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ENCLOSURE

Addl info concerning containment vessel isolation systems & tests & inspections.......

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NOTE: THIS MATERIAL WILL BE INCLUDED IN REV # 27 of the FSAR....

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March 3, 1977

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RECEIVED MAR 4 1977 U.S. NUCLEAR REGULATORY COMMISSION Mail Section

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr Stolz:

The Davis-Besse Unit 1 FSAR Sections 6.2.4 entitled "Containment Vessel Isolation Systems" (including Table 6-8) and 6.3.4 entitled "Tests and Inspections" have been updated so that the Davis-Besse Unit 1 Technical Specifications will be consistent with the latest docketed information. These updated sections will be included in Revision 27 of the FSAR.

Yours very truly,

Lowell E Roe

Enclosures:
Davis-Besse Unit 1 FSAR Section 6.2.4 including Table 6-8
Davis-Besse Unit 1 FSAR Section 6.3.4

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6.2.4 CONTAINMENT VESSEL ISOLATION SYSTEMS

6.2.4.1 Design Bases

The general design bases governing isolation valve requirements for containment piping penetrations are as indicated in the following paragraphs.

Leakage through all penetrations not serving accident-consequence-limiting systems is minimized by a double barrier so that no single, credible failure or malfunction of an active component can result in loss-of-isolation. The installed double barriers take the form of closed piping systems, both inside and outside the containment, and various types of isolation valves.

Containment vessel isolation valves are provided in lines penetrating the containment vessel to ensure that no uncontrolled release of radioactivity from the containment can occur, particularly following a radiation release type accident.

Containment vessel isolation occurs on a safety features actuation signal. Development of the instrumentation circuits and signals is presented in table 7-5.

The isolation system closes all penetrations not required for operation of the engineered safety features system. In addition, all pneumatically operated isolation valves, with the exception of those that are part of the engineered safety features, will fail closed. All motor-operated isolation valves, upon loss of normal and reserve electric power, are supplied with power from the emergency power system. Motor-operated isolation valves also have a manual override to be used in case of motor operator failure.

Isolation valves located outside the containment vessel are located as close to the containment vessel as practical. Upon loss of actuating power, the isolation valves are designed to maintain their present position or to take the position that provides the greater safety. 3

All remotely operated containment isolation valves are provided with control and safety features actuation signal block switches and position indicating lights in the control room.

To ensure the added reliability of containment integrity, the following penetration systems are designed in accordance with the ASME Code, Section III, Class 2, designed and analyzed as seismic class I, protected against missiles and all high energy piping, suitably restrained so that passive failure of one component does not damage adjacent components, and subjected to strict quality assurance program to ensure that material and workmanship meet specifications: 3

a. All piping between the inside and outside isolation valves up to and including the valves.

b. In a closed system having only one isolation valve outside the containment, the entire system inside the containment to and including the isolation valve.

The design of the containment isolation system conforms to AEC General Design Citeria No. 54, 55, 56 and 57 and AEC Safety Guide No. 11 with the exceptions indicated in subsection 6.2.4.2. 3

6.2.4.2 System Design

Piping penetrations which require isolation after an accident are classified as follows:

Type I. Each line that is part of the reactor coolant pressure boundary and that penetrates the containment vessel is provided with containment isolation valves as follows:

a. One locked closed isolation valve inside and one locked closed isolation valve outside the containment; or

b. One automatic isolation valve inside and one locked closed isolation valve outside containment; or

c. One locked closed isolation valve inside and automatic isolation valve outside the containment (checkvalves are not used outside the containment as isolation valves); or

d. One automatic isolation valve inside and one automatic isolation valve outside containment. (Check valves are not used outside containment as isolation valves.)

All welds in this type of penetration are subject to periodic inservice inspection in accordance with the requirements of the ASME Code, Section XI.

