

Saving the Guajataca Dam Spillway: Interim Risk Reduction Measures

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On September 20, 2017, Hurricane Maria, one of the strongest tropical cyclones in history in the Caribbean basin, struck the island of Puerto Rico dead on, causing anywhere between \$43B and \$139B in damage. Every corner of the financially troubled island state was affected, especially their power grid and water supply systems. The island has over 40 dams, but Guajataca Dam, in the northwest region of the island, took the blunt of the damage induced by the hurricane on these structures. On 22 September, news media were reporting significant damage to the emergency spillway, and soon thereafter, the Corps of Engineers was called into action to support the dam owner, the Autoridad de Energia Electrica (AEE), also known by its English Acronym as PREPA, to address the emergency. The flow over the spillway had resulted in the loss of nearly half of its concrete section due to scour and undermining, leaving a scour hole 60 ft deep, over 200 ft wide and over 400 ft in length. The Corps of Engineers was on site within 48 hours and with support from PREPA and its onsite contractor, started efforts to stabilize the precarious situation. The Corps soon had a small team of geotechnical, structural and hydraulic engineers from Jacksonville District and the Risk Management Center in Denver, guiding the stabilization efforts with the air support of the US Navy, Marines and Army helicopters. The airborne operations went on for over three weeks and once the immediate emergency was contained, Interim Risk Reduction Measures were planned, designed and constructed in about 1.5 years to bring the spillway to a serviceable condition. This technical paper provides a brief background on the event and discusses and presents (written form and pictorially) the IRRMs that were carried out triumphantly during strenuous circumstances, lacking electricity, telecommunication and internet capabilities.