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2.4.8-201	Layout of Major Plant Facilities

PTN COL 2.4-1

2.4.8 COOLING WATER CANALS AND RESERVOIRS

The design of the AP1000 reactor employs a passive containment cooling system that functions as the safety-related ultimate heat sink. This system is described in DCD Subsection 6.2.2. The passive containment cooling system does not require an open surface water source to perform its safety-related function. There are no safety-related cooling water canals or reservoirs related to the operation of Units 6 & 7.

2.4.8.1 Cooling Water Canals

Units 6 & 7 do not use cooling water canals for normal plant cooling or for emergency cooling. The plant area of Units 6 & 7 is surrounded by an existing industrial wastewater facility/cooling canals, as shown in Figure 2.4.1-203, which performs the cooling function for Units 1 to 4. The cooling canals consist of 168 miles of recirculating canals that occupy an area approximately 5900 acres. The canals are 200 feet wide and are generally shallow with 1 to 3 feet of water depth. The berms on the canals are approximately 90 feet wide. The canals undergo routine maintenance and the removal of aquatic vegetation from the bottom of the canals to minimize flow restriction. The cooling canals receive plant effluents from Units 1 to 4, as well as blowdown flow from the mechanical draft cooling towers of Unit 5, but there is no surface water discharge from the canals to other water bodies. Because the cooling canals are much lower in elevation than 26.0 feet NAVD 88, the design plant grade of Units 6 & 7, it does not cause any flooding concern to the safety-related structures, systems, and components of Units 6 & 7. In addition, there is no reliance of Units 6 & 7 on these existing canals for any plant water use.

2.4.8.2 Makeup Water Reservoirs

The mechanical draft cooling towers, that function as the normal heat sinks for the circulating water system of the main condensers of Units 6 & 7, are designed to operate on two makeup water sources: reclaimed water and saltwater through radial collector wells. Each of the two makeup water sources can independently support full load operation of the station. Reclaimed water is supplied by the Miami-Dade Water and Sewer Department to the FPL reclaimed water facility and is delivered to an onsite makeup water reservoir (MWR) after treatment. Reclaimed water from the reservoir is then transferred to the cooling tower basins via a set of cooling tower makeup pumps when the system is running on

reclaimed water. The MWR has no safety-related function. It provides makeup water inventory to support the continuous operation of the cooling towers for both units. When the cooling towers require makeup water from the radial collector wells, saltwater is transferred directly to the cooling tower basins, bypassing the MWR.

The MWR is made of concrete and is located on the south side of the plant area, as shown in Figure 2.4.8-201.The north side of the reservoir is approximately 2200 feet long, and the south side is approximately 1800 feet long. The bottom elevation of the reservoir is at –2.0 feet NAVD 88, and the top of the concrete walls is at elevation 24.0 feet NAVD 88 with the maximum storage level at elevation 22.5 feet NAVD 88. The six cooling towers, three for each unit and their common open channel flumes, occupy part of the footprint of the MWR as shown in Figure 2.4.8-201.

The MWR is a self-contained reservoir and has no other contributing drainage area and the only other inflow is direct rainfall. Return effluents from the FPL water treatment facility, sanitary waste treatment facility, blowdown from the cooling towers, and miscellaneous clean water drains are directed to the blowdown sump before being discharged into the underground injection wells.

Low flow conditions are presented in Subsection 2.4.11. In conclusion, there is no impact to the safety-related structures, systems, and components as a result of a low water condition in the MWR. Subsection 2.4.4 addresses the effect of potential breaching of the MWR and concludes that safety-related structures are not impacted.

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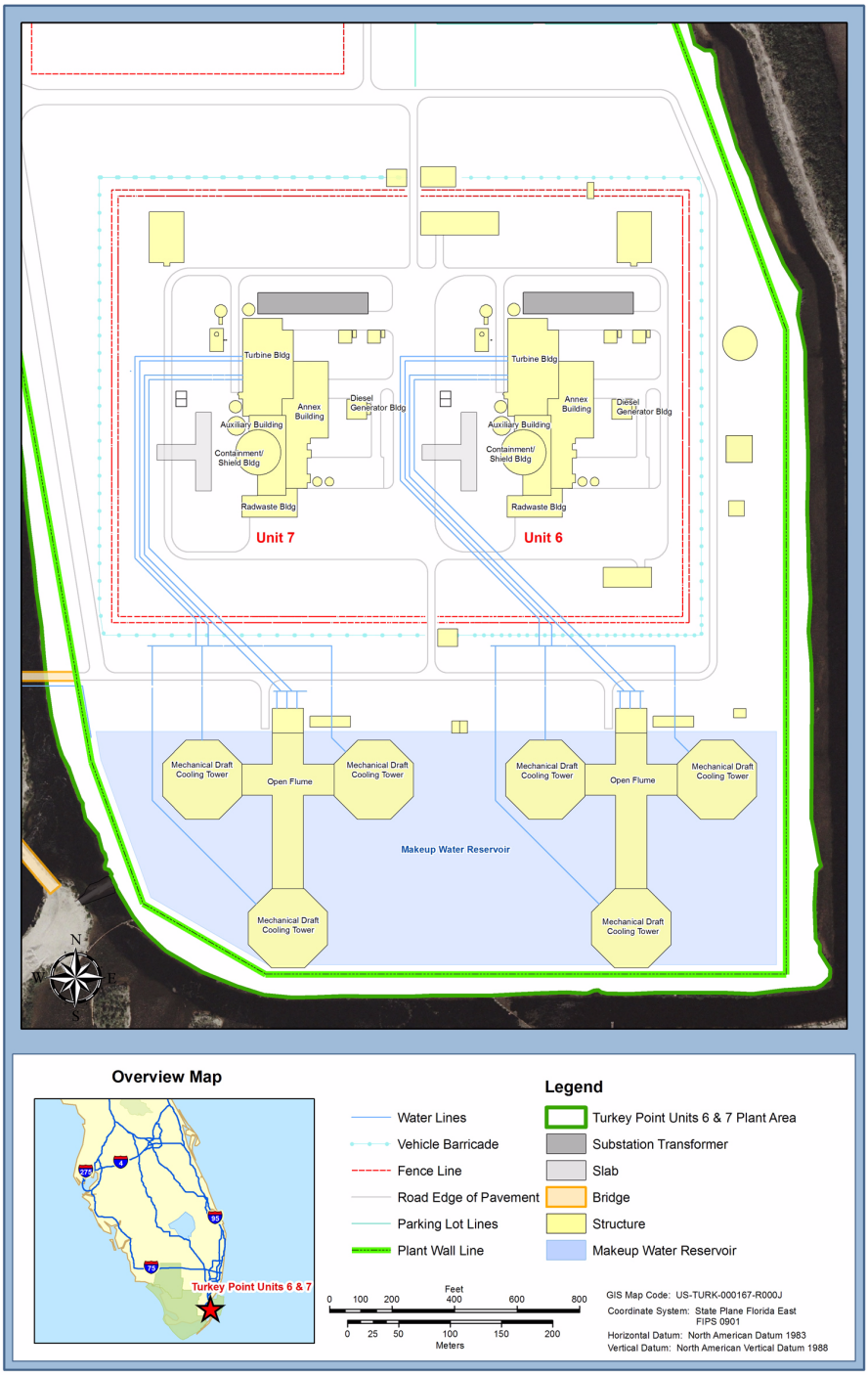
Figure 2.4.8-201 Layout of Major Plant Facilities