

NPF-38-159

ATTACHMENT C

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## CONTAINMENT SYSTEMS

### ELECTRIC HYDROGEN RECOMBINERS - W

#### LIMITING CONDITION FOR OPERATION

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3.6.4.2 Two independent containment hydrogen recombiner systems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTION:

With one hydrogen recombiner system inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours.

#### SURVEILLANCE REQUIREMENTS

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4.6.4.2 Each hydrogen recombiner system shall be demonstrated OPERABLE:

- a. At least once per 6 months by verifying during a recombiner system functional test that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes. Upon reaching 700°F, increase the power setting to maximum power for 2 minutes and verify that the power meter reads greater than or equal to 60 kW.
- b. At least once per 18 months by:
  1. Performing a CHANNEL CALIBRATION of all recombiner instrumentation and control circuits,
  2. Verifying through a visual examination that there is no evidence of abnormal conditions within the recombiner enclosure (i.e., loose wiring or structural connections, deposits of foreign materials, etc.).
  3. Verifying the integrity of the heater electrical circuits by performing a resistance to ground test following the above required functional test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms.

## CONTAINMENT SYSTEMS

### BASES

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#### 3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through GDC 57 of Appendix A to 10 CFR Part 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

"Containment Isolation Valves", previously Table 3.6-2, have been incorporated into Plant Procedure UNT-005-026.

#### 3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit is capable of controlling the expected hydrogen generation associated with (1) zirconium-water reactions, (2) radiolytic decomposition of water, and (3) corrosion of metals within containment. These hydrogen control systems are consistent with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," March 1971.

#### 3/4.6.5 VACUUM RELIEF VALVES

The OPERABILITY of the primary containment to annulus vacuum relief valves with a setpoint of less than or equal + 0.3 psid ensures that the containment internal pressure differential does not become more negative than the containment design limit for internal pressure differential of 0.65 psi. This situation would occur, for the worst case, if all containment heat removal systems (containment spray, containment cooling, and other HVAC systems) were inadvertently started with only one vacuum relief valve OPERABLE.

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ATTACHMENT D

## CONTAINMENT SYSTEMS

### ELECTRIC HYDROGEN RECOMBINERS - W

#### LIMITING CONDITION FOR OPERATION

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3.6.4.2 Two independent containment hydrogen recombiner systems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

#### ACTION:

With one hydrogen recombiner system inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours, prior to STARTUP, MODE 2, following the next refueling outage.

With two hydrogen recombiners inoperable, restore one inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours.

#### SURVEILLANCE REQUIREMENTS

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4.6.4.2 Each hydrogen recombiner system shall be demonstrated OPERABLE at least once per 18 months by:

- a. Performing a system functional test for each hydrogen recombiner.
  - a. ~~At least once per 6 months by verifying during a recombiner system functional test that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes. Upon reaching 700°F, increase the power setting to maximum power for 2 minutes and verify that the power meter reads greater than or equal to 60 kW.~~
  - b. ~~At least once per 18 months by:~~
    1. ~~Performing a CHANNEL CALIBRATION of all recombiner instrumentation and control circuits.~~
  - b. Verifying through a Visually examining ation that there is no evidence of abnormal conditions within the recombiner enclosure (i.e., loose wiring or structural connections, deposits of foreign materials, etc.) and verifying there is no evidence of abnormal conditions.
  - c. Performing a resistance to ground test for each heater phase.  
~~Verifying the integrity of the heater electrical circuits by performing a resistance to ground test following the above required functional test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms.~~



## CONTAINMENT SYSTEMS

### BASES

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#### B 3/4 6-3 CONTAINMENT SYSTEMS BASES

##### 3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through GDC 57 of Appendix A to 10 CFR Part 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

"Containment Isolation Valves", previously Table 3.6-2, have been incorporated into Plant Procedure UNT-005 026.

##### 3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit is capable of controlling the expected hydrogen generation associated with (1) zirconium-water reactions, (2) radiolytic decomposition of water, and (3) corrosion of metals within containment. These hydrogen control systems are consistent with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," March 1971.

SURVEILLANCE REQUIREMENT SR 4.6.4.2.a requires performance of a system functional test for each hydrogen recombiner to ensure that the recombiners are operational and can attain and sustain the temperature necessary for hydrogen recombination. In particular, this SR requires verification that the minimum heater sheath temperature increases to  $\geq 700^{\circ}\text{F}$  in  $\leq 90$  minutes. After reaching  $700^{\circ}\text{F}$ , the power is increased to maximum for approximately 2 minutes and verified to be  $\geq 60$  kW.

## CONTAINMENT SYSTEMS

### BASES

SURVEILLANCE REQUIREMENT SR 4.6.4.2.b ensures that there are no physical problems that could affect recombiner operation. Since the recombiners are mechanically passive, they are not subject to mechanical failure. The only credible failures involve loss of power, blockage of the internal flow path, missile impact, etc. A visual inspection is sufficient to determine abnormal conditions that could cause such failures.

SURVEILLANCE REQUIREMENT SR 4.6.4.2.c requires performance of a resistance to ground test for each heater phase to ensure that there are no detectable grounds in any heater phase. This is accomplished by verifying that the resistance to ground for any heater phase is  $\geq 10,000$  ohms.

### 3/4.6.5 VACUUM RELIEF VALVES

The OPERABILITY of the primary containment to annulus vacuum relief valves with a setpoint of less than or equal + 0.3 psid ensures that the containment internal pressure differential does not become more negative than the containment design limit for internal pressure differential of 0.65 psi. This situation would occur, for the worst case, if all containment heat removal systems (containment spray, containment cooling, and other HVAC systems) were inadvertently started with only one vacuum relief valve OPERABLE.