

## 2.7.5 Fire Water Distribution System

### Design Description

#### 1.0 System Description

The fire water distribution system (FWDS) is non-safety-related, except for the FWDS containment isolation valves and associated piping which are safety-related. The FWDS is comprised of the following fire water distribution subsystems:

- The FWDS conventional area, which consists of the fire water storage tanks, fire pumps, pump structure, and underground fire main loop.
- The FWDS inside Nuclear Island consists of supply headers and the standpipe and hose system.

The FWDS provides the following safety-related functions:

- The FWDS provides the safety-related function of providing containment isolation of the Reactor Building (RB).

The FWDS provides the following non-safety-related functions:

- The FWDS inside Nuclear Island is an alternate source of makeup water for the spent fuel spray system during a severe accident event.
- The FWDS inside Nuclear Island is an alternate source of makeup water for component cooling water system (CCWS) post seismic event.
- The FWDS inside Nuclear Island is an alternate source of makeup water for secondary side feed and bleed mitigation strategies for an extended loss of AC power (ELAP) event.
- The FWDS inside Nuclear Island is an alternate source of makeup water for the spent fuel pool spray system mitigation strategies for an ELAP event.

#### 2.0 Arrangement

2.1 Deleted.

#### 3.0 Mechanical Design Features

3.1 Deleted.

3.2 Deleted.

3.3 Deleted.

3.4 Deleted.

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- 3.5 Deleted.
- 3.6 Deleted.
- 3.7 Deleted.
- 3.8 Deleted.
- 3.9 Deleted.
- 3.10 Deleted.
- 3.11 Deleted.
- 3.12 Deleted.
- 4.0 I&C Design Features, Displays, and Controls**
- 4.1 Deleted.
- 4.2 Deleted.
- 4.3 Deleted.
- 4.4 The location of the FWDS equipment is consistent with the post-fire safe shutdown analysis.
- 5.0 Electrical Power Design Features**
- 5.1 Deleted.
- 5.2 Deleted.
- 6.0 Environmental Qualifications**
- 6.1 Deleted.
- 7.0 Equipment and System Performance**
- 7.1 The FWDS includes two separate fire water storage tanks.
- 7.2 The FWDS pumps consist of at least one 100% capacity electric motor-driven pump and two 100% capacity diesel engine-driven pumps.
- 7.3 FWDS pumps have net positive suction head available (NPSHA) that is greater than net positive suction head required (NPSHR) at system run-out flow.
- 7.4 Deleted.
- 7.5 The FWDS has provisions to allow flow testing of the FWDS pumps during plant operation.

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- 7.6 Deleted.
- 7.7 The standpipe and hose systems in areas containing systems and components required for safe plant shutdown in the event of a safe shutdown earthquake (SSE), including the water supply to these standpipes, are capable of remaining functional and supplying two hose stations following an SSE.

## **8.0 Interface Requirements**

- 8.1 The raw water supply system (RWSS) delivers makeup water to the FWDS fire water storage tanks.

### **Inspections, Tests, Analyses, and Acceptance Criteria**

Table 2.7.5-3 lists the FWDS ITAAC.

**Table 2.7.5-1—Deleted**

**Table 2.7.5-2—Deleted**

**Table 2.7.5-3—Fire Water Distribution System ITAAC**  
**Sheet 1 of 2**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	Deleted.	Deleted.	Deleted.
3.1	Deleted.	Deleted.	Deleted.
3.2	Deleted.	Deleted.	Deleted.
3.3	Deleted.	Deleted.	Deleted.
3.4	Deleted.	Deleted.	Deleted.
3.5	Deleted.	Deleted.	Deleted.
3.6	Deleted.	Deleted.	Deleted.
3.7	Deleted.	Deleted.	Deleted.
3.8	Deleted.	Deleted.	Deleted.
3.9	Deleted.	Deleted.	Deleted.
3.10	Deleted.	Deleted.	Deleted.
3.11	Deleted.	Deleted.	Deleted.
3.12	Deleted.	Deleted.	Deleted.
4.1	Deleted.	Deleted.	Deleted.
4.2	Deleted.	Deleted.	Deleted.
4.3	Deleted.	Deleted.	Deleted.
4.4	The location of the FWDS equipment is consistent with the post-fire safe shutdown analysis.	<ul style="list-style-type: none"> <li>a. A post-fire safe shutdown analysis will be performed to determine the location of the FWDS equipment.</li> <li>b. An inspection will be performed to verify that the location of the as-built FDWS equipment is consistent with the post-fire safe shutdown analysis.</li> </ul>	<ul style="list-style-type: none"> <li>a. A post-fire safe shutdown analysis determines the location of the FWDS equipment.</li> <li>b. The FWDS equipment is located consistent with the post-fire safe shutdown analysis.</li> </ul>
5.1	Deleted.	Deleted.	Deleted.
5.2	Deleted.	Deleted.	Deleted.
6.1	Deleted.	Deleted.	Deleted.
7.1	The FWDS includes two separate fire water storage tanks.	An inspection and analysis will be performed to verify the as-built capacity of the fire water storage tanks.	The capacity of each of the two fire water storage tanks is greater than or equal to 300,000 gallons.

**Table 2.7.5-3—Fire Water Distribution System ITAAC  
Sheet 2 of 2**

<b>Commitment Wording</b>		<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
7.2	The FWDS pumps consist of at least one 100% capacity electric motor-driven pump and two 100% capacity diesel engine-driven pumps.	<p>a. An inspection will be performed to verify the as-built FWDS consists of at least one 100% capacity electric motor-driven pump and two 100% capacity diesel engine-driven pumps.</p> <p>b. A test will be performed to verify that each FWDS pump provides 100% of the required flow capacity.</p>	<p>a. The FWDS consists of at least one 100% capacity electric motor-driven pump and two 100% capacity diesel engine-driven pumps.</p> <p>b. A report concludes that each FWDS pump provides 100% of the required flow capacity.</p>
7.3	FWDS pumps have NPSHA that is greater than NPSHR at system run-out flow.	Tests and analyses will be performed to verify pump NPSHA is greater than NPSHR at system run-out flow.	The FWDS pumps have NPSHA that is greater than NPSHR at system run-out flow.
7.4	Deleted.	Deleted.	Deleted.
7.5	The FWDS has provisions to allow flow testing of the FWDS pumps during plant operation.	Tests will be performed to verify FWDS has provisions to allow flow testing of the FWDS pumps during plant operation.	A flow test line allows flow testing of each FWDS pump during plant operation.
7.6	Deleted.	Deleted.	Deleted.
7.7	The standpipe and hose systems in areas containing systems and components required for safe plant shutdown in the event of a SSE, including the water supply to these standpipes, are capable of remaining functional and supplying two hose stations following an SSE.	An analysis will be performed to demonstrate the ability of the as-built standpipe and hose systems in areas containing systems and components required for safe plant shutdown in the event of a SSE to remain functional and supply two hose stations following a SSE.	An analysis concludes the FWDS will remain functional following a SSE and is capable of supplying the two hydraulically most remote hose stations with at least 75 gpm per hose stream.