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February 4, 1955

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AEC 730/14

COPY NO. 16

ATOMIC ENERGY COMMISSION

DEBRIS FROM CASTLE

Note by the Acting Secretary

The General Manager has requested that the attached exchange of letters with the Chief of Naval Operations and letter to the Commandant, U.S. Coast Guard, be circulated for the information of the Commission.

HAROLD D. ANAMOSA

Acting Secretary

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BY AUTHORITY OF 5200.1-R
BY R. Turner DATE 3/27/73

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BY AUTHORITY OF EOE/OG
Carl W. Smith 1/24/84
DATE

~~This material contains information affecting the national defense of the United States within the meaning of the espionage laws, Title 18, U.S.C. Sec. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.~~

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This document consists of 9 pages

Copy No. 16 of 19 Series A

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ENCLOSURE I

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D. C.

January 31, 1955

Admiral Robert B. Carney
Chief of Naval Operations
OP-OO, The Pentagon
Washington 25, D. C.

Dear Admiral Carney:

Data have come to our attention which indicate that radioactive debris trapped originally in the North Equatorial current during Operation CASTLE may be moving via the Kuroshio Current toward the islands of Japan and Formosa, a possibility which appears to have political as well as scientific significance. In order that we may fully evaluate the information now at hand, detailed monitoring of the Western Pacific must be undertaken as soon as possible. The purpose of this letter, therefore, is two-fold: (1) to inform your office of the nature of the phenomenon which seems to be occurring; (2) to request that a vessel suitable for a survey of 3 - 4 weeks' duration be made available and ready to depart from Guam on or about March 1, 1955 with a team of about six scientists to be assembled by the Atomic Energy Commission.

The problem can be summarized as follows:

1. One of the important findings during CASTLE was that a large fraction of the radioactive debris from a thermonuclear device detonated close to the surface is deposited within 100 miles of the site of detonation. On the basis of studies we performed after detonations from both land and barges, it appears probable that more than half of the radioactive debris produced by the CASTLE series of detonations may have fallen into the Pacific in the immediate vicinity of the Marshall Islands.

2. The AEC delegates to a Japanese-American Radiobiological Conference held in Tokyo last November returned to this country with data obtained by the Japanese scientists during the voyage of the SHUNKOTSU MARU, a research survey vessel which collected ocean samples in the mid-Pacific during the month of May and June. The course of the SHUNKOTSU MARU is attached in Exhibit A which shows

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that the vessel traversed the north equatorial current at three distances west of Bikini. In the course of these traverses, the Japanese scientists obtained water samples at various depths and from their data have constructed the profiles showing contamination with depth at each of their traverses. These profiles are attached as Exhibit B.

3. The Japanese data are consistent with our data obtained during CASTLE which indicate that diffusion occurs rapidly between the surface and the thermocline but that exchange with water below the thermocline takes place very slowly. Moreover, tritium measurements of ocean water by Dr. Willard F. Libby, while at the University of Chicago, suggest that material distributed between the surface and thermocline are diffused with a half-life of about 18 years. This exceedingly slow rate is explained by the surprisingly small coefficient of exchange across the thermocline.

4. The Japanese data also suggest that lateral diffusion from the equatorial current is likewise proceeding at a slower rate than would have been expected on the basis of previously available knowledge.

5. The Japanese data have been reviewed by oceanographers from the Woods Hole and Scripps Institute of Oceanography and the AEC technical staff. In their opinion a large part of the radioactivity observed in the North Equatorial current will eventually flow into the Kuroshio current in the manner illustrated in Exhibit C which projects the course of this activity for the next few months. The diminution in activity between the end of June when the Japanese made their last survey and 1 March 1955 would be in the order of 90% due to radiological decay and oceanographic factors. This presents us with the possibility that large masses of the equatorial and Kuroshio current may continue to be radioactive in amounts which do not necessarily constitute a health hazard but which are certainly high enough to attract the attention of Japanese scientists.

6. The radioactivity of the Kuroshio current to the west and north of Guam should be assessed. In order to facilitate monitoring of these waters an appropriate vessel is needed to sail from Guam on or shortly after 1 March 1955 on a reconnaissance of Far Eastern waters for a duration of two to four weeks. We would assign six scientists to this vessel and would make available certain laboratory equipment by which samples could be obtained and their significance assessed on a current basis. The course of the vessel should approximate that shown in Exhibit C but operational flexibility should be provided and the actual course determined by the day to day research findings of the scientific staff assigned to the mission.

