

**Connecticut Yankee Atomic Power Company**

Date of Distribution: 8-19-10

**Notice of Receipt of ISFSI Emergency Operating Procedures**

Change No.: 10-01

To:

Document Control Desk (code Z)

US NRC

Copy No.:

Washington, DC 20555

Copy #I-40

Please revise your controlled copy per instructions below:

INSERT: Index page 1 of 1, dated 8/20/10

EO-2, Rev. 3 effective 8/20/10

EO-3, Rev. 3 effective 8/20/10

EO-4, Rev. 3 effective 8/20/10

ATTACH:

REMOVE:

REPLACE

This acknowledges receipt of the revisions listed above. In addition, all superseded pages have been removed and destroyed.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Please Return This Sheet to the Administrative Office, Connecticut Yankee Within Thirty (30) Days.

A002

**ISFSI Master Document Index (MDI)**


**Emergency Operating Procedures (EO series)**

**08-20-10**

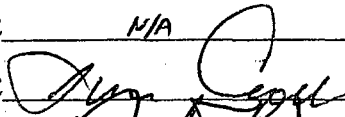


<b>No.</b>	<b>Rev.</b>	<b>Title</b>	<b>50.59</b>	<b>72.48</b>	<b>ISR</b>	<b>QA</b>	<b>RP</b>	<b>Review Date</b>	<b>Effective Date</b>
<u>EO-1</u>	6	Emergency Planning Administration	No	No	No	Yes	Yes	08-19-08	09-19-08
<u>EO-2</u>	3	Response to Off-Normal Operations	Yes	Yes	Yes	No	Yes	08-16-10	08-20-10
<u>EO-3</u>	3	Response to Accidents	Yes	Yes	Yes	No	Yes	08-17-10	08-20-10
<u>EO-4</u>	3	Response to Natural Phenomena	Yes	Yes	Yes	No	Yes	08-17-10	08-20-10
<u>EO-5</u>	4	Emergency Plan Implementation	No	No	Yes	No	Yes	05-27-08	08-20-08
<u>EO-6</u>	10	Non-Emergency Event Assessment	No	No	Yes	No	No	07-22-08	08-06-08

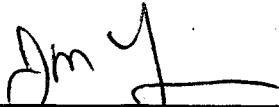
ATTACHMENT B  
CONNECTICUT YANKEE ATOMIC POWER COMPANY  
ISFSI PROCEDURE

**Response to Off-Normal Operations**  
  
EO-2  
  
Rev. 3

Preparer:  Date: 8/15/10

10CFR50.59 / 10CFR72.48 ASSESSMENT	
10CFR50.59 SCREEN REQUIRED?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10CFR50.59 EVALUATION REQUIRED (NO. _____)	<input type="checkbox"/> YES <input type="checkbox"/> NO
10CFR72.48 SCREEN REQUIRED?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10CFR72.48 EVALUATION REQUIRED (NO. _____)	<input type="checkbox"/> YES <input type="checkbox"/> NO

REVIEWER SECTION	
QUALITY ASSURANCE REVIEW: SIGNATURE	<u>M/A</u> DATE: <u>M/A</u>
RADIATION PROTECTION REVIEW: SIGNATURE	<u></u> DATE: <u>8/16/10</u>
TECHNICAL REVIEW: SIGNATURE	<u></u> DATE: <u>8/16/10</u>
INDEPENDENT SAFETY REVIEW: (As Applicable)	
SIGNATURE: <u></u>	DATE: <u>8-18-10</u>

APPROVAL SECTION
ISFSI MANAGER/DESIGNEE SIGNATURE/DATE:
<u></u> <u>8/19/2010</u>

## Response to Off-Normal Operations

### 1.0 PURPOSE

This procedure provides the actions to be taken by ISFSI personnel in response to Off-Normal Conditions affecting a fuel loaded Vertical Concrete Cask (VCC) at the ISFSI.

### 2.0 SCOPE

2.1 The ISFSI Response to Off-Normal Conditions applies to those supporting the operation of the CY ISFSI.

2.2 Off-Normal Conditions addressed by this procedure include:

2.2.1 Blockage of Half of the Air Inlets on a Vertical Concrete Cask [NAC-MPC FSAR 11.1.1]

2.2.2 Failure of Instrumentation on a Vertical Concrete Cask [NAC-MPC FSAR 11.1.3]

2.2.3 Severe Environmental Conditions (Ambient Air Temperature  $< -40^{\circ}\text{F}$  or  $> 100^{\circ}\text{F}$ ) [NAC-MPC FSAR 11.1.4]

2.2.4 Small Release of Radioactive Particulate from the Canister Exterior [NAC-MPC FSAR 11.1.5]

2.2.5 Degraded VCC Thermal Performance ( $\Delta T > 110^{\circ}\text{F}$ )

### 3.0 DEFINITIONS

3.1 Average Ambient Temperature – The average ambient temperature is the average value of the temperature monitoring device(s) monitoring the ambient air temperature in the area around a fuel loaded VCC.