<u>Type II.</u> Each line that connects directly to the containment vessel atmosphere is provided with isolation valves as follows:

a. One locked closed isolation valve inside and one locked closed isolation valve outside containment; or

b. One automatic isolation valve inside and one locked closed isolation valve outside containment; or

c. One locked closed isolation valve inside and one automatic isolation valve outside the containment (check valves are not used outside containment as isolation valves); or

d. One automatic isolation valve inside and one automatic isolation valve outside containment. (Check valves are not used outside containment as isolation valves.)

e. One blind flange inside the containment and one blind flange outside. 9

Those lines which do not normally connect directly to the containment atmosphere, but may fail following a seismic event are considered to be Type II. This consideration is applied to Penetrations 12, 16, 21, 41, 42-A, 43-A, 44-B, 48, and 68-A. 27

The following penetrations are exceptions to AEC Criterion 56 as described above:

1. Containment vessel vacuum breakers.

3

2. Containment vessel leak test inlet line. 4

3. Fuel transfer tubes.

4. Containment vessel differential pressure sensors. 19

5. Containment vessel hydrogen purge outlet lines. 3

6. Chemical cleaning line.

The above exceptions do not present a hazard to the public or safe operation for the following reasons:

1. Each containment vacuum breaker has one motor-operated isolation valve and one check valve attached outside the containment vessel between the vessel and the shield building. These two valves provide a double barrier complying essentially to AEC Criterion 56. The outside installation of the vacuum breaker facilitates periodic inspection, leak testing, and setting of the vacuum breakers while the station is in operation. 27

27

2. The containment leak test inlet line is locked closed during station operation and is only open at station shutdown when containment leak testing is performed. There is one locked closed isolation valve outside the containment and, in addition, the pipe ends inside and outside the containment are fitted with blind flanges. 4
This provides a double barrier.

3. Each fuel transfer tube has one blind flange with a double O-ring 27
seal installed on the inside of the containment vessel. This provides 20
a double barrier. The outboard valve is not considered part of the containment boundary.

4. Each containment vessel differential pressure sensor has one
normally open remote manually (activation from low radiation 27
area) operated valve outside of the containment. Beyond this 3
valve, 3/8 inch dia. tubing is run to the pressure transmitter which provides a barrier to the containment. All components of this system are designed in accordance with the requirements of the ASME Code, Section III, Class 2, designed as seismic class I, protected against missiles, and are under a strict quality assurance program to ensure that material and workmanship meet specifications. These sensor systems satisfy the requirements
of AEC Safety Guide No. 11. 27

5. The containment vessel hydrogen purge outlet line has double isolation valves provided outside containment for redundant isolation of the flow path. The maximum operating conditions (LOCA) and seismic loading will cause stresses much below the allowable stresses of the penetration system. In addition, operation of this system is required only after the pressure-temperature conditions of a LOCA have been substantially reduced.

These valves have been located outside to make the system more
reliable. These are not required to be open until six to 3
eight weeks (if at all required then) after LOCA. Although the valves are designed to be operable under LOCA conditions, one hundred percent assurance cannot be given that a valve, if installed in the containment vessel, will open when required after such a prolonged closure under post-LOCA environment. By bringing the valve outside containment it can be manually opened if it fails to open automatically.

6. The chemical cleaning line is required for steam generator secondary side cleaning. One blind flange is installed inside and one outside the containment vessel to provide a double barrier. This penetration will be open only during station shutdown.

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<u>Type III</u>. Each line that penetrates the reactor containment vessel and is neither part of the reactor coolant pressure boundary nor connected directly to the containment vessel astmosphere has at least one containment isolation valve, which is either automatic, locked closed or capable of remote manual operation. Check valves are not used as automatic isolation valves outside the containment.

The main steam and main feedwater pipe penetrations have guard pipes installed around the penetrating process pipes to protect the containment vessel against jet effects in case of pipe failure.

<u>Type IV.</u> Each line that serves the engineered safety features systems and penetrates the containment vessel is provided with isolation valves as follows:

a. One automatic isolation valve inside and one automatic isolation valve outside containment (check valves are not used as isolation valves outside containment); or

b. One automatic isolation valve outside containment. Check valves are not used as isolation valves outside containment.

These isolation valves are automatically operated by the safety features actuation signal or remotely from the control room.

Depending on function, all components of the systems outside the containment and beyond the outside containment isolation valve, up to and including the normally closed system block valves, are designed in accordance with the requirements of the ASME Code, Section III, Class 2 or Class 3, designed and analyzed as seismic Class I and protected against missiles. All high energy piping is suitably restrained, so that passive fail- 3
ure on one component does not damage adjacent components. A strict quality assurance program is applied to ensure that material and workmanship meet specifications.

