

TECHNICAL SPECIFICATIONS

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5. Reactor Coolant Vent System

- a. A reactor shall not be made or maintained critical nor shall it be heated or maintained above 200°F unless reactor coolant vent system paths from both the reactor vessel head and pressurizer steam space are operable and closed except as specified in 3.1.A.5.b and 3.1.A.5.c below.
- b. During Startup Operation or Power Operation, any one of the following conditions of inoperability may exist for each unit provided Startup Operation is discontinued until operability is restored:
 - 1. Both of the parallel vent valves in the reactor vessel head vent path are inoperable.
 - 2. Both of the parallel vent valves in the pressurizer vent path are inoperable.
 - 3. The vent valve to the pressurizer relief tank discharge line is inoperable.
 - 4. The vent valve to the containment atmospheric discharge line is inoperable.

If during Power Operation operability is not restored within 30 days, the reactor shall be placed in the Hot Shutdown condition. If the requirements of TS 3.1.A.5.a are not satisfied within an additional 48 hours, the reactor shall be placed in the Cold Shutdown condition.

- c. With no reactor coolant vent system path operable, restore at least one vent path to operable status within 72 hours or be in at least the Cold Shutdown condition within the following 48 hours.

Basis (continued)

The requirement that two groups of pressurizer heaters be operable provides assurance that at least one group will be available during a loss of offsite power to maintain natural circulation. Backup heater group "A" is normally supplied by one safeguards bus. Backup heater group "B" can be manually transferred within minutes to the redundant safeguards bus. Tests have confirmed the ability of either group to maintain natural circulation conditions.

The pressurizer power operated relief valves (PORV's) operate to relieve reactor coolant system pressure below the setting of the pressurizer Code safety valves. These relief valves have remotely operated block valves to provide a positive shutoff capability should a relief valve become inoperable. The PORV's are pneumatic valves operated by instrument air. They fail closed on loss of air or loss of power to their DC solenoid valves. The PORV block valves are motor operated valves supplied by the 480 volt safeguards buses.

The Specifications require that at least two methods of removing decay heat are available for each reactor. Above 350°F, both steam generators must be operable to serve this function. Below 350°F, either a steam generator or a residual heat removal loop are capable of removing decay heat and any combination of two loops is specified. If redundant means are not available, the reactor is placed in the cold shutdown condition.

The reactor coolant vent system is provided to exhaust noncondensable gases from the reactor coolant system that could inhibit natural circulation core cooling. The operability of at least one vent path from both the reactor vessel head and pressurizer steam space ensures the capability exists to perform this function.

The vent path from the reactor vessel head and the vent path from the pressurizer each contain two independently emergency powered, energize to open, valves in parallel and connect to a common header that discharges either to the containment atmosphere or to the pressurizer relief tank. The lines to the containment atmosphere and pressurizer relief tank each contain an independently emergency powered, energize to open, isolation valve. This redundancy provides protection from the failure of a single vent path valve rendering an entire vent path inoperable. An inoperable vent path valve is defined as a valve which cannot be opened or whose position is unknown.

A flow restriction orifice in each vent path limits the flow from an inadvertent actuation of the vent system to less than the flow of the reactor coolant makeup system.

References

1FSAR, Section 14.1.9

2Testimony by J Knight in the Prairie Island Public Hearing on January 28, 1975.

4.18 REACTOR COOLANT VENT SYSTEM PATHS

Applicability

Applies to the surveillances performed on the reactor coolant vent system paths to verify operability.

Objective

To assure that the capability exists to vent noncondensable gases from the reactor coolant system that could inhibit natural circulation core cooling.

Specification

A. Vent Path Operability

Each reactor coolant vent system path shall be demonstrated operable prior to commencing Startup Operation after each refueling by:

1. Verifying all manual isolation valves in each vent path are blocked and tagged in the open position.
2. Cycling each solenoid operated valve in the vent paths through at least one complete cycle of full travel from the control room.

B. System Flow Testing

Flow shall be verified through each reactor coolant vent system path during Cold Shutdown or Refueling Shutdown at least once every five years.

Basis

The manual valves in the reactor coolant vent system are blocked and tagged in the open position to eliminate the possibility that operation of the vent system could be blocked by the inadvertent closure of any of the vent system manual valves.

The cycling of each solenoid operated vent valve once each refueling ensures the ability of these valves to open if required to vent the reactor coolant system. More frequent cycling of the valves is not practical because they cannot be isolated from the reactor coolant system while the plant is operating.

Flow testing is performed to assure that there are no blockages in the reactor coolant vent system piping that would prevent venting of noncondensable gases from the reactor coolant system. Flow testing is only performed every five years because of the difficulty involved in performing a flow test of the entire vent system, the low probability of a blockage occurring in the vent system piping and because the reactor vessel head vent path is used to vent the reactor vessel head to the containment during the normal reactor coolant system fill and vent procedure.