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## CALVERT CLIFFS NUCLEAR POWER PLANT

December 1, 2011

U. S. Nuclear Regulatory Commission  
Washington, DC 20555

**ATTENTION:** Document Control Desk

**SUBJECT:** Calvert Cliffs Nuclear Power Plant; Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318  
Independent Spent Fuel Storage Installation; Docket No. 72-8  
Supplemental Information Re: Request to Adopt Revised Emergency Action Levels

**REFERENCES:**

- (a) Letter from Mr. M. J. Fick (CCNPP) to Document Control Desk (NRC), dated February 1, 2011, Emergency Action Level Changes
- (b) Phone call with Mr. D. A. Johnson (NRC) and Mr. M. J. Fick, et al (CCNPP), dated November 17, 2011.
- (c) Letter from Mr. M. J. Fick (CCNPP) to Document Control Desk (NRC), dated September 23, 2011, Supplemental Information Re: Request to Adopt Revised Emergency Action Levels

In Reference (a), Calvert Cliffs Nuclear Power Plant requested Nuclear Regulatory Commission (NRC) approval for the adoption of revised Emergency Action Levels (EALs) for use at Calvert Cliffs Nuclear Power Plant in accordance with 10 CFR Part 50, Appendix E. The revised EALs are based on Nuclear Energy Institute (NEI) 99-01, Revision 5. In Reference (b), several changes to the EAL Technical Bases submitted in Reference (c) were agreed upon. This supplement provides a copy of the affected EAL Technical Bases pages (strike out version) in Attachment (1). A clean copy of the affected EAL Technical Bases pages is also provided [Attachment (2)]. These pages supersede the same clean copy pages of the EAL Technical Bases provided in Reference (c).

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NWS24

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Should you have questions regarding this matter, please contact me at (410) 495-5216 or Mr. Douglas E. Lauver at (410) 495-5219.

Very truly yours,

A handwritten signature in black ink that reads "Michael J. Fick". The signature is written in a cursive style with a large, stylized "M" and "F".

Michael J. Fick  
Director-Emergency Preparedness

MJF/PSF/bjd

Attachments: (1) EAL Technical Bases pages (strike out version)  
(2) EAL Technical Bases pages

cc: **[w/o Attachments]**  
D. V. Pickett, NRC  
W. M. Dean, NRC

Resident Inspector, NRC  
S. Gray, DNR

**ATTACHMENT (1)**

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**EAL TECHNICAL BASES PAGES (STRIKE OUT VERSION)**

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## EMERGENCY RESPONSE PLAN IMPLEMENTING PROCEDURES

## EMERGENCY ACTION LEVEL TECHNICAL BASES DOCUMENT

Non-Safety-Related \_\_\_\_\_

<u>Writer:</u>	_____	_____
	Printed Name and Signature	Date
<u>Reviewer:</u>	_____	_____
	Printed Name and Signature	Date
<u>Director - EP:</u>	_____	_____
	Printed Name and Signature	Date
<u>POSRC Mtg. #:</u>	_____	_____
	Printed Name and Signature	Date
<u>Approved:</u>	_____	_____
	Printed Name and Signature	Date



EMERGENCY ACTION LEVEL  
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**Category:** H – Hazards and Other Conditions Affecting Plant Safety  
**Subcategory:** 3 – Hazardous Gas  
**Initiating Condition:** Access to a Vital Area is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of operable equipment required to maintain safe operations or safely shutdown the reactor

**EAL:**

**HA3.1 Alert**

Access to ANY of the following areas ANY Table H-1 area is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of ANY SAFETY-RELATED STRUCTURE, SYSTEM, OR COMPONENT (Note 5):

- Control Room
- 45' West Electrical Penetration Rooms
- 69' Electrical Penetration Rooms
- ECCS Pump Rooms
- Charging Pump Rooms

Note 5: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then EAL HA3.1 should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.

