

In accordance with 10 CFR 50.54, "Conditions of licenses," paragraph (q), Exelon Generation Company, LLC (EGC) requests NRC approval of a proposed change to the Exelon Nuclear Radiological Emergency Plan Annex for Clinton Station. This proposed change requests a revision to Table B-1, "Minimum Staffing Requirements for the On-Shift Clinton Station ERO," to increase the Non-Licensed Operator staffing from two to four, allow in-plant protective actions to be performed by personnel assigned other functions, and replace a Mechanical Maintenance person with a Non-Licensed Operator. The purpose of this submittal is to provide justification for the proposed changes based on demonstration of adequate coverage without placing undue burden on the on-shift staff.

The proposed changes have been reviewed considering the requirements of 10 CFR 50.47, "Emergency plans," paragraph (b), 10 CFR 50 Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," and other applicable NRC guidance documents. The review determined that the proposed changes to Table B-1 constitute a decrease in effectiveness because they affect shift staffing levels implemented to address a specific staffing deficiency and therefore, result in a decrease in the effectiveness of the emergency plan due to a lack of timeliness in response and degraded capability to respond.

Attachment 1 to this letter provides a discussion of the proposed changes and justification for the changes. Attachment 2 provides a marked-up copy of the CPS Table B-1 from the emergency plan reflecting the proposed changes.

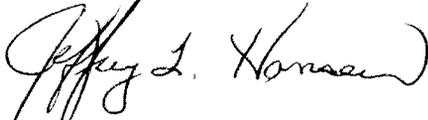
There are no regulatory commitments associated with the changes proposed by this request.

EGC requests approval of the proposed changes by June 19, 2010. Once approved the changes will be implemented into the CPS emergency plan and implementing procedures within 30 days.

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Should you have any questions concerning this letter, please contact Mr. Timothy A. Byam at 630-657-2804.

Respectfully,

A handwritten signature in black ink, appearing to read "Jeffrey L. Hansen". The signature is written in a cursive style with a large, sweeping initial "J".

Jeffrey L. Hansen  
Manager - Licensing  
Exelon Generation Company, LLC

**Attachments:**

- Attachment 1: Description of Proposed Changes and Justification for Revision to CPS Emergency Plan Table B-1
- Attachment 2: Mark-up of Proposed Changes to CPS Emergency Plan Table B-1

## ATTACHMENT 1

### Description of Proposed Changes and Justification for Revision to CPS Emergency Plan Table B-1

#### I. Introduction

The specific requirement for establishing a shift emergency organization to respond to emergency events is contained in 10 CFR 50.47, "Emergency plans," paragraph (b)(2) which states, in part, the following:

"On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial accident response in key functional areas is maintained at all times..."

NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, dated March 2002, Section II.B, "Onsite Emergency Organization," provides the guidance for meeting the above requirements. This guidance describes the onsite emergency organization, including the staffing requirements found in Table B-1, "Minimum Staffing Requirements for NRC Licensees for Nuclear Power Plant Emergencies." This table specifies a minimum of 10 on-shift responders in four functional areas. It also specifies on-shift responders who perform response duties that may be performed by shift personnel who are assigned other functions.

The proposed changes to Clinton Power Station (CPS) Table B-1, "Minimum Staffing Requirements for the On-Shift Clinton Station ERO," will continue to exceed the on-shift staffing guidance contained in NUREG-0654. This evaluation justifies that the reallocation of functions between Emergency Response Organization (ERO) responders does not reduce or impede the ability of CPS to perform the tasks that are required to respond to an emergency event.

CPS proposes the following revisions to CPS Emergency plan Table B-1.

- Increase Non-Licensed Operator staffing from 2 to 4.
- Allow In-Plant Protective Actions to be performed by personnel assigned other functions.
- Replace Mechanical Maintenance person with a Non-Licensed Operator.

These proposed changes meet or exceed the total number of on-shift personnel as defined by NUREG-0654 and do not reduce the functionality of tasks required to be performed. Therefore, from an ERO performance stand point this change does not reduce the effectiveness of the Emergency Plan.

However, Exelon Generation Company, LLC (EGC) is addressing these changes as a decrease in effectiveness since the changes include the removal of two of the three Radiation Protection (RP) personnel that were added to Table B-1 in 1998 as a corrective action to support timely minimum staffing. The addition of these personnel in 1998 may be considered a commitment since the change was performed as a corrective action in order to meet a planning standard and therefore, prior NRC approval of this change is requested.

