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TO: Resident Manager, Holmes & Narver, Inc., EPG

FROM: Resident Engineer, Holmes & Narver, Inc., EPG

Report of a reconnaissance trip to Nauru Island, Nauru Atoll, by Mr. Dunlap, Resident Engineer, Holmes & Narver, and Mr. Butts, Acting Branch Chief, USAEC, EBO.

Lt. Col. Eugene W. Cox, USAF, Commander, 4951st Support Squadron (Test), commanded the C-47 aircraft on this flight and supplied valuable information on matters of air safety and re-supply.

The purpose of this trip was to review weather station sites which were tentatively located on a previous mission on 23 July 1956.

A brief log of this trip is as follows:

25 February 1957:

Take-off by C-47 aircraft from Eniwetok Island at 0825 hours. Arrival at Nauru Island at 1350 hours.

26 February 1957:

Meeting between the Official Secretary, Mr. Hutchnance, Mr. Butts, Mr. Dunlap and Lt. Col. Cox at 0900 hours for a general discussion of site adaptability to construction conditions and the general problems involved in siting and land acquisition.

Meeting at 1500 hours between the native Head Chief and a member of the native council and Messrs. Hutchnance, Butts and Dunlap for the purpose of introducing Mr. Dunlap and Mr. Butts to the Head Chief and to determine, if possible, the general reaction of the Head Chief to the possibility of construction involving Island territory which is owned by the natives themselves.

27 February 1957:

Take-off from Nauru Island at 0930 hours and arrival at Eniwetok Island at 1454 hours.

Report of discussions, findings and recommendations:

The Administrator, Mr. R. S. Leyden, was unable to attend, and therefore, all discussions regarding siting were with Mr. Hutchnance, the Official Secretary.

At the meeting at 0900 hours on 26 February 1957, it was specifically pointed out by all present that this visit was only for the purpose of orientation of the members present in the event that weather station construction might be started at some future time on this island, and it was also agreed that no

commitments of any sort could be made by any of the parties present.

The question of use of native labor was raised by the Secretary and he was advised that possibly 10 to 15 natives could be utilized for unskilled labor, but that the large majority of construction would necessarily be accomplished by skilled labor, such as, carpenters, mechanics, etc. This was established as being satisfactory.

It was pointed out that a weather station at this site would be air supported and the Secretary asked if these support flights could carry mail to and from the island of Nauru in order to expedite their mail service, which is necessarily slow. Lt. Col. Cox stated that so far as he knew, there would be no objection to this, and Mr. Butts concurred that AEC would place no restrictions on this service, within the capabilities of aircraft and personnel and the mail handling facilities at Eniwetok.

The Secretary was advised that supply of construction materials and equipment would be made by surface craft and that it would be necessary to utilize facilities of the British Phosphate Commission in docking and possibly off-loading of equipment and material. As Nauru has no lagoon and is surrounded by wide reefs, it is not possible for deep draft vessels to approach the British Phosphate Commission Docks. All cargo must therefore be lightered in from an anchored vessel to the British Phosphate Commission's dock. The British Phosphate Commission has available dock cranes, self-powered barges and other lightering equipment which can be utilized in the off-loading and lightering of cargo from the ship to the dock. The above method would undoubtedly be used if an LST is used for transportation of cargo. In the event that an LSD is available, it would be possible to utilize loaded LCM craft transported by an LSD. The reef at the dock at Nauru is at approximately elevation one feet, and the maximum high tide is approximately six feet. Under conditions of mean and high tide, it would be possible for LCM's to reach the dock and be off-loaded by dock cranes, in which case it would not be necessary to utilize the British Phosphate Commission lightering barges. Due to the fact that LST's are usually more readily available than LSD craft, we would recommend the use of LST's or other available surface carriers, together with the lightering equipment furnished by the British Phosphate Commission. In order to provide additional information regarding marine facilities, we are attaching a copy of the report from J. Paolozzi to the Resident Manager, Holmes & Narver, dated 27 July 1956. This report is complete and accurate with the exception that the earth moving equipment mentioned in the last paragraph of this report is not available at this time due to the expanded activities of the British Phosphate Commission's mining project.