**Table H-1 Safe Shutdown Areas**

- Control Room
- Containment
- Auxiliary Building
- Diesel Generator Rooms
- Intake Structure
- 1A/0C DG Buildings
- RWT
- RWT Rooms
- CST No. 12
- FOST No. 21
- Auxiliary Feed Pump Rooms

**Mode Applicability:**



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All

**Basis:**

Generic

Gases in a Vital Area can affect the ability to safely operate or safely shutdown the reactor.

The fact that SCBA may be worn does not eliminate the need to declare the event.

Declaration should not be delayed for confirmation from atmospheric testing if the atmosphere poses an immediate threat to life and health or an immediate threat of severe exposure to gases. This could be based upon documented analysis, indication of personal ill effects from exposure, or operating experience with the hazards.

~~If access is not required at the time the unsafe concentrations exist in the affected area or if the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.~~

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Flammable gasses, such as hydrogen and acetylene, are routinely used to maintain plant systems (hydrogen) or to repair equipment/components (acetylene - used in welding). This EAL assumes concentrations of flammable gasses which can ignite/support combustion.

Escalation of this emergency classification level, if appropriate, will be based on EALs in Category S, Category F or Category R.

Plant-Specific

~~—Locations designated in the EAL are those areas that are required for Cold Shutdown that cannot be completed from the Control Room. Table H-1 Safe Shutdown Areas include all Class I Structures and structures containing Class I equipment and systems needed for safe shutdown.~~

~~—If hazardous gas concentration in a Table H-1 area restricts access but the equipment is not required to be operable or will not be required to operate before access can be reestablished (e.g., fans are ventilating the area), this EAL should not be declared.~~



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—Definitions:

**Safety-Related Structures, Systems and Components** (as defined in 10CFR50.2)

These structures, systems and components that are relied upon to remain functional during and following design basis events to assure:

- (1) The integrity of the reactor coolant pressure boundary;
- (2) The capability to shut down the reactor and *maintain* it in a safe shutdown condition;
- (3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures.

**CCNPP Basis Reference(s):**

- 1. Drawing 61502 Plant Property and Buildings
- 2. UFSAR Section 5A.2 Classes of Structures, Systems, and Equipment
- 31. NEI 99-01 HA3

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**Category:** S – System Malfunction  
**Subcategory:** 5 – Instrumentation  
**Initiating Condition:** Unplanned loss of safety system annunciation or indication in the Control Room for  $\geq 15$  min.

**EAL:**

**SU5.1 Unusual Event**

UNPLANNED loss of greater than approximately 75% of safety system annunciation or indication on Control Room panels for  $\geq 15$  min. (Note 4)

Note 4: The ED should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time

**Mode Applicability:**

1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown

**Basis:**

Generic

This EAL is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

Recognition of the availability of computer based indication equipment is considered.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Quantification is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions.

It is further recognized that plant design provides redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the UE is based on EAL SU4.1.

Annunciators or indicators for this EAL include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

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Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This UE will be escalated to an Alert based on a concurrent loss of compensatory indications or if a significant transient is in progress during the loss of annunciation or indication.

Plant-Specific

The Control Room Panels that house safety related annunciators are listed in the table below:

<u>Unit 1</u>	<u>Unit 2</u>
<u>1C04</u>	<u>2C04</u>
<u>1C05</u>	<u>2C05</u>
<u>1C06</u>	<u>2C06</u>
<u>1C07</u>	<u>2C07</u>
<u>1C08</u>	<u>2C08</u>
<u>1C09</u>	<u>2C09</u>
<u>1C10</u>	<u>2C10</u>
<u>1C13</u>	<u>2C13</u>
<u>1C18A</u>	<u>1C19C</u>
<u>1C18B</u>	<u>1C20</u>
<u>1C19C</u>	<u>1C20A</u>
<u>1C22</u>	<u>1C20B</u>
<u>1C24B</u>	<u>1C22</u>
<u>1C26</u>	<u>1C24B</u>
<u>1C33</u>	<u>1C26</u>
<u>1C34</u>	<u>1C33</u>
	<u>1C34</u>

Definitions:

**Unplanned**

A parameter change or an event, the reasons for which may be known or unknown, that is not the result of an intended evolution or expected plant response to a transient.