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#### II. Background

In February 1998, plant equipment malfunctions resulted in a loss of shutdown cooling. Off Normal procedures were entered in response to plant conditions. The on-duty shift supervisor (SS) declared an Alert at approximately 0410 hours to obtain additional resources in restoring shutdown cooling capabilities. Following the Alert declaration, CPS Emergency Response Organization (ERO) facilities were not activated within the specified time period because minimum staffing of the facilities was not obtained in a timely manner. One of the deficiencies identified following activation of the ERO involved the late arrival of RP personnel.

During Root Cause Evaluation of the event, CPS identified a number of issues that led to the late facility staffing. Some of the issues identified include the following.

- Not all ERO Responders had their ERO badges with them. ERO badges were issued to all ERO responders to indicate they were qualified to respond to the emergency event. Failure of ERO Responders to carry their ERO badges caused unnecessary hold ups in accessing the Protected Area as Security had to validate each responders ERO qualifications prior to allowing access.
- The Main Control Room was not timely in notifying Security to activate the ERO.
- Some 30 minute and 60 minute responders incurred unexpected delays in arriving at the site including stopping to put gas in their car and performing normal personal morning routine activities prior to going to work for the day.

As a result of the root cause evaluation, CPS implemented a corrective action to increase the on-shift staffing for RP personnel from one individual to four. The addition of these three RP personnel was the corrective action to address the failure to meet minimum staffing requirements due to the late arrival of RP personnel. These additional on-shift RP personnel were intended to ensure that adequate staffing would be available during the early part of an event.

In 2002, CPS revised the ERO staffing levels, as defined in the CPS Emergency Plan, to remove two of three RP personnel that were added in 1998. However, the total number of on-shift staff personnel remained the same with the credit taken for two individuals reporting to the Operations group. Following this change, CPS ERO staffing still exceeded the guidance set forth in NUREG-0654 for minimum ERO staffing. This revision was made under the 10 CFR 50.54(q) process and did not provide sufficient justification for this change. The change process also did not address how the removal of these two RP personnel could be perceived as a decrease in effectiveness.

This issue was identified in May 2009 as a Decrease in Effectiveness by the NRC. As a result, CPS has realigned current shift staffing in accordance with the 1998 Table B-1 staffing requirements.

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#### III. Justification

##### In-Plant Protective Actions to be performed by personnel assigned other functions

CPS is proposing to remove the two on-shift RP personnel assigned for In-Plant Protective Actions. As noted above, these on-shift positions were added in 1998 as a corrective action due to issues with timeliness of personnel staffing during an emergency event. CPS proposes to allow these duties to be performed by personnel assigned other functions.

CPS will still maintain two RP personnel assigned for emergency events as on-shift staffing. This change re-aligns CPS on-shift staffing with that specified in NUREG-0654 prior to the 1998 corrective actions associated with the RP personnel.

Table 2 of Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements," provides NRC guidance in the area of minimum onsite emergency response staffing levels. The following major tasks are those designated to be met by on-shift RP personnel.

- Access control
- Personnel monitoring
- Dosimetry
- In plant surveys
- HP coverage for repair, corrective actions, search and rescue, first-aid, and firefighting

The assigned two on-shift RP personnel, whose tasks are dose assessment and in-plant surveys, are available to accompany personnel entries into the CPS radiologically controlled area (RCA) for accident mitigation during the early stages of the accident. These two RP personnel will be available at the scene of in-plant operations to provide radiological assessment, decision-making, and radiological leadership.

Some Radiation Protection Technician (RPT) support functions associated with in-plant protective actions such as access control, personnel monitoring, dose assessment, and dosimetry now require less dedicated support time since they are covered by plant process enhancements such as newer technology and tools. The improved technology and tools use available equipment such as portal monitors, self-alarming dosimeters, and an automated access control point. All onsite ERO members expected to be dispatched into the plant for evaluation, operations or repair activities are Radiation Worker qualified and understand and are trained on how to use the available tools.

The following provides a summation of the improved technology and tools associated with the in-plant protective actions.