Captain Anderson, the Harbor Manager and Acting General Manager for the British Phosphate Commission, was contacted regarding availability of construction equipment and materials, and it was determined that ready-mix concrete is available and could be delivered to construction sites by transit-mixers. It was also determined that trucking equipment is available for transporting of construction materials and equipment from the British Phosphate Commission

docks to the proposed weather station site. The availability of other construction equipment, such as, cranes, forklifts, etc., was discussed with Captain Anderson and it was found that forklifts were not available and that general construction equipment, other than facilities for transit-mix concrete and transporting cargo, were not readily available, due to the fact that all such equipment is normally required by British Phosphate Commission mining activities.

The local electrical power on Nauru is 250 volt, 50 cycle, and the present demand is such that it has recently been necessary to extend the existing system in order to serve the present facilities. Due to the fact that weather station equipment requires 60 cycle current and relatively close voltage control for instruments, it is strongly recommended that power for the weather station be independently supplied by 60 cycle AEC or government furnished generators, in line with our normal practice.

The water supply of Nauru Island is by rain catchment and from fresh water brought in as ballast in British Phosphate Commission ships. The water supply is adequate for the needs of the present population; however, the supply is subject to wide fluctuation depending upon arrival of ships and rainfall. In order that a sufficient fresh water supply is available at all times for weather station personnel without encroachment upon the supply for the inhabitants of Nauru Island, it is also strongly recommended that water supply for the weather station be by distillation units as normally employed at our off-island weather station sites.

It is also recommended that weather station communication facilities be independent of the Nauru communication facilities in order that uninterrupted communications will be available during critical periods. Since it is assumed that weather station power will be independent of the Nauru power supply and the communication equipment will be government supplied, an independent communication system presents no problems other than the erection of an antenna system, which is a relatively minor item.

The attached drawing, No. FS-6161, Revision No. 1, titled "Nauru Island", July 1956 survey, reflects the weather station siting as proposed during the previous survey trip to Nauru on 23 July 1956. During the current trip and immediately following the meeting with the Secretary on 26 February 1957, the weather station sites previously selected were reviewed and it was recommended that new sites be chosen for the following reasons:

Site No. 1 previously selected is on the edge of a bluff approximately 150 feet high, and is approximately two miles by road from the airstrip. This site is inadequate in size and does not lend itself to economical construction due to transportation difficulties, and also the fact that sewage disposal would involve either a long pipeline or possible contamination of nearby areas if a leaching field were installed. Other than an area approximately 35' x 75', this site is in location from which phosphate has been removed and there are

many rock pinnacles which would have to be removed by blasting and by bulldozer. The fresh water supply also presents a problem in that it would be necessary to install a booster pump near the shore to provide sufficient pressure to raise water from sea level to the weather station site, a vertical distance of approximately 150 feet. This would involve also a pipeline approximately one-half mile in length. Re-supply of the weather station at Site No. 1 would also involve a transportation problem, both for personnel, material and equipment due to the distance from the site to the airstrip.

Site No. 2 as previously selected presents essentially the same problems from a construction standpoint as Site No. 1, with the exception that this site is approximately one-quarter mil farther by road from the airstrip than is Site No. 1 and is slightly farther from the ocean. This site is, however, slightly larger in area and does not have the rock pinnacles which are present at Site No. 1.

Site No. 3 as previously selected is unacceptable, principally from an air navigation and air safety standpoint, in that this site is approximately one-quarter mile from, and directly in line with, the existing airstrip. Lt. Col. Cox stated that this site would be extremely hazardous from the standpoint of air safety and that this site would undoubtedly be strongly opposed by the Australian aviation authorities. The Secretary also mentioned that plans were being made to lengthen this runway and that the lengthened strip would also interfere with the siting of a weather station in this location. An attempt is also being made to license this field for larger aircraft, and the siting of this weather station in line with this airstrip would seriously hamper these efforts.