The following penetrations are exceptions to this category:

1. The containment vessel emergency sump recirculation lines are opened by the SFAS during emergencies when the BWST level is low. Although they are open to the containment vessel atmosphere, 27
outside of the containment they form a closed loop system termination inside the containment vessel. All components of the closed loop system are in accordance with the ASME Code, as per table 3-2, designed and analyzed as seismic class I, protected from damage by missiles, and under a strict quality assurance program to ensure that material and workmanship meet specifications.

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2. The decay heat pump suction line is normally closed, but is used post-LOCA for boron dilution, thereby providing an engineered safety feature function. The isolation valves inside the containment are remote manual valve DH-11, manual (locked closed) valve DH-23, and relief valve PSV-4849. This line forms a closed loop outside the containment and terminates inside the containment vessel. All components of the closed loop system are Class 2, designed and analyzed as seismic Class I, protected from missiles and under a strict quality assurance program. The design temperature and pressure rating exceed that of the containment. The relief valve set point is greater than 1.5 times the containment design pressure. At all times, after a LOCA, there 27 will be a water seal from either the BWST or (upon recirculation) the emergency sump to ensure that there is no path for leakage from the containment atmosphere backwards through the relief valve.

3. The containment pressure sensors penetration design is as indicated for Item 4 under Type II penetrations.

Additionally, there are various arrangements in each of these major groups. The individual system flow diagrams show the manner in which each containment vessel isolation valve arrangement fits into its respective system. For convenience, each different valve arrangement is shown in table 6-8 and figure 6-12.

Listed are the modes of actuation, the types of valves, their normal and emergency positions, and closing times. The specific system penetrations to which each of these arrangements is applied are also presented.

Criteria for establishing closure times for normally open isolation valves are such that the requirements of containment integrity are met prior to peak containment pressure and temperature for the largest credible pipe rupture. The normally closed valves will receive a closure signal to close them if they are open, otherwise the signal serves as a "make-sure signal."

The containment isolation system and all of its components, including piping, valves, supports, etc., are designed in such a manner that dynamic forces resulting from inadvertent sudden opening or closure of a valve under operating conditions will not result in loss of containment integrity. In addition, automatic controls are provided on the double isolation valves on the normal decay heat removal system to prevent inadvertent opening of these valves and overpressurization of the decay heat removal system. A detailed description of thise interlock system is in section 7.6.1.1.

If a main steam isolation valve closes suddenly during normal station operation, increased steam system pressure will cause the code safety valves to open.

Table 6-8

Containment Vessel Isolation Valve Arrangements

Penetration Number	Service	Flow Direction	Valve Arrangement	Number of Isolation Valves	Type	Signal Note 1	Normal Valve Position	CIS Position	Closing/Opening Time ***	27
1	Pressurizer Sample Line	Out		2	I	SA	Closed	Closed	30 sec.	3 3
2	Steam Generator Secondary Water Sample Line	Out		1	III	SA	Open	Closed	10 sec.	3 13
3	Component Cooling Water Inlet Line	In		2	III	SA	Open	Closed	15 sec.	27
4	Component Cooling Water Outlet Line	Out		2	III	SA	Open	Closed	15 sec.	27
5, 6, 7	Containment Air Cooling Units Service Water Inlet Lines	In		1	IV	SA	Open	Open	--	3 22
8 A-J	Containment Vessel Vacuum Breakers	In	Shown on Figure 6-12	1	II	SA	Open	Closed	15 sec.	27
9, 10, 11	Containment Air Cooling Units Service Water Outlet Lines	Out		1	IV	SA	Open	Open	--	3 25
12	Component Cooling Water Supply to Control Rod Drive Mechanisms	In		2	II	SA	Open	Closed	15 Sec.	3 7
13	Containment Vessel Normal Sump Drain	Out		2	II	SA	Open	Closed	15 sec.	27
#14	Letdown Line to Purification Demineralizers	Out		2	I	SA	Open	Closed	15 sec.	3
15	Spare									
16	Containment Vessel Equipment Vent Header	Out		2	II	SA	Open	Closed	10 sec.	
17	Containment Vessel Leak Test Inlet Line	In		Blind Flange	II	Local Manual	Locked Closed	Locked Closed	-	25

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Table 6-8 (Cont'd)