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- a. Access Control
- Access to the radiologically controlled area (RCA) is controlled electronically. The electronic access control system provides for the user to electronically sign radiation work permits (RWPs) to self authorize themselves to access the RCA and self issuance of an electronic dosimeter in addition to the assigned TLD that is always worn. Access to the RCA is controlled electronically without interface with an RPT.
  - Access entry points to high radiation areas are controlled by lock and key. Operations maintain high radiation area keys for needed access under emergency conditions. Personnel access to high radiation areas is controlled by station program procedures.
- b. Personnel monitoring
- Personnel are issued TLDs quarterly that are continuously worn for constant monitoring. No RPT support is needed for issuance of TLDs to on-shift emergency workers.
  - Secondary dosimeters are self-issued through the electronic access control system. The secondary dosimeters are self-reading, alarming, electronic dosimeters that provide readout of accumulated dose and ambient dose rate. No RPT support is needed for issuance of electronic dosimeters since issuance and use of the electronic dosimeters are part of radiation worker training.
  - Automated whole body monitors provide contamination monitoring. All radiation workers are qualified to use the automated whole body monitors without RPT interface.
  - In circumstances when the automated whole body monitors are not available, hand held friskers are used for personnel contamination monitoring. All radiation workers are qualified to use the hand held friskers without RPT interface.
- c. Dosimetry
- Personnel are issued TLDs quarterly that are continuously worn for constant monitoring. No RPT support is needed for issuance of TLDs to on-shift emergency workers.
  - As described above, secondary dosimeters are self-issued through the electronic access control system. No RPT support is needed for issuance of electronic dosimeters.
  - If a TLD is lost or damaged under emergency conditions, additional TLDs are staged for emergency issuance. Emergency issuance requires a TLD number and name of the person to who it is issued. This task does not require an ANSI qualified RPT to perform.
  - If an electronic dosimeter is lost or damaged, additional electronic dosimeters are maintained in a fast-activation mode for immediate

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monitoring. This task does not require an ANSI qualified RPT to perform.

- Additionally, if an electronic dosimeter is lost or damaged, self-reading pencil dosimeters are pre-stage for emergency use. Issuance of these do not require an ANSI qualified RPT.

d. In-plant surveys

The proposed change that allows in-plant protective actions to be performed by personnel assigned other functions is based on the knowledge that the need for RP coverage occurs primarily following the onset of fuel damage. NUREG-0654 notes that the range of times between the onset of accident conditions and the start of a major radiological release is on the order of one-half hour to several hours. This assumption for worst-case accident scenarios provides the basis for RP response.

CPS utilizes the Mark III containment design for the containment of source term following design basis accidents. NUREG/CR-6295, "Reassessment of Selected Factors Affecting Siting of Nuclear Power Plants," Table 3-4, notes that for the Grand Gulf Nuclear Power Plant, which also utilizes a Mark III containment design, the earliest a radiological release would occur following the onset of an accident would be 2.3 hours.

Enclosure 1 contains area dose rate data for design basis accidents one hour following an event. This information was obtained from the review of Station Shielding for Post Accident Conditions by Sargent & Lundy Engineers – March 1981 in accordance with NUREG-0660, "NRC Action Plans Developed as a Result of the TMI-2 Accident," Item II.B.2. This review was used to determine the extent of radiological controls that would have to be put in place by RP personnel following the declaration of emergency. The review provided one-hour radiological conditions within CPS following a design basis accident. Enclosure 1 contains a table, which represents the dose rates in normally accessible areas of the power block. Dose rates in the auxiliary building, fuel building and containment would make these areas inaccessible one hour following an event based on this analysis.

The dose rates from this table indicate that the majority of the plant areas needed for access to perform mitigating actions remain accessible without RP coverage following an event.

e. RP coverage for repair, corrective actions, search and rescue, first-aid, and firefighting

CPS Updated Safety Analysis Report (USAR) Chapter 15 describes the design basis events that would require RPT support based on dose rates or contamination events. Overall, the plant design and the operator actions do not necessitate the need for multiple RP personnel. Operator actions from the Main Control Room provide the immediate actions for plant events. The

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RP personnel would be required to establish boundaries for contaminated areas and elevated dose rate areas to control access. However, electronic access control is used to limit any access to the radiologically controlled areas (RCA) while specific area boundaries are being established.

A review of the design basis events verifies that two RP personnel can perform all the RP tasks necessary to respond to the event for the initial 60 minutes.

In addition, CPS does not utilize RP personnel as fire brigade members. This ensures RP personnel are available to support any required RP tasks associated with the emergency event in a timely fashion.

f. Dose assessment

Dose assessment is performed utilizing a computer program. Application of this program to determine projected dose involves input of data obtained from computer Plant Parameter Display System (PPDS) screens. Dose projections can be accomplished from start to finish within three to five minutes. The quick determination of dose assessment allows the assigned RP person for this task time to assist the ERO with other related RP tasks during an emergency event.

g. Corrective actions

The two RP personnel assigned to in-plant protective actions on Table B-1, that EGC is proposing to delete from the on-shift staffing requirements, were added in response to the late arrival of responders to an actual event at CPS in 1998. The late arrival was contributed to by a number of issues for which the following changes have been implemented since 1998 for compensation.

