

REACTOR COOLANT SYSTEM

OPERATIONAL LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.7.2 Reactor Coolant System leakage shall be limited to:

- a. No PRESSURE BOUNDARY LEAKAGE,
- b. 1 GPM UNIDENTIFIED LEAKAGE,
- c. 1 GPM total primary-to-secondary leakage through all steam generators and 500 gallons per day through any one steam generator,
- d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and
- e. 31 GPM CONTROLLED LEAKAGE at a Reactor Coolant System pressure of 2235 ± 20 psig.
- f. As specified in Table 3.4-1 at a Reactor Coolant System pressure of 2235 ± 20 psig, a maximum allowable leakage of 3 gpm for any Reactor Coolant System Isolation Valve of nominal diameter of 2 inches and of 5 gpm (with certain limitations) for any Reactor Coolant System Isolation Valve of nominal diameter greater than 2 inches.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE, be in at least HOT STANDBY within 6 hours and cold shutdown within the following 30 hours.
- b. With any Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than the above limit, isolate the high pressure portion of the affected system from the low pressure portion within 4 hours by use of at least two closed manual or deactivated automatic valves, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.7.2.1 Reactor Coolant System leakages shall be demonstrated to be within each of the above limits by;

- a. Monitoring the containment atmosphere particulate radioactivity monitor at least once per 12 hours.
- b. Monitoring the containment air cooler condensate level system or containment atmosphere gaseous radioactivity monitor at least once per 12 hours.

TABLE 3.4-1
REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES

| | | | MAX. (#) ALLOWABLE LEAKAGE (GPM) | | | | MAX. (#) ALLOWABLE LEAKAGE (GPM) |
|-------------|--------------------|-------|---|-------------|--------------------|-------|---|
| <u>TPNS</u> | <u>DESCRIPTION</u> | | | <u>TPNS</u> | <u>DESCRIPTION</u> | | |
| Q2E11V001A | 12" | Gate | 5 | Q2E21V062A | 2" | Check | 3 |
| Q2E11V001B | 12" | Gate | 5 | Q2E21V062B | 2" | Check | 3 |
| Q2E11V016A | 12" | Gate | 5 | Q2E21V062C | 2" | Check | 3 |
| Q2E11V016B | 12" | Gate | 5 | Q2E21V066A | 2" | Check | 3 |
| Q2E11V021A | 6" | Check | 5 | Q2E21V066B | 2" | Check | 3 |
| Q2E11V021B | 6" | Check | 5 | Q2E21V066C | 2" | Check | 3 |
| Q2E11V021C | 6" | Check | 5 | Q2E21V076A* | 6" | Check | 5 |
| Q2E11V042A | 10" | Check | 5 | Q2E21V076B* | 6" | Check | 5 |
| Q2E11V042B | 10" | Check | 5 | Q2E21V077A* | 6" | Check | 5 |
| Q2E11V051A | 6" | Check | 5 | Q2E21V077B* | 6" | Check | 5 |
| Q2E11V051B | 6" | Check | 5 | Q2E21V077C | 6" | Check | 5 |
| Q2E11V051C | 6" | Check | 5 | Q2E21V078A | 2" | Check | 3 |
| Q2E21V032A* | 12" | Check | 5 | Q2E21V078B | 2" | Check | 3 |
| Q2E21V032B* | 12" | Check | 5 | Q2E21V078C | 2" | Check | 3 |
| Q2E21V032C* | 12" | Check | 5 | Q2E21V079A | 2" | Check | 3 |
| Q2E21V037A* | 12" | Check | 5 | Q2E21V079B | 2" | Check | 3 |
| Q2E21V037B* | 12" | Check | 5 | Q2E21V079C | 2" | Check | 3 |
| Q2E21V037C* | 12" | Check | 5 | | | | |

(#) A. The limitations for maximum allowable leakage of Reactor Coolant System Isolation Valves with a nominal diameter greater than two inches is as follows:

1. Leakage rates less than or equal to 1.0 gpm are considered acceptable. However, for initial tests, or tests following valve repair or replacement, leakage rates less than or equal to 5.0 gpm are considered acceptable.
2. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered acceptable if the latest measured rate has not exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.
3. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered unacceptable if the latest measured rate exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.
4. Leakage rates greater than 5.0 gpm, are considered unacceptable.

B. The maximum allowable leakage of Reactor Coolant System Isolation Valves with a nominal diameter of two inches is 3 gpm.

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- a. No PRESSURE BOUNDARY LEAKAGE,
- b. 1 GPM UNIDENTIFIED LEAKAGE,
- c. 1 GPM total primary-to-secondary leakage through all steam generators and 500 gallons per day through any one steam generator,
- d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and
- e. 31 GPM CONTROLLED LEAKAGE at a Reactor Coolant System pressure of 2235 ± 20 psig.
- f. ~~1 GPM leakage from any Reactor Coolant System Pressure Isolation Valve specified in Table 3.4-1 at a Reactor Coolant System pressure of 2235 ± 20 psig.~~

↑ As specified in Table 3.4-1 at a Reactor Coolant System pressure of 2235 ± 20 psig, a maximum allowable of 34 ppm for any Reactor Coolant System Isolation Valve of nominal diameter of 2 inches and of 5 ppm (with certain limitations) for any Reactor Coolant System Isolation Valve of nominal diameter greater than 2 inches.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With any Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than the above limit, isolate the high pressure portion of the affected system from the low pressure portion within 4 hours by use of at least two closed manual or deactivated automatic valves, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.7.2.1 Reactor Coolant System leakages shall be demonstrated to be within each of the above limits by;

- a. Monitoring the containment atmosphere particulate radioactivity monitor at least once per 12 hours.
- b. Monitoring the containment air cooler condensate level system or containment atmosphere gaseous radioactivity monitor at least once per 12 hours.

