3.19 SAFETY INJECTION SYSTEM

Applicability: Applies to the condition of safety injection system.

Objective: To define the condition of the safety injection system required during reactor operation.

Specification:

a) None of the following valves may be closed unless the reactor is subcritical:

1. Any safety injection tank isolation valve (SIA-M-11, 21, 31)

2. Any safety injection header isolation valve (HSI-16, 26, 36)

3. Any loop isolation valve (RCM-11, 12, 21, 22, 31, 32)

b) The reactor shall not be critical unless the following conditions are met:

1. The breakers shall be racked out and tagged open for the safety injection tank isolation valves, the power leads shall be removed from the breakers, the bare metal terminal ends taped, and the breakers locked out.

2. The breakers for the loop isolation valves:

(a) Shall be opened, and padlocked in the open position.

(b) The breaker thermal overload links shall be physically removed from the breakers.

(c) An entry describing the above action shall be placed in the Shift Supervisor's Log Book.

Exception: Breakers for loop isolation valves RC-M-21 and RC-M-22 need not be opened and padlocked and the thermal overload links for these valves need not be physically removed during the period between May 5, 1981 and May 9, 1981.

3. The following ECCS check valves shall have been determined to be intact in accordance with Technical Specification 4.6.A.2(f). *

HSI-17 (27, 37) *
HSI-61 (62, 63) *
LSI 12 (22, 32) *

Basis: The position restrictions on the loop isolation valves, safety injection header isolation valves, and the safety injection tank isolation valves are necessary to assure that plant operation is restricted to conditions considered in the loss-of-coolant accident analysis.

The exception with respect to valves RC-M-21 and RC-M-22 ensures that loop two can be isolated rapidly following a postulated plant shutdown necessitated by degradation at the loop two reactor coolant pump seals.

The restrictions on the ECCS check valves are necessary to assure * that two barriers between interfacing systems are maintained during * plant operation. *

4.6 PERIODIC TESTING

SAFETY INJECTION AND CONTAINMENT SPRAY SYSTEMS
STEAM GENERATOR AUXILIARY FEED PUMPS
MAIN STEAM EXCESS FLOW CHECK VALVES

Applicability: Applies to the safety injection system, the containment spray system, chemical injection system, the containment cooling system, the auxiliary feedwater system, and the main steam excess flow check valves.

Objective: To verify that the subject systems will respond promptly and perform their intended functions, if required.

Specification:

A. SAFETY INJECTION AND CONTAINMENT SPRAY SYSTEMS

1. The following tests will be performed monthly whenever plant conditions are as defined in Section 3.6.A of these Specifications.

   a. Emergency Core Cooling System (ECCS) pumps:

      Both operable high pressure safety injection (HPSI) pumps shall be tested by operating in the charging mode.

      Both operable low pressure safety injection (LPSI) pumps and both operable containment spray (CS) pumps shall be tested by operating in the recirculation mode.

      Acceptable performance shall be that pumps attain rated heads, operate for at least 15 minutes, and that the associated instrumentation and controls function properly.

   b. ECCS Valves:

      All automatically operated valves that are required to operate to assure core flooding, or containment spray shall be exercised. The volume control tank (VCT) outlet to charging pump suction valves shall be exercised through part travel and all other valves shall be visually checked to verify proper operating position.

2. The following tests will be performed at each refueling interval:

   a. ECCS Pumps:

      One HPSI pump shall be flow tested at 1000 psig discharge head.

      One LPSI pump and one CS pump shall be flow tested at 100 psi discharge head.

      During these tests flow distribution thru the HPSI and LPSI flow orifices will be checked.

      Acceptable performance shall be that the pumps and orifices attain flow values used in the safety analysis.

Alternate pumps will be tested at each refueling interval, so that all pumps will be tested within any five year period.

b. ECCS Valves:

All automatically operated valves and the motor operated fill header root valves shall be exercised through their full travel in conjunction with the actuation signal testing set forth in Table 4.1-2 of Technical Specifications.

c. Safety Injection Tanks:

Each safety injection tank will be flow tested by opening the tank isolation valve sufficient to verify check valve operation.

d. The correct position of each electrical and mechanical position stop for the following throttle valves shall be verified:

1) Within 4 hours following completion of maintenance on the valve when the HPSI system is required to be operable.

2) At least once per 4 months

Valve Numbers

HSI-M-11
HSI-M-12
HSI-M-21
HSI-M-22
HSI-M-31
HSI-M-32

e. A flow balance test, as described in 4.6.A.2 above, shall be performed during shutdown to confirm the injection flow rates assumed in the Safety Analysis following completion of HPSI or LPSI system modifications that alter system flow characteristics.

f. ECCS Check Valves *

The leakage flow shall be determined to verify the integrity of the following check valves: *

HSI-17	LSI-12	*
HSI-27	LSI-22	*
HSI-37	LSI-32	*
HSI-61		*
HSI-62		*
HSI-63		*

The HSI 17, (27, 37) and HSI 61 (62, 63) check valves shall be determined to be intact if the accumulated flow through both valves in series is less than or equal to 15 gpm. *

The LSI-12 (22, 32) check valve shall be determined to be intact if the leakage flow is less than or equal to 15 gpm. *

3. Containment Spray Headers:

The containment spray flow nozzles will be tested every five years. The test will consist of pressurizing the headers with air and verifying that the nozzles are free of obstruction.