- ERO badges are no longer utilized. The use of these badges lead to delays in plant access as Security had to validate ERO qualifications on responders who did not have their ERO badges prior to allowing plant access. Plant personnel now utilize normal access practices and are not held up for qualification verification.
- The Main Control Room initiates an automated ERO callout system called Dialogics. In 1998 the Main Control Room notified Security of the event and Security would then activate Dialogics. Activation of Dialogics directly from the Main Control Room eliminates delays in transferring information resulting in improved activation and response times.
- Dialogic system changes. The Dialogics system now automatically notifies additional ERO position responders. This ensures additional ERO personnel respond to an emergency event to fill positions.

Therefore, based on the above evaluation, EGC has confirmed that two on-shift RP personnel can provide the necessary support for all Table B-1 functions during the initial 60 minutes of an event. The CPS proposal to re-align Table B-1 to the NUREG-0654 Table B-1 requirements which allows in-plant protective actions to be

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performed by personnel assigned other functions will provide adequate RP response capability during early stages of an emergency event.

#### Replacing Mechanical Responder with a Non-Licensed Operator (NLO)

A review of the NUREG-0654, Table B-1 requirements for fulfilling the maintenance functions during the first 90 minutes of an Emergency Plan event was performed. Operations uses Emergency Operating Procedures (EOP), Appendix R Procedures, and abnormal procedures for response to design basis accidents. This review was based on the need for maintenance personnel to support the actions directed by these procedures.

The necessary timeframe for performing manual actions as well as the training required to perform the tasks was considered. Although the CPS USAR does not state specific testing results for time periods (i.e., minutes), it is assumed under the design of the plant and the results of the USAR testing program that only operator actions in conjunction with normal expected system operation is needed to mitigate events associated with an Emergency Plan classification. Overall, for all items reviewed the need for maintenance personnel within the first 90 minutes of an emergency condition is limited to those actions associated with the Emergency Operating Procedures or for troubleshooting or abnormal system alignment to operate equipment that did not respond as expected during the event.

The following table documents the results of the above review of Operations procedures.

#### Emergency Operating Procedures

<i>Task</i>	<i>Timeframe</i>
Install Jumpers for bypassing various interlocks.	For use during a "beyond design basis" accident, therefore, none assumed or required per EOP philosophy documents.
Install Blocks for bypassing various interlocks.	For use during a "beyond design basis" accident, therefore, none assumed or required per EOP philosophy documents.
Moving barrels of boron for alternate boron injection	For use during a "beyond design basis" accident, therefore, none assumed or required per EOP philosophy documents.

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Based on the above review, no actions were found that required mechanical maintenance actions that operators are not trained to perform. Therefore, NLOs are fully qualified to fulfill the Emergency Plan maintenance function within the specified 90-minute timeframe. All of the actions listed above, including the "beyond design basis" actions, are contained within Operations procedures. These tasks have already been evaluated under the NLO training program as part of the Systematic Approach to Training (SAT) based training process and no additional tasks are required.

Other operator actions that may be required in the first 90 minutes of the event would be to align equipment for repair. This has also been evaluated under the NLO training program and no additional tasks are required.

Based on this review, replacing a Mechanical Maintenance ERO responder with an NLO qualified to perform the required maintenance action has no effect on the performance of associated tasks during the early part of an event and maintains the effectiveness of the ERO on-shift maintenance response staff.

#### Non-Licensed Operator (NLO) addition

The on-shift staff must be capable of taking emergency actions to safely shut down the reactor, mitigate accident consequences, notify augmented ERO staff, perform firefighting and provide medical assistance if needed. Increasing the number of NLO staffing from 2 to 4 improves the response of site personnel whose emergency plan role is to assist with operator and maintenance response to the emergency event and provides an increased number of personnel for repair and corrective actions.

#### IV. **Conclusion**

The proposed changes to the CPS Emergency Plan Table B-1, "Minimum Staffing Requirements for the On-Shift Clinton Station ERO," were evaluated against the following criteria.

- NUREG-0654 Table B-1 staffing guidance
- Functional areas and tasks listed in NUREG-0654
- Plant operations during design basis accidents
- RP personnel tasks associated with design basis accidents
- Radiological accident assessment

The reallocation of functions between ERO responders and the addition of two NLOs does not reduce the minimum number of on-shift staffing, nor does it reduce or impede the tasks that the station is required to perform during an emergency event. Since NUREG-0654, Table B-1, allows in-plant protective actions to be performed by personnel assigned other functions during the early stages of an

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emergency event, the proposed changes to CPS Table B-1 would still satisfy the planning standard established by NUREG-0654.