Although it was not the intention of the members of this party to make an evaluation, from a weather operation standpoint, of the sites as selected by the survey team of 23 July 1956, it is felt that the above comments are extremely pertinent in the interest of air safety and economy of construction. For these reasons it was felt that alternate sites should be selected prior to the departure of the members of this party from Nauru Island.

Drawing FS-6161, Revision No. 2, titled "Nauru Island", February 1957 survey, reflects a recommended site and two alternate sites for a weather station at Nauru, and the location and suitability of these sites is concurred in by Mr. Butts, Mr. Dunlap, Lt. Col. Cox and the Secretary, Mr. Hutchnance. These sites were also discussed with the administration surveyor and have his concurrence regarding the suitability of these sites and the possibility of their being made available without excessive delay.

Site No. 1, which is the recommended site, is south of and in the approximate center of the airfield and is located 300 feet west of the existing Administration Building and approximately 40 feet east of the existing school. The site is 175 feet wide by 330 feet long and with the southern edge at the top of bankline

above the ocean reef. The reef at this point is approximately 600 feet wide and at an elevation of approximately two feet. Due to the proximity to the airfield, it is suggested that the antennas at Site No. 1 be erected on the reef. The ground at this site has a very slight slope toward the ocean and is covered with grass and low brush which could be easily removed by a grader. This site would in no way interfere with airfield operation or expansion and would be convenient for re-supply by air.

Site #2 is located at the extreme north end of the island and is also on a flat area near the top of bankline of the island. This site is approximately 3-1/2 miles by road from the airstrip although there are no grades involved and the road is in good repair. This site is of approximately the same dimensions as Site No. 1 and the reef at this point is approximately 800 feet wide and at an elevation of approximately one foot.

Site No. 3 is on the eastern side of the island and approximately two miles from the airstrip by a well maintained road. The remainder of the characteristics of this site are the same as at Site No. 2.

Weather station construction at either sites No. 1, 2 or 3 would be uncomplicated and relatively inexpensive from a construction standpoint as there is ready access to the open ocean for sewage disposal and for salt water intakes for cooling water and for distillation purposes. These areas are accessible without hauling equipment and material up steep grades as a maximum elevation of any of these sites does not exceed 10 to 12 feet.

At sites No. 2 and No. 3 it would also be possible to locate the antennas on the reef, itself, thereby permitting proper orientation without the necessity of removing trees.

Although these sites appear suitable from construction and support standpoints, it is recommended that weather station and communication personnel visit these sites prior to final acquisition of land for any one of these sites.

At the meeting at 1500 hours between the native Head Chief, a member of the council, the Administration Secretary, Mr. Butts and Mr. Dunlap, the Head Chief inquired regarding delivery of mail by any air support that would be involved during future construction. The Secretary advised him that this matter had already been discussed favorably with the parties present and with Lt. Col. Cox and that it was very possible that support flights could be used for mail delivery. The Head Chief also inquired as to the possibility of transportation of a small number of island personnel from Nauru to other inhabited islands which would lay on the route of the support vessels to and from Nauru. He was advised that this would be a matter which would be taken up between the AEC and the Administrater of the United States Trust Territories in the Marshalls, but that his request would be made known to the Trust Territories officials at the earliest opportunity. Mr. Hutchnance also advised that he would take the matter up through his Administration. The question was also raised regarding employment of native labor and it was stated that native labor would be utilized

wherever possible; however, it was improbable that native labor in excess of 10 to 15 would be required. Mr. Hutchnance pointed out to the Head Chief that this visit was unofficial and primarily for the purpose of introducing Mr. Butts and Mr. Dunlap to the Head Chief and that the Administration of Nauru would negotiate directly with the Head Chief should any questions arise involving acquisition of land or use of native labor.

