Revision Description

On July 1, 2003, the NRC provided comments on TSTF-448, Revision 0. Based on the NRC's comments, the following changes are made:

1. A new Condition B is added to address measured inleakage. This Condition applies to minor inleakage or breaches to the control room boundary in which the requirements of the Control Room Habitability Program can still be met with compensatory measures in place. Otherwise, Condition D applies. The Condition requires compensatory actions be initiated immediately and the measured inleakage be within limit within 14 days.

2. Condition C requires a report be submitted to the NRC within 90 days if the Required Actions and associated Completion Times of Condition B are not met.

3. The original Condition B, now Condition D, which applies when two control room ventilation trains are inoperable due to an inoperable control room boundary, is modified to not apply when Condition B is entered and the original 24 hour Completion Time is restored. The Bases state that the Condition applies to significant inleakage or breaches to the control room boundary in which the requirements of the Control Room Habitability Program cannot be met even with compensatory measures in place.

4. The subsequent ACTIONS are renumbered due to the insertions.

5. The inleakage Surveillance is revised to clarify the purpose and acceptance criteria for the SR. The revised wording is consistent with that proposed by the NRC in Regulatory Guide 1.196. The Bases to the Surveillance are revised to more clearly describe the relationship between the Surveillance and the Control Room Integrity Program.

6. The Control Room Integrity Program is revised to reference Regulatory Guide 1.197, Revision 0, May 2003, and to allow for NRC approved, plant-specific exceptions.

7. The Bases Background section of NUREG-1430 (B&W) is revised to be more consistent with the content of the comparable sections in the other ISTS NUREGs.

8. In the July 1 letter, the NRC requested that a statement be added to the Control Room Integrity Program stating that the provisions of SR 3.0.2 are not applicable. Under the ITS usage rules, the provisions of Section 3.0 are not applicable to Frequencies in Chapter 5 unless specifically stated. However, the provisions of SR 3.0.2 should apply to the Frequencies in the Control Room Integrity Program. Control room in-leakage testing is a time-consuming and elaborate test. The provisions of SR 3.0.2 are intended to allow such tests to be scheduled efficiently and integrated into other plant activities. The Staff's comment that there is very limited data concerning control room integrity is not sufficient justification for eliminating this important planning provision. There is no demonstrated safety concern that would prohibit the use of SR 3.0.2 to schedule control room in-leakage testing in an efficient and effective manner. Therefore, a statement that SR 3.0.2 is applicable to the in-leakage testing Frequencies has been added.

3.7 PLANT SYSTEMS

3.7.10 Control Room Emergency Filtration System (CREFS)

LCO 3.7.10 Two CREFS trains shall be OPERABLE.

---NOTE---
The control room boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, 4, [5, and 6],
During movement of [recently] irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREFS train inoperable.	A.1 Restore CREFS train to OPERABLE status.	7 days
B. Two CREFS trains inoperable due to excessive inleakage.	B.1 Initiate compensatory measures. AND B.2 Restore inleakage to within limit specified in the Control Room Integrity Program.	Immediately 14 days
C. Required Action and associated Completion Time of Condition B not met.	C.1 Initiate action in accordance with Specification 5.6.10.	Immediately
D. Two CREFS trains inoperable due to inoperable control room boundary in MODE 1, 2, 3, or 4 for reasons other than Condition B.	D.1 Restore control room boundary to OPERABLE status.	24 hours

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Required Action and associated Completion Time of Condition A or D not met in MODE 1, 2, 3, or 4.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours
F. Required Action and associated Completion Time of Condition A not met [in MODE 5 or 6, or] during movement of [recently] irradiated fuel assemblies.	F.1	----------NOTE---------- [Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.] ----------	
		Place OPERABLE CREFS train in emergency mode.	Immediately
	OR		
	F.2	Suspend movement of [recently] irradiated fuel assemblies.	Immediately
G. Two CREFS trains inoperable [in MODE 5 or 6, or] during movement of [recently] irradiated fuel assemblies for reasons other than Condition B.	G.1	Suspend movement of [recently] irradiated fuel assemblies.	Immediately
H. Two CREFS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Conditions B and D.	H.1	Enter LCO 3.0.3	Immediately

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREFS train for [= 10 continuous hours with the heaters operating or (for systems without heaters) = 15 minutes].	31 days
SR 3.7.10.2	Perform required CREFS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with [VFTP]
SR 3.7.10.3	Verify each CREFS train actuates on an actual or simulated actuation signal.	[18] months
SR 3.7.10.4	Verify one CREFS train can maintain a positive pressure of = [0.125] inches water gauge, relative to the adjacent [turbine building] during the pressurization mode of operation at a makeup flow rate of = [3000] cfm.	[18] months on a STAGGERED TEST BASIS
SR 3.7.10.5	Verify control room inleakage is within the limits as established in accordance with the Control Room Integrity Program.	In accordance with the Control Room Integrity Program

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Emergency Filtration System (CREFS)

BASES

BACKGROUND

The CREFS provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity[, chemicals, or toxic gas].

The CREFS consists of two independent, redundant trains that recirculate and filter the control room air. Each train consists of a prefilter or demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or dampers, and instrumentation also form part of the system, as well as demisters to remove water droplets from the air stream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank.