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**CCNPP Basis Reference(s):**

1. UFSAR Sections 7.6 and 7.7
2. AOP-7J Loss of 120 Volt Vital AC or 125 Volt Vital DC Power
3. UFSAR 7.5.5
4. OI-50A Plant Computer
5. CNG-OP-1.01-2003 Alarm Response and Control
6. NEI 99-01 SU3

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**Category:** S – System Malfunction  
**Subcategory:** 5 – Instrumentation  
**Initiating Condition:** Unplanned loss of safety system annunciation or indication in the Control Room with either (1) a significant transient in progress, or (2) compensatory indicators are unavailable

**EAL:**

**SA5.1 Alert**

UNPLANNED loss of greater than approximately 75% of safety system annunciation or indication on Control Room panels for  $\geq 15$  min. (Note 4)

**AND EITHER:**

A significant transient is in progress, Table S-2

**OR**

Compensatory indications are unavailable (Plant Computer, SPDS)

Note 4: The ED should **not** wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time

**Table S-2 Significant Transients**

- Automatic turbine runback > 25% thermal power
- Electric load rejection > 25% full electrical load
- Reactor trip
- Safety Injection actuation

**Mode Applicability:**

1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown

**Basis:**

Generic

This EAL is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a significant transient.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Quantification is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Manager be tasked with making a judgment

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decision as to whether additional personnel are required to provide increased monitoring of system operation.

It is further recognized that most plant designs provide redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the UE is based on EAL SU4.1.

Annunciators or indicators for this EAL include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

"Compensatory indications" in this context includes computer based information such as Plant Process Computer and SPDS.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor the transient in progress due to a concurrent loss of compensatory indications with a significant transient in progress during the loss of annunciation or indication.

Plant-Specific

Plant Process Computer and SPDS are considered compensatory indication.

Significant transients are listed in Table S-2.

The Control Room Panels that house safety related annunciators are listed in the table below:

<u>Unit 1</u>	<u>Unit 2</u>
<u>1C04</u>	<u>2C04</u>
<u>1C05</u>	<u>2C05</u>
<u>1C06</u>	<u>2C06</u>
<u>1C07</u>	<u>2C07</u>
<u>1C08</u>	<u>2C08</u>
<u>1C09</u>	<u>2C09</u>
<u>1C10</u>	<u>2C10</u>



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<a href="#">1C18A</a>	<a href="#">1C19C</a>
<a href="#">1C18B</a>	<a href="#">1C20</a>
<a href="#">1C19C</a>	<a href="#">1C20A</a>
<a href="#">1C22</a>	<a href="#">1C20B</a>
<a href="#">1C24B</a>	<a href="#">1C22</a>
<a href="#">1C26</a>	<a href="#">1C24B</a>
<a href="#">1C33</a>	<a href="#">1C26</a>
<a href="#">1C34</a>	<a href="#">1C33</a>
	<a href="#">1C34</a>

Definitions:

**Unplanned**

A parameter change or an event, the reasons for which may be known or unknown, that is not the result of an intended evolution or expected plant response to a transient.

**CCNPP Basis Reference(s):**

1. UFSAR Sections 7.6 and 7.7
2. AOP-7J Loss of 120 Volt Vital AC or 125 Volt Vital DC Power
3. UFSAR 7.5.5
4. OI-50A Plant Computer
5. CNG-OP-1.01-2003 Alarm Response and Control
6. NEI 99-01 SA4

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**Category:** S – System Malfunction  
**Subcategory:** 5 – Instrumentation  
**Initiating Condition:** Inability to monitor a significant transient in progress  
**EAL:**

**SS5.1 Site Area Emergency**

Loss of greater than approximately 75% of safety system annunciation or indication on Control Room panels for  $\geq 15$  min. (Note 4)

**AND**

A significant transient is in progress, Table S-2

**AND**

Compensatory indications are unavailable (Plant Computer, SPDS)

Note 4: The ED should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time

**Table S-2 Significant Transients**

- Automatic turbine runback > 25% thermal power
- Electric load rejection > 25% full electrical load
- Reactor trip
- Safety Injection actuation

**Mode Applicability:**

1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown

**Basis:**

Generic

This EAL is intended to recognize the threat to plant safety associated with the complete loss of capability of the Control Room staff to monitor plant response to a significant transient.