3.2 Operable – The CONCRETE CASK heat removal system is OPERABLE if the difference between the average ISFSI ambient temperature and the average outlet air temperature is  $\leq 110^{\circ}\text{F}$  ( $\Delta T \leq 110^{\circ}\text{F}$ ) or if all four air inlet and outlet screens are visually verified to be unobstructed for the CY-MPC. Failing this the CY-MPC may be declared OPERABLE if an engineering evaluation determines the CONCRETE CASK has adequate heat transfer capabilities to assure continued spent fuel CANISTER and CONCRETE CASK integrity [CofC Appendix A, A1.1]

#### 4.0 REFERENCES

- 4.1 NAC-MPC Final Safety Analysis Report for the NAC-Multi-Purpose Canister System, amendment for Connecticut Yankee Atomic Power Company, Docket 72-1025.
- 4.2 NRC Certificate of Compliance for Spent Fuel Storage Casks, Certificate Number 1025, issued to NAC for the NAC-MPC System.
- 4.3 AD-4, ISFSI Procedure Control Program.
- 4.4 AD-5, ISFSI Work Control Program.
- 4.5 AD-7, Corrective Action Program.
- 4.6 AD-16, ISFSI Personnel Training and Qualifications.
- 4.7 AD-21, Trouble Reports (TR) / Work Requests (WR).
- 4.8 OP-1, ISFSI Temperature Monitoring Program.
- 4.9 OP-2, ISFSI Routine Surveillances.
- 4.10 SP-8, Personnel Access Control.
- 4.11 RP-4, Personnel Radiation Monitoring.
- 4.12 RP-5, Radiation Work Permits.

#### 5.0 RESPONSIBILITIES

- 5.1 ISFSI Shift Supervisor is responsible for ensuring the requirements of this procedure are implemented.
- 5.2 ISFSI Shift Supervisor shall be responsible for the operational command functions.
- 5.3 ISFSI personnel are responsible for performing the actions described in this procedure.
- 5.4 Radiation Protection Manager (or designee) is responsible for maintaining the Radiation Protection Procedures and providing guidance during emergency events.

6.0 PROCEDURE

## 6.1 Notes

- 6.1.1 Partial procedure performance – As identified in ISFSI Procedure Control Program, specific sections, portions of a section, series-of-steps, partial valve lineups or equipment checklist performance is allowed provided the ISFSI Shift Supervisor has reviewed and approved the omissions. Such partial performance will be documented using the N/A process. Other sections (e.g., precautions, prerequisites) must be reviewed for applicability to the evolution being performed.
- 6.1.2 Steps may be marked as “N/A” if the step provides an option for not completing the step.
- 6.1.3 Only personnel meeting the requirements of ISFSI Personnel Training and Qualifications shall perform inspections and data collection.

- 6.2 IDENTIFY the applicable Off-Normal Condition and the Attachment that addresses the required actions:

Off-Normal Condition	Attachment
Blockage of Half of the Air Inlets on a Vertical Concrete Cask	A
Failure of Instrumentation on a Vertical Concrete Cask	B
Ambient Air Temperature (<-40°F or >100°F)	C
Small Release of Radioactive Particulate from the Canister Exterior	D
Degraded VCC Thermal Performance ( $\Delta T > 110^\circ\text{F}$ )	E

**CAUTION**

The Off-Normal events of Failure of Instrumentation on a Vertical Concrete Cask and Severe Environmental Conditions have NAC CoFC requirements for actions to be completed within a prescribed time period of 4 hours.

- 6.3 PERFORM the required actions of the applicable Attachment for the Off-Normal Condition identified.

7.0 SUMMARY OF CHANGES

- 7.1 Added requirements from new Amendments of the FSAR (Ref. 4.1) and CoC (Ref. 4.2)
- 7.2 Changed term “ISFSI Pad Area” to “ISFSI Protected Area”.
- 7.3 Added references to entry requirements into the ISFSI Protected Area.
- 7.4 Modified actions throughout to better define response and meet requirements.

8.0 ATTACHMENTS

- 8.1 Attachment A – Blockage of Half of the Air Inlets on a Vertical Concrete Cask
- 8.2 Attachment B – Failure of Instrumentation on a Vertical concrete Cask
- 8.3 Attachment C – Severe Environmental Conditions
- 8.4 Attachment D – Small Release of Radioactive Particulate from the Canister Exterior
- 8.5 Attachment E – Degraded VCC Thermal Performance ( $\Delta T > 110^{\circ}\text{F}$ )

**ATTACHMENT A**  
**BLOCKAGE OF HALF OF THE AIR INLETS ON A VERTICAL CONCRETE CASK**  
**(Page 1 of 2)**

A.1 AUTOMATIC ACTIONS

None

A.2 IMMEDIATE ACTIONS

A.2.1 NOTIFY the ISFSI Shift Supervisor.

A.2.2 NOTIFY the ISFSI Manager or designee.

A.3 SUBSEQUENT ACTIONS

**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

**CAUTION**

Due to the potential radiation hazard near the surface of the concrete cask and radiation streaming from the air inlets and outlets, personnel should practice ALARA principles:

- Maximize distance from the air vents and minimize stay time around the concrete cask.
- Do NOT remove the VCC inlets or outlets screens without qualified RP personnel present.

INITIALS

- \_\_\_\_\_ A.3.1 OBTAIN permission from ISFSI Shift Supervisor to enter the ISFSI Protected Area.
- A.3.1.1 Enter the ISFSI Protected Area in accordance with SP-8 and RP-4.
- \_\_\_\_\_ A.3.2 **Within 4 hours** of the event, MEASURE and RECORD the temperatures of the air outlets of each VCC, **OR** INSPECT and VERIFY all air inlets and outlets of each affected VCC are not blocked or obstructed, in accordance with ISFSI Temperature Monitoring Program. [CofC Appendix A, A5.3]
- A.3.2.1 At least one-half of the inlets and outlets on each affected cask must be cleared of blockage and debris **within 24 hours**.