Containment Vessel Isolation Valve Arrangements

Penetration Number	Service	Flow Direction	Valve Arrangement	Number of Isolation Valves	Type	Signal	Normal Valve Position	CIS Position	Closing/Opening Time ***	27
18	Steam Generator Secondary Water Sample Line	Out	Shown on Figure 6-12	1	III	SA	Open	Closed	10 sec.	3
19	High Pressure Injection Line	In		3	IV	SA	Closed/Open	Open/Closed	15 sec.	3 27
20, 22	High Pressure Injection Lines	In		2	IV	SA	Closed	Open	15 sec.	
21	Demineralized Water Supply Line	In		2	II	SA	Open	Closed	10 sec.	3
23, 24	Fuel Transfer Tube	In, Out		Blind Flange	II	Manual	Closed	Closed	--	20
25, 26	Containment Spray Lines	In		1	IV	SA/Manual	Closed	Open	35 sec/---	21
27, 28	Low Pressure Injection Lines	In		2	IV	Remote Manual	Open	Open	---	17 27
29	Decay Heat Pump Suction Line	Out		3	IV	Remote Manual and Manual	Closed	Closed	---	3 25
30, 31	Containment Vessel Emergency Sump Recirculation Lines	Out		1	IV	SA	Closed	*Closed	---	D-B
32	Reactor Coolant System Drain Line to R.C. Drain Tank	Out		2	I	SA	Open	Closed	10 sec.	22
33	Containment Vessel Purge Inlet Line	In		2	II	SA	Closed	Closed	10 sec.	
34	Containment Vessel Purge Outlet Line	Out		2	II	SA	Closed	Closed	10 sec.	
35, 36	Auxiliary Feed Water Lines	In		1	III	Remote Manual	Open	Open	---	3 16 27
37, 38	Main Feedwater Lines	In		1	III	SA	Open	Closed	15 sec.	3 13
**39, 40	Main Steam Lines	Out		1	III	SA	Open	Closed	10 sec.	
41	Pressurizer Quench Tank Circulating Inlet Line	In		2	II	SA	Open	Closed	10 sec.	
42-B	Containment Vessel Air Sample Return	In		2	II	SA	Open	Closed	15 sec.	3 25 27

Table 6-8 (Cont'd)

Containment Vessel Isolation Valve Arrangements

Penetration Number	Service	Flow Direction	Valve Arrangements	Number of Isolation Valves	Type	Signal	Normal Valve Position	CIS Position	Closing/Opening Time ***
42-A	Service Air Supply Line	In		2	II	SA	Open	Closed	10 sec
43-A	Instrument Air Supply Line	In		2	II	SA	Open	Closed	10 sec.
43-B	Containment Vessel Air Sample Return	In		2	II	SA	Open	Closed	15 sec.
44-A	Core Flooding Tank Fill and Nitrogen Supply Lines	In		2	III	SA	Closed	Closed	10 sec.
44-B	Pressurizer Quench Tank Nitrogen Supply Line	In		2	II	SA	Open	Closed	10 sec.
45	Spare								
46	Spare								
47-A	Core Flooding Tank Sample Line	Out	Shown on Figure 6-12	3	III	SA/Remote Manual	Closed	Closed	10 sec/---
47-B	Core Flooding Tank Vent Line	Out		3	III	SA/Remote Manual	Closed	Closed	10 sec/---
48	Pressurizer Quench Tank Circulating Outlet Line	Out		2	II	SA	Open	Closed	10 sec.
49	Refueling Canal Fill Line	In/Out		2	II	Manual	Locked Closed	Locked Closed	--
50	High Pressure Injection Line	In		2	IV	SA	Closed	Open	15 sec.
51	Hydrogen Purge System Exhaust	Out		2	II	SA	Closed	Closed	60 sec.
52, 53, 54, 55	Reactor Coolant Pump Seal Water Supply	In		2	I	SA	Open	Closed	12 sec.
56	Reactor Coolant Pump Seal Water Return	Out		5	I	SA	Open	Closed	30 sec.
57, 58	Steam Generator Drain Lines	Out		2	III	Remote Manual & Local Manual	Closed	Closed	--
59	Secondary Side Chemical Cleaning	In/Out		Blind Flange	II	Manual	Closed	Closed	
60, 61, 62	Spare								
63, 64, 65, 66	Spare								

Table 6-8 (Cont'd)