These changes still exceed the number of on-shift staffing personnel as defined by NUREG-0654 and do not reduce the functionality of tasks required to be performed. Therefore, from an ERO performance stand point this change does not reduce the effectiveness of the Emergency Plan.

However, the proposed change may be perceived as a decrease in effectiveness based on the removal of two of the three RP personnel that were added to the CPS Emergency Plan Table B-1 in 1998 as a corrective action to support timely minimum staffing. The addition of RP personnel in 1998 was done in response to the failure of CPS to achieve required minimum staffing within the specified time frame during a classified event. But as discussed in this evaluation the process improvements made by CPS associated with the activation of the ERO will ensure emergency responders will be available on-site in the allotted time frame. Additionally, the station has successfully demonstrated the capability to fully staff and activate the ERO facilities in a September 16, 2004 off hours augmentation drive-in drill.

**Enclosure 1**

**Station Shielding for Post Accident Conditions  
March 1981**

Area radiation level data was obtained from the review of station shielding performed by Sargent & Lundy in accordance with NUREG-0660, "NRC Action Plans Developed as a Result of the TMI-2 Accident," Item II.B.2.

The review provided one hour and one day radiological conditions within Clinton Power Station (CPS) following a design basis accident. The following table represents the dose rates in normally accessible areas of the CPS power block. Dose rates in the auxiliary building, fuel building and containment would make them inaccessible one hour following an event based on this analysis.

<b>Turbine Building</b>	<b>Area Dose Rates</b>
800' elevation	10-100 Rem/hr on south half of area due to gamma shine from containment
781'	Less than 0.015 Rem
762'	Less than 0.015 Rem
737'	Less than 0.015 Rem
712'	Less than 0.015 Rem
<b>Radwaste Building</b>	<b>Area Dose Rates</b>
781'	Less than 0.015 Rem
762'	Less than 0.015 Rem
737'	Less than 0.015 Rem
720'	Less than 0.015 Rem
702'	Less than 0.015 Rem
<b>Control/Diesel Generator</b>	<b>Area Dose Rates</b>
825'	Elevated dose rates from VC filter package (variable based on release activity of plant vent)
800'	Less than 0.015 Rem
781'	Less than 0.015 Rem
762'	Less than 0.015 Rem

**Enclosure 1**

**Station Shielding for Post Accident Conditions  
March 1981**

737'	Floor areas above the SGTS 1`0-100 R, area over H2 Recombiner .1-1R all other areas less than 0.015 Rem.
719'	SGTS rooms >500 R, H2 Recombiner >500 R/hour, all other areas less than 0.015 Rem
702'	VR/VQ and H2 Recombiner areas >500 R/hour, all other areas less than .1 - 1 Rem

ATTACHMENT 2

Mark-up of Proposed Changes to CPS Emergency Plan Table B-1

## Section 2: Organizational Control of Emergencies

### 2.1 On-Shift Emergency Response Organization Assignments

Initial response to any emergency is by the normal plant organization present at the site. This organization includes positions that are onsite 24 hours per day and is described in Table B-1 below.

Table B-1: Minimum Staffing Requirements for the On-Shift Clinton Station ERO

Functional Area	Major Tasks	Emergency Positions	Minimum Shift Size
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Manager Shift Supervisor Nuclear Station Operator Non-Licensed Operator	1 1 2 <del>2</del> 4
2. Emergency Direction and Control	Command and Control	Shift Emergency Director (CR)	1 <sup>(a)</sup>
3. Notification & Communication	Emergency Communications	Plant Shift Personnel	1
4. Radiological Assessment	Offsite Dose Assessment In-plant Surveys Chemistry	Station Personnel (RP) RP Personnel Chemistry Personnel	1 <sup>(a)</sup> <del>2</del> 1 1
5. Plant System Engineering, Repair, and Corrective Actions	Technical Support Repair and Corrective Actions	STA or Incident Assessor (CR) MM/Operations Shift Personnel (OSC) Electrical/I&C Maintenance (OSC)	1 1 1
6. In-Plant Protective Actions	Radiation Protection	RP/Operations Shift Personnel	2 <sup>(a)</sup>
7. Fire Fighting	--	Fire Brigade	5 <sup>(a)(c)</sup>
8. First Aid and Rescue Operations	--	Plant Personnel	2 <sup>(a)</sup>
9. Site Access Control and Personnel Accountability	Security & Accountability	Security Team Personnel	(d)
<b>TOTAL:</b>			<b>15</b>

(a) May be provided by personnel assigned other functions.

(c) Fire Brigade per USAR/Technical Specifications, as applicable. ←

(d) Per Security Plan.

RP personnel are not part of Fire Brigade.