The CREFS is an emergency system, parts of which may also operate during normal unit operations in the standby mode of operation. Upon receipt of the actuating signal(s), normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system filter trains. The prefilters or demisters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the charcoal adsorbers.

Actuation of the CREFS places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of the emergency mode of operation, depending on the initiation signal. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency radiation state also initiates pressurization and filtered ventilation of the air supply to the control room.

BASES

BACKGROUND (continued)

Outside air is filtered, diluted with building air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the control room. Pressurization of the control room minimizes infiltration of unfiltered air from the surrounding areas of the building. The actions taken in the toxic gas isolation state are the same, except that the signal switches control room ventilation to an isolation alignment to prevent outside air from entering the control room.

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[The air entering the control room is continuously monitored by radiation and toxic gas detectors. One detector output above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.]

A single train will pressurize the control room to about [0.125] inches water gauge. The CREFS operation in maintaining the control room habitable is discussed in the FSAR, Section [6.4] (Ref. 1).

Redundant supply and recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The CREFS is designed in accordance with Seismic Category I requirements.

The CREFS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem whole body dose or its equivalent to any part of the body [or 5 rem TEDE per GDC 19.].

APPLICABLE SAFETY ANALYSES

The CREFS components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access. The CREFS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis accident, fission product release presented in the FSAR, Chapter [15] (Ref. 2).

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The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The worst case single active failure of a component of the CREFS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREFS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent and redundant CREFS trains are required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding a dose of 5 rem whole body or its equivalent to any part of the body [or 5 rem TEDE per GDC-19] to the control room operator in the event of a large radioactive release.

The CREFS is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in both trains. A CREFS train is OPERABLE when the associated:

a. Fan is OPERABLE,

b. HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions, and

c. Heater, demister, ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In addition, the control room boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors. Inleakage must also be maintained such that operator exposure limits are not exceeded.

The LCO is modified by a Note allowing the control room boundary to be opened intermittently under administrative controls. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings (hatches, access panels, floor plugs, etc.), these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening and restore the control room boundary to the design condition when a need for control room isolation is indicated. If the above conditions for utilizing the LCO Note cannot be met, Condition D should be entered.

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BASES

APPLICABILITY

In MODES 1, 2, 3, 4, [5, and 6,] and during movement of [recently] irradiated fuel assemblies, CREFS must be OPERABLE to control operator exposure during and following a DBA.

In [MODE 5 or 6], the CREFS is required to cope with the release from the rupture of an outside waste gas tank.

During movement of [recently] irradiated fuel assemblies, the CREFS must be OPERABLE to cope with the release from a fuel handling accident [involving handling recently irradiated fuel]. [The CREFS is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days), due to radioactive decay.]

ACTIONS

A.1

When one CREFS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREFS train is adequate to perform the control room protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CREFS train could result in loss of CREFS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

B.1 and B.2

If the control room inleakage exceeds the limits in the Control Room Integrity Program, compensatory measures (consistent with the intent of GDC 19) should be initiated immediately to protect control room operators from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Preplanned measures must be available to address these concerns for intentional and unintentional entry into the Condition. This Condition applies to minor inleakage or breaches to the control room boundary in which the objectives of the Control Room Integrity Program can still be met with compensatory measures in place. Action must be taken to restore inleakage to within the limit within 14 days. The 14 day Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 14 day Completion Time is a typically reasonable time to diagnose, plan and repair, and test most problems with control room inleakage.

BASES

ACTIONS (continued)

C.1

Condition C applies when the Required Actions and associated Completion Times for Condition B are not met. This Required Action specifies initiation of actions in Specification 5.6.10, which requires a written report to be submitted to the NRC. This report discusses the preplanned compensatory measures, the cause of the inoperability, and plans and schedule for restoring the control room boundary to OPERABLE status. Consistent with LCO 3.0.2, if the control room boundary is restored to OPERABLE status before the report is due, the report is not required to be submitted. This action is appropriate in lieu of a shutdown requirement since alternative actions are identified which may preclude the loss of functional capability, and given the likelihood of unit conditions that would require the control room boundary to be OPERABLE.

D.1

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----------REVIEWER'S NOTE----------
Adoption of Condition D is dependent on a commitment from the licensee to have written procedures available describing compensatory measures to be taken in the event of an intentional or unintentional entry into Condition D.

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If the control room boundary is inoperable in MODE 1, 2, 3, or 4, the CREFS trains cannot perform their intended functions. Actions must be taken to restore an inoperable control room boundary within 24 hours. During the period that the control room boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. This Condition applies to significant inleakage or breaches to the control room boundary in which the objectives of the Control Room Integrity Program cannot be met even with compensatory measures in place. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the control room boundary.

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In MODE 1, 2, 3, or 4, if the inoperable CREFS train or control room boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.¶
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BASES

ACTIONS (continued)

E.1 and E.2

In MODE 1, 2, 3, or 4, if the inoperable CREFS train or control room boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

F.1 and F.2

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[In MODE 5 or 6, or] during movement of [recently] irradiated fuel assemblies, if the inoperable CREFS train cannot be restored to OPERABLE status within the required Completion Time, action must be taken to immediately place the OPERABLE CREFS train in the emergency mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.

