

**SUBSECTION 2.4.4: POTENTIAL DAM FAILURES REVISION 7
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2.4.4 POTENTIAL DAM FAILURES

PTN COL 2.4-2

As stated in [Subsection 2.4.3](#), there are no major natural streams or rivers near Units 6 & 7, and, therefore, there are no dams located upstream or downstream of the site. The nearest embankment dam is the Herbert Hoover Dike that surrounds Lake Okeechobee. The dike and lake are located more than 90 miles northwest of Units 6 & 7 ([Reference 201](#)). There is no direct channel or stream path from Lake Okeechobee to Units 6 & 7 ([Reference 201](#)). Any breach of the Herbert Hoover Dike would result in floodwaters from the breach quickly spreading out laterally from the breaching location, as the topography between the lake and Units 6 & 7 is relatively flat. Herbert Hoover Dike Breach Inundation Area maps published in the Unified Local Mitigation Strategy for Palm Beach County, Florida and produced by the U.S. Army Corps of Engineers ([Reference 203](#)) indicate that flooding, as a result of a Herbert Hoover Dike breach, does not extend beyond the drainage canals located along the Palm Beach–Broward County line between Lake Okeechobee and the site. Thus, flood water from a Herbert Hoover Dike breach has no impact on the Units 6 & 7 site.

The Units 6 & 7 concrete water storage reservoir, referred to as the makeup water reservoir, is located in the cooling tower area south of the power block. The top of the reservoir wall is at elevation 24.0 feet NAVD 88, which is 2 feet below the design grade elevation of the safety-related structures. The existing cooling water return canals for Units 1, 2, 3 & 4 surround the reservoir walls on the east, south, and west sides. Any breach that were to occur along these three sides of the reservoir would result in water flowing away from the power block and into the canals, to the Biscayne Bay, or to the low-lying natural topography south and west of Units 6 & 7. Therefore, breaches along these three sides would not pose a flooding risk to the safety-related facilities.

A breach in the makeup water reservoir northern wall results in water flowing toward the power block area. The design grade elevation adjacent to the north wall of the makeup water reservoir is at approximately elevation 22.0 feet NAVD 88. Thus, the reservoir wall extends only 2 feet above grade. The maximum operating water level in the reservoir is approximately elevation 22.5 feet NAVD 88, 1.5 feet below the top of the reservoir. When considering a breach of the northern reservoir wall, the combined events criteria in American National Standards/American Nuclear Society 2.8-1992 ([Reference 202](#)) indicate that a one-half probable maximum flood shall be considered coincidental with a dam breach event. The one-half probable maximum flood for the makeup water reservoir is a result of the one-half probable maximum precipitation (PMP) directly over the reservoir. During a one-half PMP storm event of 27.9 inches over a 72-

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hour period, the makeup water reservoir overflows along all four sides. As presented in [Subsection 2.4.2](#) the full PMP event maximum discharge over the reservoir walls is estimated to be approximately 2696 cubic feet per second (cfs). During a one-half PMP storm event, the peak discharge over the reservoir wall is then estimated to be approximately 1348 cfs. Using the broad crest weir equation with a total wall length of 5717 feet around the four sides of the reservoir and a weir coefficient of 2.6, the maximum water level is 2.4 inches (0.2 foot) above the top of the reservoir wall at elevation 24.0 feet NAVD 88. Thus, the maximum one-half PMP water level in the reservoir is approximately elevation 24.2 feet NAVD 88.

If a breach were to occur in the north wall of the makeup water reservoir during a one-half PMP event, the maximum head during the peak outflow from the reservoir would be approximately 2.2 feet above the finished grade adjacent to north wall of the reservoir at elevation 22.0 feet NAVD 88. With a water level in the reservoir at the time of the breach at elevation 24.2 feet NAVD 88 (i.e., 1.8 feet below the elevation of the safety-related design grade elevation at 26.0 feet NAVD 88), the flood wave from a breach in the north wall of the reservoir does not pose a flooding risk to the safety-related facilities. It should also be noted that there are more than 700 feet between the makeup water reservoir wall and the nearest safety-related building (i.e., the auxiliary building for either Unit 6 or 7).

A detailed dam breach flooding analysis was not performed for Units 6 & 7 because there are no upstream or downstream dams that would pose a flooding potential to Units 6 & 7 and the makeup water reservoir top of wall elevation is lower than the design grade elevation of the safety-related facilities.

2.4.4.1 References

201. U.S. Geological Survey, *Florida Topographic 2 Sided Map*, Florida South Section, Scale 1:500,000, 1989.
202. American National Standards Institute/American Nuclear Society, *American National Standard for Determining Design Basis Flooding at Power Reactor Sites*, ANSI/ANS-2.8-1992, 1992 (withdrawn 2002).
203. Palm Beach County, Florida, *Unified Local Mitigation Strategy*, 2009.