The attitude of both the Head Chief and the council member was extremely friendly and they both expressed a desire to cooperate in the event their assistance was needed in any future construction program.

The meeting adjourned at 1600 hours.

It should be pointed out at this time that all officials contacted, either with the Administration, the British Phosphate Commission or the native population were extremely courteous and cooperative and it is the concensus of opinion of the members of this party that full cooperation will be extended during survey and construction periods of this proposed weather station. It should be pointed out also that messing and housing facilities of Nauru are not available for a large influx of visiters for any length of time and that, prior to construction of the weather station camp, efforts should be made toward curtailing the number of visiting personnel as far as is practical in order to accomplish the purpose of the visit.

CFD:jm
Encs.: Drawing FS-6161, July 1956 Survey
Drawing FS-6161, February 1957 Survey
Memorandum Report from J. Paolozzi, dtd. 27 July 1956

cc: Acting Branch Chief, USAEC, EBO (6 copies w/encs.
Acting Chief Project Engineer, H/O (2 copies w/encs.
J/S Chrono
J/S Central
J/S Engineering
J/S Engineering Reading File
J/S Job Folder #3266

There are several fixed, single-whip cranes around the edges of the basin, each with a 3 to 5 ton capacity, and one crawler-type crane of about a 10 ton capacity.

The surface at the boat harbor area is paved, including a paved access to the main road.

Photographs of Nauru Boat Harbor were taken by Mr. Allen Jones, H&N Engineering Division.

Mr. Anderson, Harbor Master at Nauru Island for over twenty years, was very helpful in gathering this information. He meets all vessels and assigns berths (free). Tugs and barges are available. The barges are one-hold construction, 35 feet long, 16 feet wide, and have about a 16 ton, good weather capacity. Off-loading weather conditions are generally good. The storm (bad weather) period extends from November to March. In recent years a period of 21 non-workable days accrued. During those times, vessels put to sea.

The local method for off-loading vessels with general cargo is to hoist cargo over the sides into the barges. The barges are then towed into the boat harbor and spotted under the fixed small cranes or under the fixed overhead travel crane. Stevedoring, with modern off-loading equipment, is available.

The final agreed analysis of Lt. Cmdr. N. Evans of the USS CATAMOUNT and myself is stated below:

1. Beaching of LSTs is not recommended due to unfavorable beaching conditions and due to the thickly populated section in the beach area (homes, industry, walls, fences, telephone poles, gardens, etc.)

2. LSTs can be used by off-loading into barges over the side - thence to the boat harbor. A crane of adequate capacity should be put on deck to handle the off-loading.

3. LSDs can be used if equipment beyond the capacity of the crane aboard the LST is needed ashore. Two methods may be used:

   a. Loaded LCMs from the wall of the LSD can be floated out of the well and enter the boat harbor at a - 1 foot tide or more (according to the depth of the swells) and positioned under the cranes. Long mooring lines will be required. The sea wall is about 20 feet high at low water (50 foot mooring lines for LCMs would be adequate).

   b. Off-load cargo over the side into barges. This would be the same procedure outlined for LSTs in subparagraph 2.

NOTE: The two piers referred to in Sailing Directions, "The Pacific Islands", Vol. III, are the two jetties mentioned in this report.

The landing jetty and crane pier referred to in the above publication were not inspected and general information indicated they were not in use.

There are many favorable conditions available at Nauru which will be discussed

in other reports. The above report covers the Marine phase of the mission. The type of vessels used should be determined by the size and weight of cargo and equipment that will be landed. The British Phosphate Commissioners in control of the mining industries have adequate equipment for dirt moving (such as cranes, etc. on the spot).

JP:mc

cc: N.W. Sears
C.F. Dunlap

J. Paolozzi
Superintendent
Marine Operations