An alternative to Required Action F.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

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Required Action F.1 is modified by a Note indicating to place the system in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.

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G.1

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[In MODE 5 or 6, or] during movement of [recently] irradiated fuel assemblies, with two CREFS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

H.1

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If both CREFS trains are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable control room boundary (i.e., Condition D) or excessive inleakage (i.e., Condition B), the CREFS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal from humidity in the ambient air. [Systems with heaters must be operated for ≥10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥15 minutes to demonstrate the function of the system.] The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

SR 3.7.10.2

This SR verifies that the required CREFS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The [VFTP] includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the [VFTP].

SR 3.7.10.3

This SR verifies that each CREFS train starts and operates on an actual or simulated actuation signal. The Frequency of [18] months is specified in Regulatory Guide 1.52 (Ref. 3).

SR 3.7.10.4

This SR verifies the capability of the CREFS to pressurize the control room envelope. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify this function of the CREFS. During the emergency mode of operation, the CREFS is designed to pressurize the control room ≥[0.125] inches water gauge positive pressure with respect to adjacent areas in order to minimize unfiltered inleakage. The CREFS is designed to maintain this positive pressure with one train at a makeup flow rate of [3000] cfm. The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 4).

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.5

This SR verifies the integrity of the control room envelope by requiring testing for control room inleakage. The details of the inleakage testing are contained in the Control Room Integrity Program. Failure to meet individual requirements of the Control Room Integrity Program does not necessarily make the CREFS inoperable. Each individual failure should be evaluated against the design basis to determine if the CREFS can still perform its safety function. If the CREFS can still perform its safety function, the system is OPERABLE.

REFERENCES

1. FSAR, Section [6.4].
2. FSAR, Chapter [15].
3. Regulatory Guide 1.52, Rev. [2].
4. NUREG-0800, Section 6.4, Rev. 2, July 1981.

INSERT 5A (NUREG-1430, NUREG-1431, NUREG-1432))

5.5.18 Control Room Integrity Program

A Control Room Integrity Program shall be established and implemented to ensure that control room envelope integrity is maintained. The program shall provide controls to limit radioactive gas and toxic gas leakage into the control room from sources external to the control room envelope to levels that support control room habitability. The program shall include guidance on the following elements:

a. Defining the control room envelope boundaries;

b. Assessing control room habitability at the frequencies specified in Regulatory Guide 1.197, Revision 0, May 2003;

c. Testing for control room inleakage in accordance with the testing protocols and at the frequencies specified in Regulatory Guide 1.197, Revision 0, May 2003 [, with the following exceptions:

1. ; and]

d. Maintaining control room envelope integrity.

The provisions of SR 3.0.2 are applicable to the control room inleakage testing frequencies.

INSERT 6B (NUREG-1431)

5.6.10 Control Room Emergency Filtration System Report

When a report is required by Condition C of LCO 3.7.10, "Control Room Emergency Filtration System (CREFS)," a report shall be submitted within the following 90 days. The report shall outline the compensatory measures, the cause of the inoperability, and the plans and schedule for restoring the CREFS to OPERABLE status.

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Emergency Ventilation System (CREVS)

BASES

BACKGROUND

The CREVS provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity[, chemicals, or toxic gas].

The CREVS consists of two independent, redundant, fan filter assemblies. Each filter train consists of a roughing filter, a high efficiency particulate air (HEPA) filter, and a charcoal filter and a fan. Ductwork, valves or dampers, and instrumentation also form part of the system.

The CREVS is an emergency system. Upon receipt of the activating signal(s), the normal control room ventilation system is automatically shut down and the CREVS can be manually started. The roughing filters and water condensing units remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA and charcoal filters. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the water condensing units and heater are important to the effectiveness of the charcoal adsorbers. Actuation of the CREVS places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of the emergency mode of operation, depending on the initiation signal. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency radiation state also initiates pressurization and filtered ventilation of the air supply to the control room.

Outside air is filtered, diluted with building air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the control room. Pressurization of the control room minimizes infiltration of unfiltered air from the surrounding areas of the building. The actions taken in the toxic gas isolation state are the same, except that the signal switches control room ventilation to an isolation alignment to prevent outside air from entering the control room.

[The air entering the control room is continuously monitored by radiation and toxic gas detectors. One detector output above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.]

A single train will pressurize the control room to about 1/8 inch water gauge. The CREVS operation is discussed in the FSAR, Section [9.4] (Ref. 1).

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The CREVS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA), without exceeding a 5 rem whole body dose or its equivalent to any part of the body [or 5 rem TEDE per GDC 19.]

APPLICABLE SAFETY ANALYSES

The CREVS components are arranged in redundant safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access. The CREVS provides airborne radiological protection for the control room operators as demonstrated by the control room accident dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the FSAR, Chapter [15] (Ref. 2).

The worst case single active failure of a CREVS component, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

[For this unit, there are no sources of toxic gases or chemicals that could be released to affect control room habitability.]

The CREVS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).