**ATTACHMENT A**  
**BLOCKAGE OF HALF OF THE AIR INLETS ON A VERTICAL CONCRETE CASK**  
**(Page 2 of 2)**

**INITIALS**

- \_\_\_\_\_ A.3.3 INSPECT the air inlet screens.
- \_\_\_\_\_ A.3.4 REMOVE any debris on the outside of the air inlet screens using a broom or other long handled tool.
- \_\_\_\_\_ A.3.5 IF debris is not easily accessible and the screens need to be removed, perform the following:
- A.3.4.1 GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and Work Order in accordance with AD-5, ISFSI Work Control Program.
- A.3.4.2 GENERATE a new RWP in accordance with RP-5, Radiation Work Permits.
- \_\_\_\_\_ A.3.6 IF damage is noted GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and a Work Order in accordance with AD-5, ISFSI Work Control Program.
- \_\_\_\_\_ A.3.7 GENERATE a Condition Report in accordance with Corrective Action Program to document the condition.

**ATTACHMENT B**  
**FAILURE OF INSTRUMENTATION ON A VERTICAL CONCRETE CASK**  
**(Page 1 of 1)**

B.1 AUTOMATIC ACTIONS

None

B.2 IMMEDIATE ACTIONS

B.2.1 NOTIFY the ISFSI Shift Supervisor.

B.2.2 NOTIFY the ISFSI Manager or designee.

B.3 SUBSEQUENT ACTIONS**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

**CAUTION**

Due to the potential radiation hazard near the surface of the concrete cask and radiation streaming from the air inlets and outlets, personnel should practice ALARA principles:

- Maximize distance from the air vents and minimize stay time around the concrete cask.
- Do NOT remove the VCC inlets or outlets screens without qualified RP personnel present.

INITIALS

- |       |       |   |
|-------|-------|---|
| _____ | B.3.1 | <b>Within 4 hours</b> of the event, MEASURE <u>and</u> RECORD the temperatures of the air outlets of each VCC, <b>OR</b> INSPECT and VERIFY all air inlets and outlets of each affected VCC are not blocked or obstructed, in accordance with ISFSI Temperature Monitoring Program. [CofC Appendix A, A5.3] |
| _____ | B.3.2 | Enter the ISFSI Protected Area in accordance with SP-8 and RP-4 and PERFORM another means of verifying the VCC heat removal system is operable in accordance with OP-1, Temperature Monitoring Program.   |
| _____ | B.3.2 | GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and a Work Order in accordance with AD-5 to initiate repair of the failed instrument.  |
| _____ | B.3.3 | GENERATE a Condition Report in accordance with Corrective Action Program to document the condition.   |

**ATTACHMENT C**  
**SEVERE ENVIRONMENTAL CONDITIONS**  
**Ambient Air Temperature (<-40°F or >100°F)**  
**(Page 1 of 1)**

C.1 AUTOMATIC ACTIONS

None

C.2 IMMEDIATE ACTIONS

C.2.1 NOTIFY the ISFSI Shift Supervisor.

C.2.2 NOTIFY the ISFSI Manager or designee.

C.3 SUBSEQUENT ACTIONS

**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

**CAUTION**

Due to the potential radiation hazard near the surface of the concrete cask and radiation streaming from the air inlets and outlets, personnel should practice ALARA principles:

- Maximize distance from the air vents and minimize stay time around the concrete cask.
- Do NOT remove the VCC inlets or outlets screens without qualified RP personnel present.

INITIALS

- \_\_\_\_\_ C.3.1 **Within 4 hours** of the event, MEASURE and RECORD the temperatures of the air outlets of each VCC, **OR** INSPECT and VERIFY all air inlets and outlets of each affected VCC are not blocked or obstructed, in accordance with ISFSI Temperature Monitoring Program. [CofC Appendix A, A5.3]
- \_\_\_\_\_ C.3.2 GENERATE a Condition Report in accordance with Corrective Action Program to document the condition.

**ATTACHMENT D**  
**SMALL RELEASE OF RADIOACTIVE PARTICULATE FROM THE CANISTER**  
**EXTERIOR**  
**(Page 1 of 2)**

D.1 AUTOMATIC ACTIONS

None

D.2 IMMEDIATE ACTIONS

D.2.1 NOTIFY the ISFSI Shift Supervisor.

D.2.2 NOTIFY the ISFSI Manager or designee.

D.3 SUBSEQUENT ACTIONS

**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

**CAUTION**

Due to the potential radiation hazard near the surface of the concrete cask and radiation streaming from the air inlets and outlets, personnel should practice ALARA principles:

- Maximize distance from the air vents and minimize stay time around the concrete cask.
- Do NOT remove the VCC inlets or outlets screens without qualified RP personnel present.

INITIALS

\_\_\_\_\_ D.3.1 Do not allow entry to the ISFSI Protected Area until a contamination survey has been performed.

D.3.1.1 Entry into the ISFSI Protected Area is completed in accordance with SP-8 and RP-4.

\_\_\_\_\_ D.3.2 Qualified RP personnel shall PERFORM a detailed radiological contamination survey in accordance with Radiological Surveys to determine the extent of contamination.

