**Project Name:** AFAR Azores Cable Landing

**Organizations/People Involved:**

Naval Undersea Sound Laboratory (Naval Undersea Warfare Center Newport)

NAVFAC: PC-2 Walt Eager

UCT-1: Lt Scott Stevenson; UCT-1 had not yet been commissioned but was operating as a unit of the 21st Construction Regiment in Davisville, RI.

**Date:** Summer 1970

**Project Summary:** After completing the construction experimental deployment of the AFAR array in AUTEC in February, 1970, the planned deployment of the array moved to Santa Maria Island, Azores in the summer of 1970 for its final installation. This deployment involved the use of two cable laying ships, the Italian Cable Laying Ship SALERNUM and the British Cable Laying Ship BULLFINCH. The array was installed in deep water off the Santa Maria Island and four undersea cables were laid from the array back to shore on the island. Each of these cables were to be installed with Project Caesar split pipe for 1500 feet offshore and anchored to the seafloor using rock bolts.

The principal difficulty with this cable installation project was that the seafloor was basalt rock with deep ravines running transverse to the cable path and the shore landing site was a steep slope of 500 feet high in elevation which precluded the use of vehicles on the beach to aid in the cable pulling operations. Thus, the cable landing operation required the installation of a 36-inch sheave anchored on the beach and the cable pulled up the cliff by two dozers which provided the pulling force to land the cable. During the cable landing operations, two LCM-6 crafts were used to keep the cable from drifting off alignment due to currents.

Some of the seafloor cable path and near shore landing sites had to be blasted out with dynamite and hose charges to allow the cable to be safely installed.

After the pathway was cleared of obstructions, the first two cables were hauled ashore by the Seabees from the cable ship using the typical float balloon methods of landing shore cables and the dozers to pull the cable ashore.

Typical split pipe cable securing operations would take one month per cable for the 1500 feet of split pipe installation. Weather conditions at Santa Maria can include 40-foot surf conditions so finding a faster solution to install the pipe was needed. Two new split pipe installation methods were devised which cut the time in half for the first two cables and by a greater amount for the second two cables.

In lieu of installing the split section by section underwater, the split pipe was installed on the first two cables on the beach in 30-foot sections and then a motorized barge pulled that section of split pipe along the cable where it was connected to the last section. Because the first two cables were of smaller diameter than the split pipe, this technique could be used. After each 1500 feet of split pipe was installed and towed into place, divers then drilled holes in the basalt seafloor and anchored the split pipe against heavy surf conditions.

The second two cables were of a larger diameter precluding the use of installing the split pipe on shore and dragging it along the cable. Therefore, a second split pipe installation method was devised for the large diameter cables. For these cables, a pontoon barge was moored offshore beyond the surf and aligned to the cable path. The cable was then pulled ashore across the pontoon and the split pipe installed on the cable. It was installed in a 75 feet section and then moved off the barge using cable floats to then lower it to the seafloor. After the cable ship laid the remaining cable to sea, the barge was used to underrun the cable and install split pipe to the full length of the cable. This task was accomplished in two days per cable thus saving weeks of split pipe operations. All the cables were rock bolted to the seafloor.

**Project Report Link:** DTIC ADA955064  Navy Ocean Construction, CDR Walt Eager, Technical Paper.