Containment Vessel Isolation Valve Arrangements

Penetration Number	Service	Flow Direction	Valve Arrangement	Number of Isolation Valves	Type	Signal	Normal Valve Position	CIS Position	Closing/Opening Time ***	Rev.
67	Hydrogen Dilution System Supply	In	Shown on Figure 6-12	2	II	SA	Closed	Closed	60 sec.	3, 27
68-A	Pressurizer Quench Tank Sample	Out		2	II	SA	Closed	Closed	30 sec.	3
68-B	Containment Air Sample	Out		2	II	SA	Open	Closed	15 sec.	3, 15, 27
69	Hydrogen Dilution System Supply	In		2	II	SA	Closed	Closed	60 sec.	3, 27
70	Spare									
71-A	Containment Pressure Sensor	Out		1	IV	Remote Manual	Open	Open	--	3
71-B	Containment Air Sample	Out		2	II	SA	Open	Closed	15 sec.	3, 27
71-C	Core Flooding Tank N_2 Fill Line	In		2	III	SA	Closed	Closed	10 sec.	3
72-A	Containment Pressure Sensor	Out		1	IV	Remote Manual	Open	Open	--	3, 27
72-B	Spare									15, D-3
72-C	Containment Pressure Differential Transmitter	Out		1	II	Remote Manual	Open	Open	--	3, 27
73-A	Containment Pressure Sensor	Out		1	IV	Remote Manual	Open	Open	--	22, 3
73-B	Containment Air Sample	Out		2	II	SA	Open	Closed	15 sec.	3, 19, 27
73-C	Containment Pressure Differential Transmitter	Out		1	II	Remote Manual	Open	Open	--	3
74-A	Containment Pressure Sensor	Out		1	IV	Remote Manual	Open	Open	--	3
74-B	Containment Air Sample	Out		2	II	SA	Open	Closed	15 sec.	3, 27
74-C	Pressurizer Auxiliary Spray	In		2	I	Remote Manual	Closed	Closed	---	
75, 76, 77, 78, 79	Spare									
80	Emergency Lock	See Chapter 3 for description and arrangement.								
81	Personnel Lock	See Chapter 3 for description and arrangement.								
82	Equipment Hatch	See Chapter 3 for description and arrangement.								

Table 6-8 (Cont'd)

Containment Vessel Isolation Valve Arrangements

Penetration Number	Service	Flow Direction	Valve Arrangement	Number of Isolation Valves	Type	Signal	Normal Valve Position	CIS Position	Closing/Opening Time ***
101	Electrical Penetrations								
102	Electrical Penetrations								

* Valve is normally closed and will stay closed on containment isolation signal. When level drops in borated water storage tank, valve opens. 13

** Each main steam line also contains the following isolation valves which are upstream of the main isolation valve: code safety valves, atmospheric vent valve, main steam high-point vent valve, startup drain valve, and main isolation valve. The response time for the main isolation valve is 5 seconds and for the main isolation valve bypass valve (normally closed) is 10 seconds. The auxiliary feed pump turbine valve is a remote, manually operated isolation valve. 22 20 17 23 27 3

Note 1. SA signal denotes safety features actuation signal.

*** No diesel start and sequence delays, or SA signal response times included.

\# Response time for the MOV inside containment is 15 seconds; for the pneumatic valve outside containment it is 10 seconds. 27

\## Response time for the MOV's inside containment is 30 seconds; for the pneumatic valve outside containment it is 12 seconds.

6.3.4 TESTS AND INSPECTIONS

Portions of the emergency core cooling system are not normally operating. In order to affirm that the normally idle emergency equipment is in a state of readiness to operate in the event of an accident, periodic tests are conducted which verify the operability and function of that equipment.

In order to verify that the emergency core cooling system functions as designed, periodic system tests and periodic component tests are performed.

During each refueling interval, the core flooding system, the high pressure injection system and the low pressure injection system are tested. Each system is tested by itself and it is evaluated so that the system's emergency core cooling functional requirements are confirmed to be fulfilled.

The test on the core flooding system is performed while the RC system is being depressurized. As the RC system pressure is being reduced through
675 psig, an alarm annunciates in the control room signifying that the core 17
flooding isolation valves are open at too low a RC system pressure. The RC system continues to be depressurized through 600 psig and the levels in the core flooding tanks are observed. As the RC system pressure gradually decreases below 600 psig, the level in each of the core flooding tanks begins to decrease. The drop in level indicates that the flow path of the core flooding water from the core flooding tank through the isolation valve and the two check valves into the reactor vessel is open. After the core flooding tank levels have dropped approximately five inches, the core flooding tank isolation valves are closed. The core flooding system test is acceptable when the core flooding tank levels have decreased the five inches in accordance with the RC system pressure change. The reason for the level changes being considered indicative of system performance under accident conditions is that the core flooding system is passive in nature and that the differential pressure across the core flooding check valves is in actuality the device which causes the system to operate. Since the tank level range indicates that fluid has passed from the tank into the connected piping (the reactor vessel) the level change is considered to be firm basis for test acceptability.