\_\_\_\_\_ D.3.3 ISOLATE the area where contamination was found to minimize the spread of contamination.

**ATTACHMENT D**  
**SMALL RELEASE OF RADIOACTIVE PARTICULATE FROM THE CANISTER**  
**EXTERIOR**  
**(Page 2 of 2).**

INITIALS

- |       |       |  |
|-------|-------|--|
| _____ | D.3.4 | REMEDiate any contamination in the area in accordance with the Radiation Protection Manager's (or designee) instructions.            |
| _____ | D.3.5 | GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and a Work Order in accordance with AD-5 to effect repairs. |
| _____ | D.3.6 | GENERATE a Condition Report in accordance with Corrective Action Program to document the event.                                      |

**ATTACHMENT E**  
**DEGRADED VCC THERMAL PERFORMANCE**  
**(Page 1 of 3)**

E.1 AUTOMATIC ACTIONS

None

E.2 IMMEDIATE ACTIONS

E.2.1 NOTIFY the ISFSI Shift Supervisor.

E.2.2 NOTIFY the ISFSI Manager or designee.

E.3 SUBSEQUENT ACTIONS**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

**CAUTION**

Due to the potential radiation hazard near the surface of the concrete cask and radiation streaming from the air inlets and outlets, personnel should practice ALARA principles:

- Maximize distance from the air vents and minimize stay time around the concrete cask.
- Do NOT remove the VCC inlets or outlets screens without qualified RP personnel present.

INITIALS

- \_\_\_\_\_ E.3.1 **Within 4 hours** of the event, MEASURE and RECORD the temperatures of the air outlets of each VCC, **OR** INSPECT and VERIFY all air inlets and outlets of each affected VCC are not blocked or obstructed, in accordance with ISFSI Temperature Monitoring Program. [CofC Appendix A, A5.3]
- E.3.1.1 At least one-half of the inlets and outlets on each affected cask must be cleared of blockage and debris **within 24 hours**. [CofC Appendix A, A5.3]
- \_\_\_\_\_ E.3.2 **Within 8 hours** restore the VCC heat removal system to operable status. [CofC Appendix A, LCO 3.1.6 A.1].
- E.3.2.1 If unable to restore within the allotted time, perform step E.3.7 of this Attachment.

**ATTACHMENT E**  
**DEGRADED VCC THERMAL PERFORMANCE**  
**(Page 2 of 3)**

**INITIALS**

- \_\_\_\_\_ E.3.3 INSPECT the air inlet screens.
- \_\_\_\_\_ E.3.4 REMOVE any debris on the outside of the air inlet screens using a broom or other long handled tool.
- \_\_\_\_\_ E.3.5 IF debris is not easily accessible and the screens need to be removed, perform the following:
- E.3.5.1 GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and Work Order in accordance with AD-5, ISFSI Work Control Program.
- E.3.5.2 GENERATE a new RWP in accordance with RP-5, Radiation Work Permits.
- \_\_\_\_\_ E.3.6 IF damage is noted GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and a Work Order in accordance with AD-5, ISFSI Work Control Program.
- \_\_\_\_\_ E.3.7 If the VCC Heat Removal System is not restored to an operable ( $\Delta T \leq 110^\circ\text{F}$  OR unblocked, unobstructed air inlets and outlets) status within 8 hours of the event, PERFORM the following on the affected VCC **immediately and every 6 hours thereafter** [CofC Appendix A, LCO 3.1.6 B.1].
- (Perform both E.3.7.1 and E.3.7.2)
- E.3.7.1 MEASURE and RECORD the ISFSI ambient air and temperatures of the air outlets of each affected VCC in accordance with ISFSI Temperature Monitoring Program and CONFIRM that the difference between the average VCC air outlet temperature and average ISFSI ambient temperature is not greater than  $110^\circ\text{F}$  ( $\Delta T \leq 110^\circ\text{F}$ )

**OR**

INSPECT and VERIFY all air inlets and outlets of each VCC are not blocked or obstructed in accordance with ISFSI Temperature Monitoring Program.

---

**ATTACHMENT E**  
**DEGRADED VCC THERMAL PERFORMANCE**  
**(Page 3 of 3)**

**INITIALS**

E.3.7.2. Within 12 hours, **PERFORM** the following:

- a. **PERFORM** an engineering evaluation to determine that the concrete heat removal system is operable (Action B.2.1 of LCO 3.1.6 Cof C, Appendix A).

**OR**

- b. **PLACE** the NAC-MPC SYSTEM in a Safe Condition (Action B.2.2 of LCO 3.1.6 Cof C, Appendix A).
  - 1. Perform the engineering evaluation and/or verify a safe condition by contacting NAC International.

\_\_\_\_\_ E.3.8 **INITIATE** a Condition Report in accordance with Corrective Action Program to document the event.




