2.5 Reactor Servicing Equipment

2.5.1 Fuel Servicing Equipment

No entry for this system.

2.5.2 Miscellaneous Servicing Equipment

No entry for this system.

2.5.3 Reactor Pressure Vessel Servicing Equipment

No entry for this system.

2.5.4 RPV Internal Servicing Equipment

No entry for this system.

2.5.5 Refueling Equipment

Design Description

The Reactor Building is supplied with a refueling machine for fuel movement and servicing plus an auxiliary platform for servicing operations from the vessel flange level.

The refueling machine is a gantry crane, which spans the reactor vessel and the storage pools on bedded tracks in the refueling floor. A telescoping mast and grapple suspended from a trolley system is used to lift and orient fuel bundles for placement in the core and/or storage racks. Two auxiliary hoists, one main and one auxiliary monorail trolley-mounted, are provided for in-core servicing. Control of the machine is from an operator station on the refueling floor.

The refueling machine is classified as non-safety-related.

A position indicating system and travel limit computer are provided to locate the grapple over the vessel core and prevent collision with pool obstacles. The mast grapple has a redundant load path so that no single component failure results in a fuel bundle drop. Interlocks on the machine: (1) prevent hoisting a fuel bundle over the vessel unless an all-control-rod-in permissive is present; (2) limit vertical travel of the fuel grapple to provide shielding over the grappled fuel during transit; (3) prevent lifting of fuel without grapple hook engagement and load engagement.

The refueling machine is classified as Seismic Category I.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.5.5 provides a definition of the inspection, test, and/or analyses, together with associated acceptance criteria, which will be undertaken for the refueling machine. No entries are proposed for the auxiliary platform.

Table 2.5.5 Refueling Equipment

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the refueling machine is described in Section 2.5.5.	1. Inspections of the as-built refueling machine will be conducted.	1. The as-built refueling machine conforms with the basic configuration described in Section 2.5.5.
2. Interlocks on the machine: a. Prevent hoisting a fuel bundle over the vessel unless an all-control-rod-in permissive is present. b. Limit vertical travel of the fuel grapple to provide shielding over the grappled fuel during transit. c. Prevent lifting of fuel without grapple hook engagement and load engagement.	2. Tests will be conducted on the as-built refueling machine using simulated signals and loads.	2. Interlocks on the machine: a. Prevent hoisting a fuel bundle over the vessel unless an all-control-rod-in permissive is present. b. Limit vertical travel of the fuel grapple to provide shielding over the grappled fuel during transit. c. Prevent lifting of fuel without grapple hook engagement and load engagement.

2.5.6 Fuel Storage Facility

Design Description

The Fuel Storage Facility provides storage racks for the temporary and long-term storage of new and spent fuel and associated equipment. The new and spent fuel storage racks use the same configuration and prevent inadvertent criticality.

The racks are classified as non-safety-related.

Racks provide storage for spent fuel in the spent fuel storage pool in the Reactor Building. New fuel, 40% of reactor core, is stored in the new fuel storage vault in the Reactor Building. The racks are top loading, with fuel bail extended above the rack. The spent fuel racks have a minimum storage capacity of 270% of the reactor core, which is equivalent to a minimum of 2354 fuel storage positions. The new and spent fuel racks maintain a subcriticality of at least 5% Δk under dry or flooded conditions. The rack arrangement prevents accidental insertion of fuel assemblies between adjacent racks and allows flow to prevent the water from exceeding 100°C.

The racks are classified as Seismic Category I.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.5.6 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the new and spent fuel storage racks.

Table 2.5.6 Fuel Storage Facility

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the new and spent fuel racks is described in Section 2.5.6.	1. Inspections of the as-built system will be conducted	1. The as-built new and spent fuel storage racks conform with the basic configuration described in Section 2.5.6.
2. The new and spent fuel racks maintain a subcriticality of at least 5% Δk under dry or flooded conditions.	2. Analyses will be performed to determine the k_{eff} of the as-built new and spent fuel racks.	2. An analysis report exists which concludes that the new and spent fuel racks have a subcriticality of at least 5%Δk under dry or flooded conditions.
3. The rack arrangement prevents accidental insertion of fuel assemblies between adjacent racks.	3. Inspections of the as-built new and spent fuel racks will be performed.	3. The rack arrangement prevents accidental insertion of fuel assemblies between adjacent racks.
4. The rack arrangement allows flow to prevent the water from exceeding 100°C.	4. An analysis of the as-built spent fuel rack will be performed to determine the maximum water temperature.	4. An analysis report exists which concludes that the rack arrangement allows flow to prevent the water from exceeding 100°C.

2.5.7 Under-Vessel Servicing Equipment

No entry for this system.

2.5.8 CRD Maintenance Facility

No entry for this system.

2.5.9 Internal Pump Maintenance Facility

No entry for this system.

2.5.10 Fuel Cask Cleaning Facility

No entry for this system.

2.5.11 Plant Start-up Test Equipment

No entry for this system.

2.5.12 Inservice Inspection Equipment

No entry for this system.