4. Containment Isolation Valves:

Where practicable, each containment isolation valve shall be stroked to the position required to fulfill its safety function every three months. Those valves that cannot be tested without possible adverse effects during plant operation shall be tested during each cold shutdown if not tested during the previous three months.

B. STEAM GENERATOR AUXILIARY FEED PUMPS

Prior to plant startup following an extended cold shutdown, a flow test will be performed to verify the normal flow path from the demineralized water storage tank to the steam generators. The flow test will be conducted with the AFW system valves in their normal alignment.

Monthly inspections shall be performed to verify that all manual valves in the AFW system necessary to assure flow from the primary water source to the steam generators are locked in the proper position.

During normal plant operation, each auxiliary feed pump shall be tested at quarterly intervals to demonstrate operability of pumps, system valves and instrumentation.

C. MAIN STEAM EXCESS FLOW CHECK VALVES

The main steam excess flow check valves shall be tested once every 6 weeks for movement of the valve disc through a distance of approximately one and one-half inches. These valves will be tested through full travel distance during each refueling interval.

Basis:

The safety injection system and the containment spray system are principal plant safeguards systems that are normally operable during reactor operation.

Complete system tests cannot be performed when the reactor is operating because of their inter-relation with operating systems. The method of assuring operability of these systems is a combination of complete system tests performed during refueling shutdowns and monthly tests of active system components (pumps and valves) which can be performed during reactor operation. The test interval is based on the judgment that more frequent testing would not significantly increase the reliability (i.e., the probability that the component would operate when required), yet more frequent tests would result in increased wear over a long period of time.

The monthly part travel exercising of the VCT outlet to charging pump suction valves, in lieu of the full travel exercise, is conducted to preclude an interruption of normal plant operations. Redundant valves have been used to assure proper lineup in the event of ECCS actuation.

Other ECCS valves whose operation is not required to assure core flooding or containment spray shall be tested during each refueling shutdown period in accordance with 2.b.

The inspection of the leakage flow through the ECCS check valves during each refueling reduces the concern that one valve failure out of two check valves in series may go undetected for an indefinite period of time. This ensures that two barriers between interfacing systems are maintained during plant operation. *

The leakage flow of 15 gpm through the ECCS check valves is small enough to maintain integrity of the valves and is also small enough to allow measurement under the testing program. *

Verification that the spray piping and nozzles are open will be made initially by a suitably sensitive method, and at least every five years thereafter. Since all piping material is all stainless steel, normally in a dry condition, and with no plugging mechanism available, the retest every five years is considered to be more than adequate.

Other systems that are important to the emergency cooling function are the SI tanks, the component cooling system and the service water system. The SI tanks are a passive safety feature. In accordance with the Specification 4.1 (Table 4.1-2, Item 11), the water volume and pressure in the SI tanks are checked periodically. The component cooling and service water systems operate when the reactor is in operation and are continously monitored for satisfactory performance.

The three month testing interval of the steam generator auxiliary feed pumps verifies their operability by recirculating water to the demineralized water tank.

Prior to plant startup following an extended cold shutdown, a flow test is performed on the Auxiliary Feedwater System to functionally verify the system alignment from the demineralized water storage tank to the steam generators.

Monthly inspections are performed to verify that all manual valves in the Auxiliary Feedwater System from the primary water source to the steam generators are locked in the proper position.

Proper functioning of the steam turbine admission valve and starting of the auxiliary feed pump will demonstrate the operability of the steam driven pump. Verification of correct operation will be made both from instrumentation with the main control room and direct visual observation of the pumps.

The main steam, excess flow check valves serve to limit an excessive reactor coolant system cooldown rate and resultat reactivity insertion following a main steam break incident. Their freedom to move will be verified periodically.

Specification

3.19

(Alternative)

3.19 SAFETY INJECTION SYSTEM

Applicability: Applies to the condition of safety injection system.

Objective: To define the condition of the safety injection system required during reactor operation.

Specification:

a) None of the following valves may be closed unless the reactor is subcritical:

1. Any safety injection tank isolation valve (SIA-M-11, 21, 31)
2. Any safety injection header isolation valve (HSI-[illegible]6, 26, 36)
3. Any loop isolation valve (RCM-11, 12, 21, 22, 31, 32)

b) The reactor shall not be critical unless the following conditions are met:

1. The safety injection tank isolation valves shall be disabled in the open position. This shall require the following: *
   a. The breakers shall be locked and tagged open. *
   b. The disconnect switches for each valve power operator shall be locked and tagged open. *
2. The loop isolation valves shall be disabled in the open position. This shall require the following: *
   a. The breakers shall be locked and tagged open. *
   b. The disconnect switches for each valve power operator shall be locked and tagged open. *
3. The following ECCS check valves shall have been determined to be intact in accordance with Technical Specification 4.6.A.2(f). *

   HSI-17 (27, 37) *
   HSI-61 (62, 63) *
   LSI 12 (22, 32) *

Basis: The position restrictions on the loop isolation valves, safety injection header isolation valves, and the safety injection tank isolation valves are necessary to assure that plant operation is restricted to conditions considered in the loss-of-coolant accident analysis.

The restrictions on the ECCS check valves are necessary to assure that two barriers between interfacing systems are maintained during plant operation. *