**ATTACHMENT B**  
**CONNECTICUT YANKEE ATOMIC POWER COMPANY**  
**ISFSI PROCEDURE**

**Response to Accidents**

**EO-3**

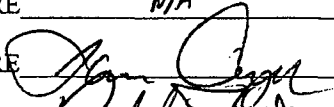
Rev. 3


Preparer:  Date: 8/15/10

10CFR50.59 / 10CFR72.48 ASSESSMENT		
10CFR50.59 SCREEN REQUIRED?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10CFR50.59 EVALUATION REQUIRED (NO. _____)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
10CFR72.48 SCREEN REQUIRED?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10CFR72.48 EVALUATION REQUIRED (NO. _____)	<input type="checkbox"/> YES	<input type="checkbox"/> NO


**REVIEWER SECTION**

QUALITY ASSURANCE REVIEW: SIGNATURE N/A DATE: N/A

RADIATION PROTECTION REVIEW: SIGNATURE  DATE: 8/16/10

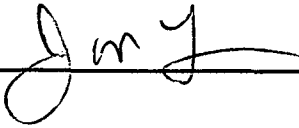
TECHNICAL REVIEW: SIGNATURE  DATE: 8/17/10

INDEPENDENT SAFETY REVIEW: (As Applicable)

SIGNATURE:  DATE: 8-18-10

**APPROVAL SECTION**

ISFSI MANAGER/DESIGNEE SIGNATURE/DATE:

 8/19/2010

## Response to Accidents

### 1.0 PURPOSE

This procedure provides the actions to be taken in response to accidents affecting the Connecticut Yankee (CY) Independent Spent Fuel Storage Installation (ISFSI).

### 2.0 SCOPE

- 2.1 The ISFSI Response to Accidents applies to those supporting the operation of the CY ISFSI.
- 2.2 Accidents addressed by this procedure include: (Reference 4.2)
  - 2.2.1 Explosion [NAC-MPC FSAR 11.2.3]
  - 2.2.2 Fire Accident [NAC-MPC FSAR 11.2.5]
  - 2.2.3 Full Blockage of Air Inlets and Outlets on a Vertical Concrete Cask (VCC) [NAC-MPC FSAR 11.2.8]
  - 2.2.4 Storage Cask 6-inch Drop [NAC-MPC FSAR 11.2.11]
  - 2.2.5 Tip Over of the VCC [NAC-MPC FSAR 11.2.12]

### 3.0 DEFINITIONS

- 3.1 Average Ambient Temperature - The average ambient temperature is the average value of the temperature monitoring device(s), monitoring the ambient air temperature in the area around a fuel loaded VCC.
- 3.2 Operable – The CONCRETE CASK heat removal system is OPERABLE if the difference between the average ISFSI ambient temperature and the average outlet air temperature is  $\leq 110^{\circ}\text{F}$  ( $\Delta T \leq 110^{\circ}\text{F}$ ) or if all four air inlet and outlet screens are visually verified to be unobstructed for the CY-MPC. Failing this the CY-MPC may be declared OPERABLE if an engineering evaluation determines the CONCRETE CASK has adequate heat transfer capabilities to assure continued spent fuel CANISTER and CONCRETE CASK integrity [CofC Appendix A, A1.1].

### 4.0 REFERENCES

- 4.1 NAC-MPC Final Safety Analysis Report for the NAC-Multi-Purpose Canister System, amendment for Connecticut Yankee Atomic Power Company, Docket 72-1025.

- 4.2 NRC Certificate of Compliance for Spent Fuel Storage Casks, Certificate Number 1025, issued to NAC for the NAC-MPC System, Amendment 5, Dated July 24, 2007.
- 4.3 AD-4, ISFSI Procedure Control Program.
- 4.4 AD-5, ISFSI Work Control Program.
- 4.5 AD-7, Corrective Action Program.
- 4.6 AD-16, ISFSI Personnel Training and Qualifications.
- 4.7 AD-21, Trouble Reports (TR) / Work Requests (WR).
- 4.8 EO-5, Emergency Plan Implementation.
- 4.9 OP-1, ISFSI Temperature Monitoring Program.
- 4.10 OP-2, ISFSI Routine Surveillances.
- 4.11 OP-7, ISFSI VCC and ISFSI Pad Inspection Program.
- 4.12 SP-8, Personnel Access Control.
- 4.13 SP-18, Contingencies.
- 4.13 RP-4, Personnel Radiation Monitoring.
- 4.14 RP-5, Radiation Work Permits.

## 5.0 RESPONSIBILITIES

- 5.1 ISFSI Manager is responsible for ensuring the requirements of this procedure are implemented.
- 5.2 ISFSI Shift Supervisor shall be responsible for the operational command functions.
- 5.3 ISFSI personnel are responsible for performing the actions described in this procedure.
- 5.4 Radiation Protection Manager (or designee) is responsible for maintaining the Radiation Protection Procedures and providing guidance during emergency events.

**6.0** PROCEDURE**6.1** Notes

6.1.1 Partial procedure performance – As identified in the ISFSI Procedure Control Program, specific sections, portions of a section, series-of-steps, partial valve lineups or equipment checklist performance is allowed provided the ISFSI Shift Supervisor has reviewed and approved the omissions. Such partial performance will be documented using the N/A process. Other sections (e.g., precautions, prerequisites) must be reviewed for applicability to the evolution being performed.

6.1.2 Steps may be marked as “N/A” if the step provides an option for not completing the step.

6.1.3 Only personnel meeting the requirements of ISFSI Personnel Training and Qualification shall perform inspections and data collection.