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7. It is our understanding that a Coast Guard vessel suitable for the mission is available at Pearl Harbor. We have been informed that the Chief Office of Naval Research, is preparing a letter to the Commandant, Coast Guard, requesting use of this vessel. Arrangements have been made with Op 36 to obtain surface water samples during the first two in February in the Far Eastern waters as outlined Appendix D. These samples will be sent to the AEC Health and Safety Laboratory, New York, New York, analysis and will make it possible for us to obtain valuable preliminary information as to distribution radioactivity in these waters.

8. The Department of State has been informed of above facts and concurs in the need to undertake the surveys as soon as is technically feasible.

9. Dr. John C. Bugher, Director of the Division Biology and Medicine, has assigned to the AEC Health and Safety Laboratory the execution of the scientific mission on behalf of the Commission. They will assemble the equipment and personnel required for the survey.

Very truly yours,

/s/ R. W. Cook, Deputy

K. D. Nichols
General Manager

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ENCLOSURE II

DEPARTMENT OF THE NAVY
Office of the Chief of Naval Operations
Washington 25, D.C.

Op-36C/jm
Ser 0062P36

1 February 1955

FROM: Chief of Naval Operations

TO : Chairman, Atomic Energy Commission

SUBJ: NAVAL VESSEL, REQUEST FOR SERVICES OF FOR SPECIAL OCEANO-
~~GRAPHIC SURVEY~~ GRAPHIC SURVEY

REF : (a) AEC Secret Ltr BME:HCB of 31 Jan 1955 to CNO

1. By reference (a) the Atomic Energy Commission requests the services of a suitable ship for a special oceanographic survey of 3 - 4 weeks duration in the Pacific Ocean starting about 1 March 1955. Reference (a) also states, "It is our understanding that a Coast Guard vessel suitable for the mission is available at Pearl Harbor."

2. In view of the Far East situation and the heavy operational requirements now placed upon all naval vessels in the Pacific Fleet capable of conducting such a survey the Chief of Naval Operations regrets that it is impracticable to comply with your request. It is suggested that you make your desires known directly to the Commandant, U.S. Coast Guard.

3. The Navy will be glad to cooperate at Pearl Harbor in making available the technical facilities necessary to install the survey gear on a Coast Guard vessel. It is understood that expenses involved in such work will be borne by the Atomic Energy Commission.

4. Concerning the statement in paragraph 7 of reference (a) that arrangements have been made with Op-36 to obtain surface water samples in Far Eastern waters, this is being done as practicable.

R.P. Briscoe
Deputy Chief of Naval Operations
(Fleet Operations and Readiness)

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ENCLOSURE III

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C.

February 3, 1955

Admiral Alfred C. Richmond
Commandant
U.S. Coast Guard
Washington, D.C.

Dear Admiral Richmond:

The purpose of this letter is to request that a suitable Coast Guard vessel be made available to the U.S. Atomic Energy Commission for the purpose of accomplishing the special mission hereinafter described. The Commission is in the possession of scientific data which strongly suggest that radioactive debris from Operation CASTLE, originally trapped in the North Equatorial Current, are now moving via the Kuroshio Current toward the islands of Japan and Formosa. It is vitally important to the Commission's scientific program and to the future use of the Pacific Proving Grounds to assess the possibility described above and to determine with greater precision the fate of radioactive contamination from the detonation of nuclear and thermonuclear devices in the Pacific. We believe also that should levels of radiation significantly above natural background be detected in Formosan and Japanese waters, important political consequences might ensue regardless of the fact that the activity is not considered to be harmful to health.

Discussions with the Office of Naval Research and the Office of the Chief of Naval Operations (Op 36), and who we understood were in contact with Captain C.G. Bowman, Commanding Officer, Floating Division, and Lieut. D.A. Webb, Testing and Development Division, U.S. Coast Guard, led us to believe that (1) the Navy could not provide a suitable vessel due to prior commitments, (2) a suitable Coast Guard vessel, an AVP, the USS Matagorda, was available to the AEC at Pearl Harbor, and (3) the procedure to obtain the vessel was a formal request to the Chief of Naval Operations. Hence, a letter to the Chief of Naval Operations, a copy of which is enclosed, (with attachments), was prepared and dispatched. We now understand that the Chief of Naval Operations prefers that the AEC make direct application to the Commandant of the Coast Guard - which is the purpose of this letter.