The test of the high pressure injection system is performed when the reactor is shut down for normal refueling. One train of the equipment which would be called upon to operate in the event of an SA actuation accident is tested
with the HPI pump motor breaker in the test position and an SA signal applied 3
to the HPI pump motor breaker and the HPI valves which are required to move at the initiation of the accident. Each of these devices is considered to have operated satisfactorily when it obeys the SA signal as noted. The test is considered to be acceptable when the devices requiring active
motion obey their respective SA signals within the specified time interval. 27
The valves which are required to move are to be in their safety position
within 30 seconds. Quarterly, the HPI pumps will be tested in a recircula- 3
tion mode to the BWST to assure the capability of the pumps to perform
their SFAS function as verified by pumps reaching and maintaining a 3
specified point on their head-capacity curves; also those applicable valves, as per ASME Section XI, in the HPI system which are required to move will be stroked quarterly to verify their capability to function.

Once per 31 days, each valve (manual, power-operated, or automatic) in the flow path that is not secured in position is verified to be in its correct position. 27

The positions of the valves are monitored by the valve position lights in the control room. The status of the pumps is monitored by the status indicating lights and the station computer. The HPI flow is monitored by the flow indicators and alarms by the station computer and annunciator. 3

The system test of the low pressure injection system is performed when the reactor is shut down for normal refueling. One train of the equipment which would be called upon to operate in the event of SA actuating accident is tested. With the DH pump motor signal breaker in this test position of SA signal is applied to the DH pump motor breaker and the LPI system valves which are required to move at the initiation of the accident. Each of these devices is considered to have operated satisfactorily when it obeys the signal as noted. The test is considered to be acceptable when the devices requiring active motion obey their respective SA signal within the specified time interval. The valves which are required to move are to be in their safety position within 30 seconds. Quarterly, the decay heat pumps will be 23
tested in a recirculation mode to the BWST to assure the capability of the 27
pumps to perform their SFAS function as verified by pumps reaching 3
and maintaining a specified point on their head-capacity curves. Also, those applicable valves in the LPI system will be stroked quarterly to verify their capability to function.

Once per 31 days each valve (manual, power-operated or automatic) in the flow path, that is not secured in position, is verified to be in its correct position.

The once per fuel cycle testing frequency of the systems related to emergency core cooling is based upon an annual shutdown for refueling frequency. The annual test frequency is considered to be satisfactory. The test is considered to give a demonstration of emergency equipment readiness. The individual active components (those requiring active motion that are not normally in their ESSC position) within the emergency core cooling systems 27
are tested no less frequently than quarterly (13 weeks) to verify that the component is capable of performing its ESF function. The method of conduct- 6 13
ing the test is by manually actuating the component from the control room. The device is considered to have operated acceptably when it goes to its SFAS status. 3 27

The individual components which are tested are listed in table 6-17.

Table 6-17

Component	Procedure and Requirement for Acceptability	Frequency	
HP Inj. Pumps and Injection Valves	Start pumps and open HPI valves via SFAS signal by pushing button on SFAS panel - check status lights and developed head.	Quarterly	14 27
Decay Heat Pumps, LPI Valves and DH Pump Suction Valves	Start Pump and Open valve via SFAS signal by pushing button on SFAS panel - check status lights and developed head.	Quarterly	14
BWST Isolation Valves	Valve is normally open. Close valve via remote manual switch, then open valve via SFAS signal and verify position via position indicating lights.	Quarterly	
HPI System Response Time Test	SA signal applied to HPI pumps and HPI injection valves for that train	Refueling	27
LPI System Response Time Test	SA signal applied to DHR (LPI) pump	Refueling	27
HPI and LPI Valves that are not secured in position	Verify correct position	31 days	27

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6.3.5 INSTRUMENTATION APPLICATION

The instrumentation provisions for various methods of actuation are discussed in Chapter 7. Design details and logic of the instrumentation are discussed in Chapter 7.