**6.2** NOTIFY the ISFSI Shift Supervisor in the event of the following:

6.2.1 Explosion [NAC-MPC FSAR 11.2.3]

6.2.2 Fire Accident [NAC-MPC FSAR 11.2.5]

6.2.3 Full Blockage of Air Inlets and Outlets on a Vertical Concrete Cask [NAC-MPC FSAR 11.2.8]

6.2.4 Storage Cask Drop [NAC-MPC FSAR 11.2.11]

6.2.5 Tip Over of the Loaded VCC [NAC-MPC FSAR 11.2.12]

**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

6.3 Enter the ISFSI Protected Area in accordance with SP-8 and RP-4.

6.4 CONDUCT a radiation dose rate survey and restrict access accordingly.

6.5 ESTABLISH a controlled area around the VCC.

## 6.6 Perform the following subsequent actions:

**CAUTION**

Due to the potential radiation hazard near the surface of the VCC and radiation streaming from the air inlets and outlets and the exposed bottom of the VCC, personnel should practice ALARA principles:

- Maximize distance from the air vents and minimize time around the concrete cask.
- Do NOT remove the air vent screens without qualified HP personnel present.

**INITIALS**

- \_\_\_\_\_ 6.6.1 **Within 4 hours** of the event, INSPECT and VERIFY all air inlets and outlets of each affected VCC are not blocked or obstructed in accordance with ISFSI Temperature Monitoring Program. [CofC Appendix A, A5.3]
- a. At least one-half of the inlets and outlets on each affected cask must be cleared of blockage and debris **within 24 hours**. [CofC Appendix A, A5.3]
- \_\_\_\_\_ 6.6.2 PERFORM initial characterization of the extent of damage to the VCCs by visual inspection, which may be accomplished by the use of remote tools (e.g., cameras, binoculars, etc.).
- \_\_\_\_\_ 6.6.3 DOCUMENT the observed VCC conditions in accordance with the requirements of procedure OP-7.
- \_\_\_\_\_ 6.6.4 IF damage is noted perform the following:
- a. PERFORM actions in accordance with SP-18, Attachment M.
- b. GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21.
- c. GENERATE a Work Order in accordance with AD-5, ISFSI Work Control Program.
- \_\_\_\_\_ 6.6.5 REMOVE any debris on the outside of the air inlet screens using a broom or other long handled tool.
- \_\_\_\_\_ 6.6.6 IF debris is not easily accessible and the screens need to be removed, perform the following:
- a. Notify Radiation Protection Services.

INITIALS

- b. GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and Work Order in accordance with AD-5, ISFSI Work Control Program.
- c. GENERATE a new RWP in accordance with RP-5, Radiation Work Permits.

\_\_\_\_\_ 6.6.7 IF any VCC is inoperable ( $\Delta T > 110$  °F), restore the affected VCCs heat removal system to operable status **within 8 hours**. [CofC Appendix A, LCO 3.1.6 A.1].

\_\_\_\_\_ 6.6.8 If the VCC Heat Removal System is not restored to an operable ( $\Delta T \leq 110$ °F OR unblocked, unobstructed air inlets and outlets) status within 8 hours of the event, PERFORM the following on the affected VCC **immediately** and **every 6 hours thereafter** [CofC Appendix A, LCO 3.1.6 B.1].

(Perform both A and B)

- a. MEASURE and RECORD the ISFSI ambient air and temperatures of the air outlets of each affected VCC in accordance with ISFSI Temperature Monitoring Program and CONFIRM that the difference between the average VCC air outlet temperature and average ISFSI ambient temperature is not greater than 110 °F ( $\Delta T \leq 110$  °F)

OR

INSPECT and VERIFY all air inlets and outlets of each VCC are not blocked or obstructed in accordance with ISFSI Temperature Monitoring Program.

- b. Within 12 hours, PERFORM the following:
  - 1. PERFORM an engineering evaluation to determine that the concrete heat removal system is operable (Action B.2.1 of LCO 3.1.6 Cof C, Appendix A).

OR

- 2. PLACE the NAC-MPC SYSTEM in a Safe Condition (Action B.2.2 of LCO 3.1.6 Cof C, Appendix A).
- 3. Perform the engineering evaluation and/or verify a safe condition by contacting NAC International.

**INITIALS**

- \_\_\_\_\_ 6.6.9 REFER to EO-5, Emergency Plan Implementation, for further guidance. N/A if there is no damage or the damage does not affect shielding capabilities.
- \_\_\_\_\_ 6.6.10 REFER to EO-6, Non-Emergency Event Assessment, for further guidance. N/A if there is no damage or the damage does not affect shielding capabilities.
- \_\_\_\_\_ 6.6.11 INITIATE ISFSI Pad survey to VERIFY dose rates.
- \_\_\_\_\_ 6.6.12 INITIATE a Condition Report in accordance with Corrective Action Program.

**7.0 SUMMARY OF CHANGES**

- 7.1 Added requirements from new Amendments of the FSAR (Ref. 4.1) and CoC (Ref. 4.2)
- 7.2 Added reference documents.
- 7.3 Added references to entry requirements into the ISFSI Protected Area.
- 7.4 Modified actions throughout to better define response and meet requirements.