It is planned that the proposed survey be a joint undertaking by the AEC and the Office of Naval Research. We understand that by letter dated January 28, 1955 the Office of Naval

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Research, on behalf of that office and the Atomic Energy Commission, made a similar request of the Coast Guard for a vessel. The AEC has been provided a copy of the ONR communication and it is noted that it refers to a survey distance of 3,000 to 5,000 miles, and a cruise of about three to four weeks. The cruise should now cover a track of about 12,000 to 14,000 miles and be of a duration of about six to eight weeks.

Ideally, a vessel is desired which would cruise at 16 - 18 knots, accommodate six technicians, offer sufficient deck space to mount a hydrographic winch (8' x 6'), and allow approximately 20 square feet of enclosed working space for technicians and electronic gear. In this respect the USS Matagorda would be most adequate. It is realized, however, that your own demands for such a vessel may be great and that you may find some alternate arrangement more feasible. Should this be the case, we would be prepared to discuss such alternate arrangements.

The proposed survey is of vital importance to the atomic energy program and bears significantly on matters of national defense. We trust, therefore, that you will give favorable consideration to this request. If preliminary calculations are correct, the trapped radioactive debris could reach Formosa and Japan as early as March, 1955. It is important, therefore, that the cruise get under way as soon as possible, preferably on or shortly after March 1, 1955.

Dr. John C. Bugher, Director of the Division of Biology and Medicine, AEC, has been assigned general responsibility with the AEC for carrying out the mission. Technical execution will be under the AEC's Health and Safety Laboratory, New York Operations Office, New York City. Dr. Bugher's office will be happy to provide whatever additional assistance may be required or provide such additional information as you may need.

Sincerely yours,

/s/ R.W. Cook

K.D. Nichols
General Manager

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Enclosure III

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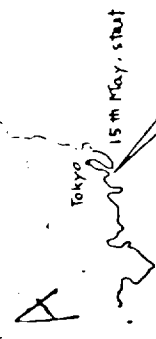
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 For The U. S. Atomic Energy Commission
Dorothy K. Gibner
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PLAN OF COURSE LINE

21 Days from Wake Is. to Wake Is.
 21 Days from Wake Is. to Tokyo



Marcus Is.

N 20°-00'
 E 154°-00'

Wake Is.
 (25 m. May m.)