"Planned" and "unplanned" actions are not differentiated since the loss of instrumentation of this magnitude is of such significance during a transient that the cause of the loss is not an ameliorating factor.

Quantification is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Manager be tasked with making a judgment



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decision as to whether additional personnel are required to provide increased monitoring of system operation.

It is further recognized that most plant designs provide redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the NOUE is based on EAL SU4.1

A Site Area Emergency is considered to exist if the Control Room staff cannot monitor safety functions needed for protection of the public while a significant transient is in progress.

Annunciators for this EAL are limited to include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g. area, process, and/or effluent rad monitors, etc.)

Indications needed to monitor safety functions necessary for protection of the public include Control Room indications, computer generated indications and dedicated annunciation capability.

"Compensatory indications" in this context includes computer based information such as Plant Process Computer and SPDS.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Plant-Specific

Plant computer and SPDS are considered compensatory indication.

Significant transients are listed in Table S-2.

The Control Room Panels that house safety related annunciators are listed in the table below:

<u>Unit 1</u>	<u>Unit 2</u>
<u>1C04</u>	<u>2C04</u>
<u>1C05</u>	<u>2C05</u>
<u>1C06</u>	<u>2C06</u>
<u>1C07</u>	<u>2C07</u>
<u>1C08</u>	<u>2C08</u>
<u>1C09</u>	<u>2C09</u>



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<a href="#">1C13</a>	<a href="#">2C13</a>
<a href="#">1C18A</a>	<a href="#">1C19C</a>
<a href="#">1C18B</a>	<a href="#">1C20</a>
<a href="#">1C19C</a>	<a href="#">1C20A</a>
<a href="#">1C22</a>	<a href="#">1C20B</a>
<a href="#">1C24B</a>	<a href="#">1C22</a>
<a href="#">1C26</a>	<a href="#">1C24B</a>
<a href="#">1C33</a>	<a href="#">1C26</a>
<a href="#">1C34</a>	<a href="#">1C33</a>
	<a href="#">1C34</a>

**CCNPP Basis Reference(s):**

1. UFSAR Sections 7.6 and 7.7
2. AOP-7J Loss of 120 Volt Vital AC or 125 Volt Vital DC Power
3. UFSAR 7.5.5
4. OI-50A Plant Computer
5. CNG-OP-1.01-2003 Alarm Response and Control
6. NEI 99-01 SS6

**ATTACHMENT (2)**

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**EAL TECHNICAL BASES PAGES**

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**Category:** H – Hazards and Other Conditions Affecting Plant Safety  
**Subcategory:** 3 – Hazardous Gas  
**Initiating Condition:** Access to a Vital Area is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of operable equipment required to maintain safe operations or safely shutdown the reactor

**EAL:**

**HA3.1 Alert**

Access to ANY of the following areas is prohibited due to toxic, corrosive, asphyxiant or flammable gases (Note 5):

- Control Room
- 45' West Electrical Penetration Rooms
- 69' Electrical Penetration Rooms
- ECCS Pump Rooms
- Charging Pump Rooms

Note 5: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then EAL HA3.1 should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.

**Mode Applicability:**

All

**Basis:**

Generic

Gases in a Vital Area can affect the ability to safely operate or safely shutdown the reactor.

The fact that SCBA may be worn does not eliminate the need to declare the event.