REACTOR COOLANT SYSTEM

TABLE 3.4-1

REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES

This Table was modified
to reflect the valve diameter
and associated maximum
allowable leakage.

Q2E11V016A
Q2E11V001A
Q2E11V016A
Q2E11V001B

Q2E11V051A
Q2E11V051B
Q2E11V051C
Q2E11V021A
Q2E11V021B
Q2E11V021C
Q2E11V042A
Q2E11V042B

Q2E21V077A*
Q2E21V077B*
Q2E21V076A*
Q2E21V076B*

Q2E21V062A
Q2E21V062B
Q2E21V062C
Q2E21V066A
Q2E21V066B
Q2E21V066C
Q2E21V077C
Q2E21V078A
Q2E21V078B
Q2E21V078C
Q2E21V079A
Q2E21V079B
Q2E21V079C

Q2E21V032A*
Q2E21V032B*
Q2E21V032C*
Q2E21V037A*
Q2E21V037B*
Q2E21V037C*

Attachment 2
Safety Evaluation For One-Time Change
of Unit 2 Technical Specification 3/4.4.7.2

I. Background

Technical Specification 3/4.4.7.2 currently specifies the performance of leak tests on all reactor coolant system pressure isolation valves. The acceptance criteria of 1 gpm contained in the Unit 2 Technical Specification has proven to be too restrictive and has resulted in unacceptable delays in the return to power. Alabama Power Company requests a one-time change of Technical Specification 3/4.4.7.2 to modify the acceptance criteria to 3 gpm for reactor coolant isolation valves with a nominal diameter of two inches and 1 to 5 gpm (with certain limitations) for reactor coolant isolation valves with a nominal diameter greater than two inches.

II. References:

- (1) FNP Unit 1 Technical Specification 3/4.3.7.3
- (2) FNP Unit 2 Technical Specification 3/4.4.7.2

III. Bases

It is imperative that the acceptance criteria for reactor coolant system isolation valve leakage be established prior to shutdown in order that this critical path not be impacted. The initial valve testing is performed on the critical path of the unit outage in order to identify valves requiring subsequent repair during the outage. After valve repair and re-installation, the valves are then retested for leakage as a part of the critical path of the return to power. If the results of leak retest do not satisfy the stringent 1-gpm acceptance criteria of the current technical specification, the critical path of the outage may be further impacted due to valve rework, re-installation, retest, and the draindown of reactor coolant system required to repair several of these valves. The difference in acceptance criteria from 1 gpm to 3 or 5 gpm requires a variance in leakage configuration that is negligible, inconsequential, and beyond that which can be affected by reasonable maintenance activities.

As an example, the disk of a six-inch check valve would be elevated from its seat by approximately 0.00004 in. to produce a leak rate of 1 gpm and by approximately 0.00020 in. to produce a leak rate of 5 gpm. To correct small irregularities that produce leak rates between 1 gpm and 3 or 5 gpm, several maintenance and retesting iterations may be necessary. This activity subjects plant personnel to greater radiation exposures, potentially requires draining the reactor coolant system to retest the reworked valve and extends the time before the unit is returned to power.

The Unit 1 leak test acceptance criteria of 1 to 5 gpm, (under certain limitations) have been proven to be adequate in establishing the pressure retaining capability of the valves. As shown by testing experience at Farley Nuclear Plant-Unit 1, valves that did not satisfy either the acceptance criteria of 1 gpm or 1 to 5 gpm were found to contain the same minor valve seating irregularities causing the valves not to seat completely under low test pressures, and no evidence of impending valve failure has been found using either acceptance criteria.

For valves with a nominal diameter of two inches, the acceptance criteria of 3 gpm is requested based on review of past leak rate data for two-inch valves. This data showed that such valves did not produce leak rates greater than 3 gpm. The 3-gpm acceptance criteria was selected for smaller valves since repair is easier, actual leakage rates are not significant, and the ability to meet and maintain lower leakage rates is facilitated. Additionally, the acceptance criteria of 3 gpm is below the 5 gpm criteria that has been proven to establish the pressure retaining capability of the valves.

This proposed one-time change to Unit 2 Technical Specification 3/4.4.7.2 provides for a high assurance of reactor coolant system integrity through surveillance and testing requirements without unwarranted compromise to the health and safety of the public and needless jeopardizing of the timely return of the unit to power operation.

IV. Conclusion

This proposed change to the Unit 2 Technical Specification represents an improvement in testing required for the reactor coolant system pressure isolation valves and does not involve an unreviewed safety question as defined by 10 CFR 50.59.