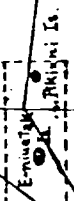
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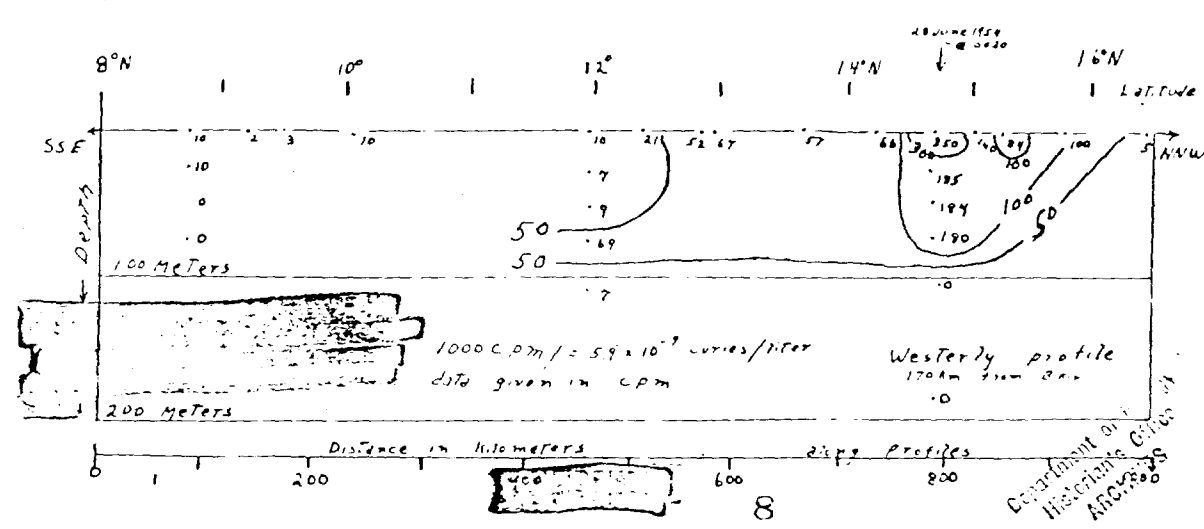
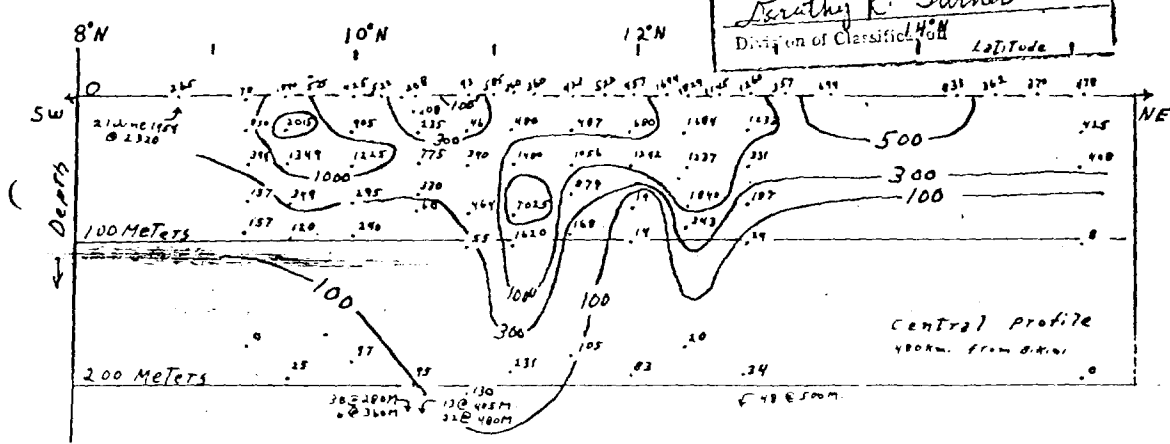
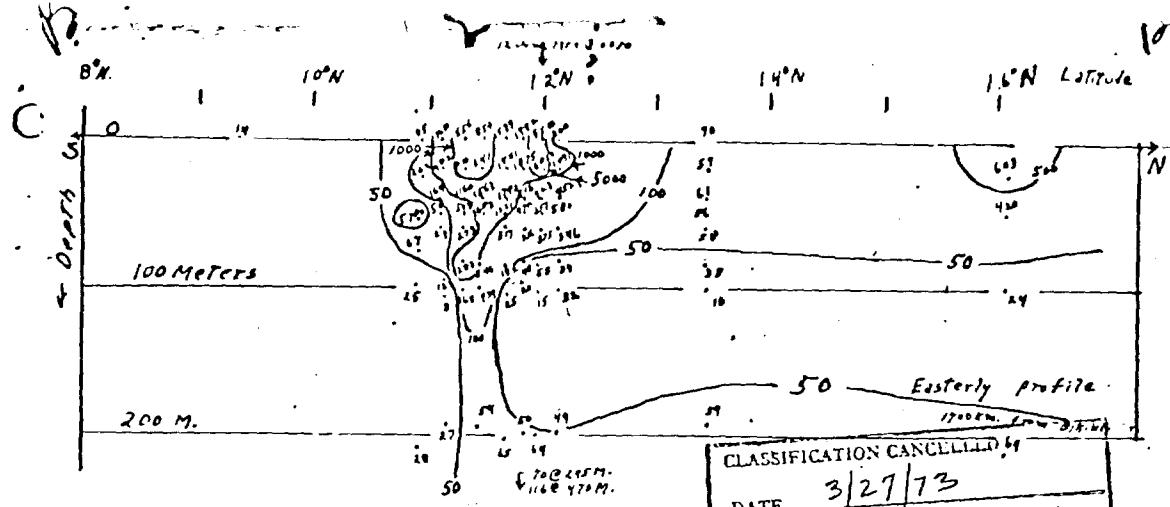
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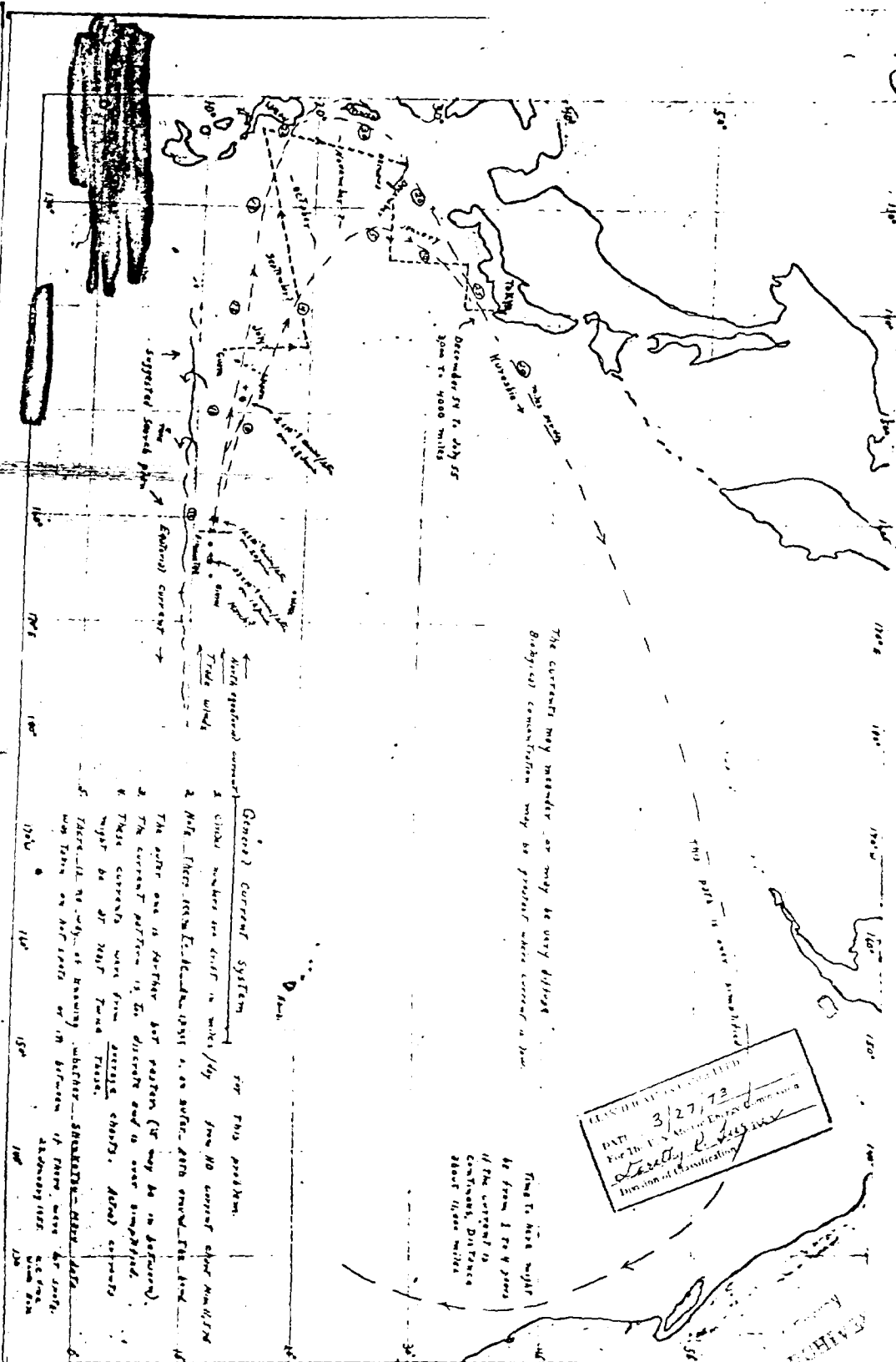
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The currents may meander, or may be very different.
Biological concentration may be greater when current is low.

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DATE 3/27/73
FOR THE U.S. Atomic Energy Commission
BY *Stanley R. [Signature]*
Division of Classification

Time to here might
be from 1 to 4 years
if the current is
constant. Distance
about 11,000 miles

General current system for this problem.
1. Check whether an error is made/why. See no error of other models.
2. Note these items: *El Niño* is an surface phenomenon. The wind
The other one is farther but pattern (it may be in between).
3. The current pattern is too discrete and is over simplified.
4. These currents were from average charts. Actual currents
might be of very low value.
5. There is no way of knowing whether *SHANSHAN* *SHANSHAN*
was there or not, or in between if there were by *SHANSHAN*
Address: [unclear] Sec 500
Date: [unclear]