Declaration should not be delayed for confirmation from atmospheric testing if the atmosphere poses an immediate threat to life and health or an immediate threat of severe exposure to gases. This could be based upon documented analysis, indication of personal ill effects from exposure, or operating experience with the hazards.

If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.



An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Flammable gasses, such as hydrogen and acetylene, are routinely used to maintain plant systems (hydrogen) or to repair equipment/components (acetylene - used in welding). This EAL assumes concentrations of flammable gasses which can ignite/support combustion.

Escalation of this emergency classification level, if appropriate, will be based on EALs in Category S, Category F or Category R.

#### Plant-Specific

Locations designated in the EAL are those areas that are required for Cold Shutdown that cannot be completed from the Control Room.

#### **CCNPP Basis Reference(s):**

1. NEI 99-01 HA3

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**Category:** S – System Malfunction  
**Subcategory:** 5 – Instrumentation  
**Initiating Condition:** Unplanned loss of safety system annunciation or indication in the Control Room for  $\geq 15$  min.

**EAL:**

**SU5.1 Unusual Event**

UNPLANNED loss of greater than approximately 75% of safety system annunciation or indication on Control Room panels for  $\geq 15$  min. (Note 4)

Note 4: The ED should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time

**Mode Applicability:**

1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown

**Basis:**

Generic

This EAL is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

Recognition of the availability of computer based indication equipment is considered.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Quantification is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions.

It is further recognized that plant design provides redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the UE is based on EAL SU4.1.

Annunciators or indicators for this EAL include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

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Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This UE will be escalated to an Alert based on a concurrent loss of compensatory indications or if a significant transient is in progress during the loss of annunciation or indication.

Plant-Specific

The Control Room Panels that house safety related annunciators are listed in the table below:

Unit 1	Unit 2
1C04	2C04
1C05	2C05
1C06	2C06
1C07	2C07
1C08	2C08
1C09	2C09
1C10	2C10
1C13	2C13
1C18A	1C19C
1C18B	1C20
1C19C	1C20A
1C22	1C20B
1C24B	1C22
1C26	1C24B
1C33	1C26
1C34	1C33
	1C34

Definitions:

**Unplanned**

A parameter change or an event, the reasons for which may be known or unknown, that is not the result of an intended evolution or expected plant response to a transient.

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**CCNPP Basis Reference(s):**

1. UFSAR Sections 7.6 and 7.7
2. AOP-7J Loss of 120 Volt Vital AC or 125 Volt Vital DC Power
3. UFSAR 7.5.5
4. OI-50A Plant Computer
5. CNG-OP-1.01-2003 Alarm Response and Control
6. NEI 99-01 SU3

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**Category:** S – System Malfunction  
**Subcategory:** 5 – Instrumentation  
**Initiating Condition:** Unplanned loss of safety system annunciation or indication in the Control Room with either (1) a significant transient in progress, or (2) compensatory indicators are unavailable

**EAL:**

**SA5.1 Alert**

UNPLANNED loss of greater than approximately 75% of safety system annunciation or indication on Control Room panels for  $\geq 15$  min. (Note 4)

**AND EITHER:**

A significant transient is in progress, Table S-2

**OR**

Compensatory indications are unavailable (Plant Computer, SPDS)

Note 4: The ED should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time

**Table S-2 Significant Transients**

- Automatic turbine runback > 25% thermal power
- Electric load rejection > 25% full electrical load
- Reactor trip
- Safety Injection actuation

**Mode Applicability:**

1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown

**Basis:**

Generic

This EAL is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a significant transient.

"Planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Quantification is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Manager be tasked with making a judgment



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decision as to whether additional personnel are required to provide increased monitoring of system operation.

It is further recognized that most plant designs provide redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the UE is based on EAL SU4.1.

Annunciators or indicators for this EAL include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g., area, process, and/or effluent rad monitors, etc.).

"Compensatory indications" in this context includes computer based information such as Plant Process Computer and SPDS.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor the transient in progress due to a concurrent loss of compensatory indications with a significant transient in progress during the loss of annunciation or indication.

