

Installation of Offshore Intake Lines Via Microtunneling in a Heavy Surf

The National Energy Laboratory of Hawaii (NELHA) Ocean Thermal Energy Conversion (OTEC) project required two concrete, 54" ID intake lines installed in 80 feet of water, 575 feet offshore. These lines are to be connected to pipes that will bring cold water from a depth of 3000 feet and warmer water from a depth of 25 feet to an OTEC production site. The purpose of the project is to produce electricity from the differential temperature of approximately 21 C.

This project is widely viewed as the most difficult microtunneling project ever undertaken, requiring many innovations in construction techniques and equipment design. The microtunneling was completed from a 54 foot deep driven shaft located 10 feet from the shore line. The offshore drives were unique in that they were the first ever to use a slurry MTBM with a rock head in volcanic debris (including sands, clinker, and 20,000 psi solid basalt) in full 80 foot water head conditions. In addition to the two ocean drives, there were two 420 foot inland drives from the same shaft up to the location of the new OTEC production site and through similar geologic formations.

This was a project in which existing technology and equipment were extended to the unknown in an application never before attempted. The project provides NELHA engineers the opportunity to demonstrate the potential of a full scale OTEC facility, utilizing the renewable stored thermal energy of the ocean to produce electricity.

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