**8.0 ATTACHMENTS**

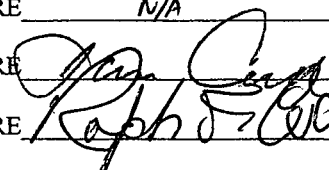
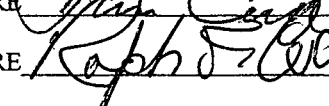
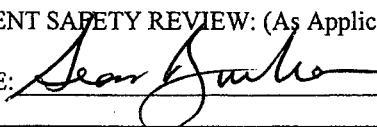
- 8.1 None

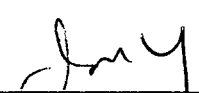
ATTACHMENT B  
CONNECTICUT YANKEE ATOMIC POWER COMPANY  
ISFSI PROCEDURE

**Response to Natural Phenomena**  
**EO-4**  
Rev. 3

Preparer:  Date: 8/15/10

10CFR50.59 / 10CFR72.48 ASSESSMENT		
10CFR50.59 SCREEN REQUIRED?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10CFR50.59 EVALUATION REQUIRED (NO. _____)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
10CFR72.48 SCREEN REQUIRED?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10CFR72.48 EVALUATION REQUIRED (NO. _____)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

REVIEWER SECTION		
QUALITY ASSURANCE REVIEW:	SIGNATURE <u>N/A</u>	DATE: <u>N/A</u>
RADIATION PROTECTION REVIEW:	SIGNATURE <u></u>	DATE: <u>8/16/10</u>
TECHNICAL REVIEW:	SIGNATURE <u></u>	DATE: <u>8/17/10</u>
INDEPENDENT SAFETY REVIEW: (As Applicable)		
SIGNATURE: <u></u>	DATE: <u>8-18-10</u>	

APPROVAL SECTION	
ISFSI MANAGER/DESIGNEE SIGNATURE/DATE:	
<u></u>	<u>8/19/2010</u>



## Responses to Natural Phenomena

### 1.0 PURPOSE

This procedure provides the actions to be taken in response to natural phenomena events affecting the Connecticut Yankee (CY) Independent Spent Fuel Storage Installation (ISFSI).

### 2.0 SCOPE

2.1 The Response to Natural Phenomena applies to personnel supporting the operation of the CY ISFSI.

2.2 Accidents addressed by this procedure include:

2.2.1 Earthquake Event [NAC-MPC FSAR 11.2.2]

2.2.2 Flood [NAC-MPC FSAR 11.2.6]

2.2.3 Tornado and Tornado Driven Missiles [NAC-MPC FSAR 11.2.13]

2.2.4 Maximum Anticipated Heat Load (Ambient Temperature  $>125^{\circ}\text{F}$  [NAC-MPC-FSAR 11.2.10]

### 3.0 DEFINITIONS

3.1 Operable – The CONCRETE CASK heat removal system is OPERABLE if the difference between the average ISFSI ambient temperature and the average outlet air temperature is  $\leq 110^{\circ}\text{F}$  ( $\Delta T \leq 110^{\circ}\text{F}$ ) or if all four air inlet and outlet screens are visually verified to be unobstructed for the CY-MPC. Failing this the CY-MPC may be declared OPERABLE if an engineering evaluation determines the CONCRETE CASK has adequate heat transfer capabilities to assure continued spent fuel CANISTER and CONCRETE CASK integrity [CofC Appendix A, A1.1]

3.2 Average Ambient Temperature - The average ambient temperature is the calculated average of the temperature monitoring device(s) monitoring the ambient air temperature in the area around a fuel loaded VCC.

### 4.0 REFERENCES

4.1 NAC-MPC Final Safety Analysis Report for the NAC-Multi-Purpose Canister System, amendment for Connecticut Yankee Atomic Power Company, Docket 72-1025

- 
- 4.2 NRC Certificate of Compliance for Spent Fuel Storage Casks, Certificate Number 1025, issued to NAC for the NAC-MPC System, Amendment 5, Dated July 24, 2007.
  - 4.3 AD-4, ISFSI Procedure Control Program.
  - 4.4 AD-5, ISFSI Work Control Program.
  - 4.5 AD-7, Corrective Action Program.
  - 4.6 AD-16, ISFSI Personnel Training and Qualifications.
  - 4.7 AD-21, Trouble Reports (TR) / Work Requests (WR).
  - 4.8 EO-5, Emergency Plan Implementation.
  - 4.9 OP-1, ISFSI Temperature Monitoring Program.
  - 4.10 OP-2, ISFSI Routine Surveillances.
  - 4.11 OP-7, ISFSI VCC and ISFSI Pad Inspection Program.
  - 4.12 SP-8, Personnel Access Control.
  - 4.13 SP-18, Contingencies.
  - 4.13 RP-4, Personnel Radiation Monitoring.
  - 4.14 RP-5, Radiation Work Permits.

## 5.0 RESPONSIBILITIES

- 5.1 ISFSI Manager is responsible for ensuring the requirements of this procedure are implemented.
- 5.2 ISFSI Shift Supervisor shall be responsible for the operational command functions.
- 5.3 ISFSI personnel are responsible for performing the actions described in this procedure.
- 5.4 Radiation Protection Manager (or designee) is responsible for maintaining the Radiation Protection Procedures and providing guidance during emergency events.

---

**6.0** PROCEDURE**6.1** Notes

6.1.1 Partial procedure performance – As identified in the ISFSI Procedure Control Program, specific sections, portions of a section, series-of-steps, partial valve lineups or equipment checklist performance is allowed provided the ISFSI Shift Supervisor has reviewed and approved the omissions. Such partial performance will be documented using the N/A process. Other sections (e.g., precautions, prerequisites) must be reviewed for applicability to the evolution being performed.

6.1.2 Steps may be marked as “N/A” if the step provides an option for not completing the step.

6.1.3 Only personnel meeting the requirements of ISFSI Personnel Training and Qualification shall perform inspections and data collection.