Plant-Specific

Plant Process Computer and SPDS are considered compensatory indication.

Significant transients are listed in Table S-2.

The Control Room Panels that house safety related annunciators are listed in the table below:

Unit 1	Unit 2
1C04	2C04
1C05	2C05
1C06	2C06
1C07	2C07
1C08	2C08
1C09	2C09
1C10	2C10

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1C13	2C13
1C18A	1C19C
1C18B	1C20
1C19C	1C20A
1C22	1C20B
1C24B	1C22
1C26	1C24B
1C33	1C26
1C34	1C33
	1C34

**Definitions:**

**Unplanned**

A parameter change or an event, the reasons for which may be known or unknown, that is not the result of an intended evolution or expected plant response to a transient.

**CCNPP Basis Reference(s):**

1. UFSAR Sections 7.6 and 7.7
2. AOP-7J Loss of 120 Volt Vital AC or 125 Volt Vital DC Power
3. UFSAR 7.5.5
4. OI-50A Plant Computer
5. CNG-OP-1.01-2003 Alarm Response and Control
6. NEI 99-01 SA4

**Category:** S – System Malfunction  
**Subcategory:** 5 – Instrumentation  
**Initiating Condition:** Inability to monitor a significant transient in progress  
**EAL:**

**SS5.1 Site Area Emergency**

Loss of greater than approximately 75% of safety system annunciation or indication on Control Room panels for  $\geq 15$  min. (Note 4)

**AND**

A significant transient is in progress, Table S-2

**AND**

Compensatory indications are unavailable (Plant Computer, SPDS)

Note 4: The ED should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time

**Table S-2 Significant Transients**

- Automatic turbine runback > 25% thermal power
- Electric load rejection > 25% full electrical load
- Reactor trip
- Safety Injection actuation

**Mode Applicability:**

1 - Power Operation, 2 - Startup, 3 - Hot Standby, 4 - Hot Shutdown

**Basis:**

Generic

This EAL is intended to recognize the threat to plant safety associated with the complete loss of capability of the Control Room staff to monitor plant response to a significant transient.

"Planned" and "unplanned" actions are not differentiated since the loss of instrumentation of this magnitude is of such significance during a transient that the cause of the loss is not an ameliorating factor.

Quantification is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Manager be tasked with making a judgment



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decision as to whether additional personnel are required to provide increased monitoring of system operation.

It is further recognized that most plant designs provide redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this EAL due to difficulty associated with assessment of plant conditions. The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10 CFR 50.72. If the shutdown is not in compliance with the Technical Specification action, the NOUE is based on EAL SU4.1

A Site Area Emergency is considered to exist if the Control Room staff cannot monitor safety functions needed for protection of the public while a significant transient is in progress.

Annunciators for this EAL are limited to include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other EALs (e.g. area, process, and/or effluent rad monitors, etc.)

Indications needed to monitor safety functions necessary for protection of the public include Control Room indications, computer generated indications and dedicated annunciation capability.

"Compensatory indications" in this context includes computer based information such as Plant Process Computer and SPDS.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Plant-Specific

Plant computer and SPDS are considered compensatory indication.

Significant transients are listed in Table S-2.

The Control Room Panels that house safety related annunciators are listed in the table below:

Unit 1	Unit 2
1C04	2C04
1C05	2C05
1C06	2C06
1C07	2C07
1C08	2C08
1C09	2C09

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1C10	2C10
1C13	2C13
1C18A	1C19C
1C18B	1C20
1C19C	1C20A
1C22	1C20B
1C24B	1C22
1C26	1C24B
1C33	1C26
1C34	1C33
	1C34

**CCNPP Basis Reference(s):**

1. UFSAR Sections 7.6 and 7.7
2. AOP-7J Loss of 120 Volt Vital AC or 125 Volt Vital DC Power
3. UFSAR 7.5.5
4. OI-50A Plant Computer
5. CNG-OP-1.01-2003 Alarm Response and Control
6. NEI 99-01 SS6