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RELOCATION OF FRENCH FRIGATE SHOALS \$1,400,000

PHASE I \$750,000
PHASE II \$650,000

The LORAN-A station, French Frigate Shoals, which has been located on Tern Island, French Frigate Shoals, since 1951, serves as a double master LORAN station, providing LORAN-A coverage which is required by the Department of Defense and Air and Marine Commerce of the United States.

Tern Island was developed during World War II by the U. S. Navy. The project consisted essentially of construction of an air-strip with a dredged channel leading to it. The limits of the air-strip were defined by inter-locking flat steel sheet piling. In 1951 when the LORAN-A station was moved from East Island to Tern Island extreme deterioration of the sheet piling was obvious. However, no significant failure had occurred at that time. Failures which have required temporary repairs have occurred in 1953, 1956 and 1958. The low-lying island is vulnerable to storm waves, especially during period of unusually high tides. At these times, debris is carried over the whole runway and the piling and full protecting the runway are eroded.

At the present time a major failure of the riprap could occur with little or no warning. This would jeopardize the runway and, ultimately the station. The runway has many shallow depressions which are becoming deeper and softer and creating a hazard for aircraft using the strip. Failure to remedy these conditions will lead to ultimate loss of the existing sheet piling bulkhead and closing of the air-strip through which the station receives its logistic support.

If the LORAN station is to remain at French Frigate Shoals, we are faced with major replacement of piling or riprap around the island or a combination of both plus grading, curbing and resurfacing of the runway. The cost to perform this is estimated to be well in excess of \$3,000,000. It should be recognized that even these repairs cannot guarantee a safe and habitable island against severe storms, typhoons and tidal waves.

Implementation of LORAN-C in the Central Pacific makes possible an alternate solution. By using the LORAN-C stations at Hawaii, Johnston and Kure to maintain synchronization for the LORAN-A system it will be possible to eliminate French Frigate Shoals as a LORAN-A site. LORAN-A rates from Hawaii to Johnston to Kure, in lieu of Johnston to French Frigate Shoals to Kauai will provide LORAN coverage over a greater area. Preliminary engineering studies indicate that use of the LORAN-C system to synchronize a LORAN-A system over long baselines is feasible.

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No additional buildings or personnel will be required at the Loran stations Hawaii or Johnston Island. Some additional barracks space, together with a signal building of approximately 800 square feet and a LORAN-A antenna system, will be required at Kure.

Collocation of the LORAN-A station with the LORAN-C station at Kure will require four additional billets. This will result in an overall saving of 11 enlisted billets and reduction of 1 CO to 1 WO from the combined requirement at Kure and French Frigate Shoals. The reduction of personnel resulting from the collocation of the A and C at Kure and elimination of maintenance at French Frigate Shoals will result in an annual savings of approximately \$100,000 in operating expenses.

This project will be accomplished in two phases. Phase one for the development and testing of the electronic equipment modification necessary to enable the LORAN-C system to provide a synchronized trigger to the LORAN-A. Phase II for: (a) the construction of a LORAN-A station at Kure Island, collocated with the LORAN-C station; (b) establishment of permanent LORAN-A rates between Johnston and Kure and Johnston and Upolu Point and (c) relocation of the LORAN-C monitor station, French Frigate Shoals to an alternate site; and (d) the disestablishment of the LORAN station, French Frigate Shoals. The equipment modification development and testing under Phase I will probably also be utilized in implementing new long range concepts for a combined LORAN A-C system.

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