**6.2** NOTIFY the ISFSI Shift Supervisor and then the ISFSI Manager in the event of the following:

6.2.1 Earthquake [NAC-MPC FSAR 11.2.2]

6.2.2 Flood [NAC-MPC FSAR 11.2.6]

6.2.3 Tornado and Tornado Driven Missiles [NAC-MPC FSAR 11.2.13]

6.2.4 Ambient Temperature >125°F [NAC-MPC FSAR 11.2.10]

**WARNING**

Some Off-Normal, Accident and Natural Phenomena Events may cause damage to a loaded VCC. Therefore a loss of shielding may not be visually evident.

**6.3** Enter the ISFSI Protected Area in accordance with SP-8 and RP-4.

**6.4** CONDUCT a radiation dose rate survey and control access appropriately.

**6.5** ESTABLISH a security controlled area around the ISFSI.

6.6 Perform the following subsequent actions:

### CAUTION

The surface of the VCC and the air inlets and outlets are potential radiation hazards. Personnel should practice the following ALARA principles:

- Maximize distance from the air vents and minimize time around the concrete cask.
- Do NOT remove the air vent screens without qualified HP personnel present.

### INITIALS

- \_\_\_\_\_ 6.6.1 **Within 4 hours** of the event, INSPECT and VERIFY all air inlets and outlets of each affected VCC are not blocked or obstructed in accordance with ISFSI Temperature Monitoring Program. [CofC Appendix A, A5.3]
- a. At least one-half of the inlets and outlets on each affected cask must be cleared of blockage and debris **within 24 hours**. [CofC Appendix A, A5.3]
- \_\_\_\_\_ 6.6.2 PERFORM initial characterization of the extent of damage to the VCCs by visual inspection, which may be accomplished by the use of remote tools (e.g., cameras, binoculars, etc.).
- \_\_\_\_\_ 6.6.3 DOCUMENT the observed VCC conditions in accordance with the requirements of procedure OP-7.
- \_\_\_\_\_ 6.6.4 IF damage is noted perform the following:
- a. PERFORM actions in accordance with SP-18, Attachment M.
- b. GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21.
- c. GENERATE a Work Order in accordance with AD-5, ISFSI Work Control Program.
- \_\_\_\_\_ 6.6.5 REMOVE any debris on the outside of the air inlet screens using a broom or other long handled tool.
- \_\_\_\_\_ 6.6.6 IF debris is not easily accessible and the screens need to be removed, perform the following:
- a. Notify Radiation Protection Services

INITIALS

- b. GENERATE a Trouble Report/Work Request (TR/WR) in accordance with AD-21, and Work Order in accordance with AD-5, ISFSI Work Control Program.
- c. GENERATE a new RWP in accordance with RP-5, Radiation Work Permits.

\_\_\_\_\_ 6.6.7 IF any VCC is inoperable ( $\Delta T > 110$  °F), restore the affected VCCs heat removal system to operable status **within 8 hours**. [CofC Appendix A, LCO 3.1.6 A.1].

\_\_\_\_\_ 6.6.8 If the VCC Heat Removal System is not restored to an operable ( $\Delta T \leq 110$ °F OR unblocked, unobstructed air inlets and outlets) status within 8 hours of the event, PERFORM the following on the affected VCC **immediately and every 6 hours thereafter** [CofC Appendix A, LCO 3.1.6 B.1].

(Perform both A and B)

- a. MEASURE and RECORD the ISFSI ambient air and temperatures of the air outlets of each affected VCC in accordance with ISFSI Temperature Monitoring Program and CONFIRM that the difference between the average VCC air outlet temperature and average ISFSI ambient temperature is not greater than 110 °F ( $\Delta T \leq 110$  °F)

OR

INSPECT and VERIFY all air inlets and outlets of each VCC are not blocked or obstructed in accordance with ISFSI Temperature Monitoring Program.

- b. Within 12 hours, PERFORM the following:
  - 1. PERFORM an engineering evaluation to determine that the concrete heat removal system is operable (Action B.2.1 of LCO 3.1.6 Cof C, Appendix A).

OR

- 2. PLACE the NAC-MPC SYSTEM in a Safe Condition (Action B.2.2 of LCO 3.1.6 Cof C, Appendix A).
- 3. Perform the engineering evaluation and/or verify a safe condition by contacting NAC International.

**INITIALS**

- \_\_\_\_\_ 6.6.9 REFER to EO-5, Emergency Plan Implementation, for further guidance. N/A if there is no damage or the damage does not affect shielding capabilities.
- \_\_\_\_\_ 6.6.10 REFER to EO-6, Non-Emergency Event Assessment, for further guidance. N/A if there is no damage or the damage does not affect shielding capabilities.
- \_\_\_\_\_ 6.6.11 INITIATE ISFSI Pad survey to VERIFY dose rates.
- \_\_\_\_\_ 6.6.12 INITIATE an ISFSI pad inspection to verify casks have not been repositioned.
- \_\_\_\_\_ 6.6.13 INITIATE a Condition Report in accordance with Corrective Action Program.

**7.0 SUMMARY OF CHANGES**

- 7.1 Added requirements from new Amendments of the FSAR (Ref. 4.1) and CoC (Ref. 4.2)
- 7.2 Added reference documents.
- 7.3 Added references to entry requirements into the ISFSI Protected Area.
- 7.4 Modified actions throughout to better define response and meet requirements.

**8.0 ATTACHMENTS**

- 8.1 None