[redacted]

the need for such removal it was pointed out that this material is scrap metal containing induced radioactivity and that natives collect and find use for all such materials. The scrap is in the form of metal embedded in concrete, chunks of metal lying on top of the ground surface, and scraps of metal mixed with the top layers of sand and soil. It is not expected that removal of the scrap containing induced radioactivity will make any great reduction in radiation levels on the near test islands since there are quantities of radionuclides, primarily ^{60}Co and ^{137}Cs, in the top layers of sand and soil of these islands.

[redacted]

1. The location of channels in the reef through which boats loaded with scrap must pass is such that disposal outside the reef for scrap locations in the northern portion of the atoll will involve a 25 to 30 mile round trip. Currents may be very strong in these channels.

2. Except for a trace quantity, the radionuclide in the contaminated metal scrap is ^{60}Co with a half-life of about five years. This may be compared with the 30 year half-life of ^{137}Cs which is a major component of soil radioactivity of the near test islands. The scrap contaminant will decay through six half-life periods reaching about 1% of its 1967 value while the ^{137}Cs in soil of the near test islands is being reduced to 50% of its 1967 level.

3. Disposal of metal debris, which will sink to the bottom, in water 150 to 200 feet deep inside or outside the lagoon will make the scrap unavailable to the natives. Such material should not be recoverable without use of special equipment at these depths.

4. The lagoon and ocean floors in the area of test locations already contain a total quantity of scrap expected to be in excess of that found on land. In fact, the added quantity from the land areas would probably be a very small fraction of this total.

[redacted]

nearest island or islet. A record of positions should be made and included in final reports. If any markers are used they should be removed at the end of cleanup operations.

4. Considering the possibility of future salvage of ships, metal scrap containing induced radioactivity is not to be placed within the prohibited area located in the east end of the lagoon (refer to H. O. 6032 published by U. S. Naval Oceanographic Office).

5. Except when collected by those authorized to do so, no samples of metals containing induced radioactivity are to be retained or transported from Bikini Atoll.

[redacted]

3. Any special problems that might be discovered such as plutonium contamination other than in soil or observation of levels of environmental radioactivity (particularly items of the Bikini diet) significantly different from or in addition to that known to the Ad Hoc Committee and contained in HASL 190 and Dr. Gustafson's reports could require additional guidance and should be reported.

Finally, it is known that the distribution of scrap found on these near test islands extends into the shallow water shore areas and on into the deeper parts of the lagoon and ocean. It is suggested that location and removal of this underwater metal scrap is generally not feasible and that any problem with such material is best handled by followup surveys as suggested in item 5 of Attachment 6. It is not intended that item 5 will apply to the cleanup phase of recovery

and rehabilitation of Bikini Atoll. Rather, this is in the nature of a safeguard to be conducted as a part of followup studies.

ORIGINAL SIGNED BY
Martin B. Biles

Martin B. Biles, Director
Division of Operational Safety

Enclosure:
A/s

cc: BM
MA
IA
FI
FRC, Dr. Tompkins
Dept. of Int., Mr. Millner
DASA, Col Bowen

// NEGS READING

OS:NEES	OS:NEES	OS:ADHP	OS:DIR
TFMcCraw/nr			
X7261	Dr.Maxwell	Mr. Catlin	Dr. Biles
5/7/69	5/7/69	5/ /69	5/ /69

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can be found using radiation detectors and scraping the soil to uncover the object.

Results from the 1967 survey indicate that a major contributor to the radiation field in these scrap metal areas is ^{60}Co. This radionuclide is not a fission product, but rather is induced radioactivity in items of iron and steel which have been subjected to neutron irradiation. ^{60}Co was found both in the scrap metal and in the soil samples by the 1967 survey.

It is unlikely that removal of the contaminated scrap metal from the islands adjacent to tests will make a significant reduction in the external radiation fields observed there. For the present, the resettlement program is to be limited to the Bikini-Eneu complex, and no use is to be made of the near test islands except possibly short visits to collect food items such as birds, turtles, and their eggs. Removal of contaminated scrap that would otherwise be available can avoid some unnecessary exposure. The effectiveness of this precaution can be further strengthened by periodic surveys of village areas and work areas to ensure that no contaminated scrap is collected on Bikini and Eneu. Therefore, the purpose and objective of the radioactive scrap removal effort are to make this contaminated material unavailable to the population of the Atoll and thereby to prevent radioactive source buildup through scrap collection activities on Bikini and Eneu. The following recommendations are made to achieve the above-stated objective:

1. There should be radiation monitoring capability to support clearing operations on Bikini and Eneu for determining whether test-related objects that are turned up contain elevated levels of radioactivity. This would include a survey of the area on Eneu (when it is cleared) that was used as an aircraft decontamination location.

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expected to be reduced at the same rate or possibly faster than levels in adjacent soil. The bunker with iron aggregate on Aomen should be repaired such that no further flaking of the iron can occur. The steel doors should be removed from all bunkers to prevent accidental entrapment. Rusting climbing rungs, stairways, and any protruding steel on the outside or inside of bunkers should be cut off with disposal along with contaminated debris, with the exception of the large diagonal structural members on the large bunker on Aerokoj which should be left in place. The damaged bunker at the end of the sand island west of Nam should be removed because of the physical hazard it presents and because of its lack of any useful purpose. For the sand island bunker, the radiation level in the twisted steel members is also a consideration.

4. The steel members protruding from concrete footings or forms on the islands listed in 2. above should be removed for disposal. These have no utility for native use and many of the metal members show elevated levels of gamma radiation. Both the steel and concrete parts should be removed.

5. A followup survey should be made within 12 months after return of the population and at appropriate intervals thereafter to ensure that no contaminated scrap has found its way into the village or work area on Bikini or Eneu.