

Enclosure 1
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To CNO

HARDTACK REF
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OPERATION HARDTACK

410371

1. PROPOSED PROJECT TITLE: Radiological Safety Support for All Target Fleet Projects
2. SPONSOR: U.S. Naval Radiological Defense Laboratory (USNRDL)
3. ORGANIZATION: U.S. Navy
4. PROJECT OFFICER: To be designated

Person responsible for preliminary arrangements: A.L. Baietti, GS-14

Address: Commanding Officer and Director
U.S. Naval Radiological Defense Laboratory
San Francisco 24, California
Attention: Code 730
Telephone: Mission 8-6900, Ext. 240

5. OBJECTIVE:

To provide complete radiological safety support and facilities necessary for equipping sample and data recovery parties and all maintenance and housekeeping parties that will be concerned with the target fleet. This radiological safety support includes preoperational and operational consultation, personnel dosimetry, radiac instrumentation, personnel decontamination center, monitoring services, etc.

6. PROCEDURE:

a. Instrumentation

(1) Navy allowance radiacs (AN/PDR-27F and AN/PDR-18) and industrial monitoring radiacs (Cutie Pie and Berkeley Model 2750 or equivalent side window GM instrument) will be used for area and personnel monitoring and surveying.

(2) Continuous recording air sampling units along with spot air samplers will be used to monitor the aerosol activity concentrations.

(3) Film badges (and associated processing equipment) and self-reading dosimeters will be used for personnel dosimetry .

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Paul P. Brown
for M. C. W. S.
2/10/25/84

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b. Technique

The project will provide health physicists and Bureau of Ships and shipyard personnel trained in radiation and contamination control. The project will assign a health physicist and monitor to each ship of the target fleet as required for radiological support. The necessary radiological safety equipment and instrumentation will be provided.

The project will provide a floating rad-safe center on an APA. This rad-safe center will be equipped to provide a personnel decontamination facility capable of processing 300 persons per day, personnel protective equipment stores, decontamination laundry, complete photodosimetry services, radium issue, calibration and repair facility and a rad-safe training classroom.

The radiation dosage recording and reporting will be supplied by this project through the use of mission and operation film badges. The operation film badge will be used to measure the wearer's integrated gamma dose over a three to four week period while the mission film badge will be processed on a 24 hour schedule to measure the gamma dose a person receives in a short time interval, i.e. performing a mission in a Radex area. Beta sensitive film badges will be provided as necessary as well as 0-5 r self-reading gamma dosimeters.

A Radex Survey of the target array will be made following each event. The initial gross aerial monitoring survey will be made utilizing a P2V-5 aircraft, or equivalent, flying over the array at 500 feet at approximately 180 knots using allowance radiac equipment. The complete gross aerial survey should be completed in less than an hour with a P2V-5 aircraft. Subsequent detailed aerial surveys will be made with a helicopter operating from the APA. These aircraft will be provided by the Logistic Air Support. Radex information will be assembled at the Rad-Safe Center on the APA and reentry into the contaminated array will be controlled from the APA. The APA will be moved into the area of the contaminated array when Radex information indicates the radiation levels in the area have decayed to acceptable values. Subsequent reentry for purposes of rearrangement of ships in the array, decontamination of the target ships for turn-around will be made from the APA.

The major rad-safe support of this project will be devoted to the turnaround of the target fleet. Monitors will accompany the decontamination teams. The Rad-Safe Center on the APA will be designed to provide dosimeter, protective clothing issue and personnel decontamination facilities to process 300 personnel per day. The maximum working day for the decontamination teams will be realized by anchoring the floating rad-safe center in the middle of the target fleet. Decontamination teams could be billeted on the APA until termination of the turnaround, or their replacement is required due to their accumulated radiation exposure.

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The rad-safe center communication network will include the command ship, aerial survey planes and such other locations as necessary for project officers to be advised as to the radiological safety situation, and can thereby instigate the start of recovery and damage control parties. A Radex plot board will be provided and maintained in each of the briefing rooms to advise all personnel planning an entry into the contamination area as to the latest radiological situation.

The pre:perational and operational rad-safe support will be provided to all projects concerned with the Target Fleet studies. This project will review the various target fleet projects to assist them in adequate rad-safe planning and provide the rad-safe support in the field necessary for the safe completion of their missions.

A monitors training program for all of this project's personnel will be conducted at the Naval Schools Command, Treasure Island. This training will consist of the standard two week atomic defense course given by the Naval Schools Command, augmented by an additional two weeks of special training to be given by the experienced radiation and contamination control personnel or health physicists assigned to the project. In addition to the formal four (4) weeks monitors training program, assistance in rad-safe training will be available to other Target Fleet Projects and to TG 7.3 personnel either at the ZI or EPG. A classroom will be setup on the floating Rad-Safe Center for training personnel in the forward area.

7. PROJECT HISTORY AND STATUS:

In Operation CASTLE the radiological support for NRDL's Project 6.4 functioned as Project 6.4g. Project 6.4g provided the radiological safety coverage for all Project 6.4 operations and evaluated existing radiological safety procedures, techniques and instrumentation for their suitability under tactical decontamination conditions and to obtain information to aid in the development of new and improved radiological safety techniques and instruments. In past field operations, radiological safety was considered primarily a service organization. While the provision of adequate support to the test program is indeed a basic and important mission of any rad-safe organization, Project 6.4g attempted to evaluate and improve the service while providing the necessary rad-safe support to Project 6.4.

Since the rad-safe coverage for the entire 7.1 program was provided by TU-7 personnel, it was possible for Project 6.4g personnel to spend more time on Project 6.4's particular problems rather than becoming involved in the broader scope of the rad-safe problems generated by TG 7.1. However, the scope of Project 6.4's program was broad enough to provide

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sufficient opportunity for diversified application of various rad-safe principles. Rad-safe support was given to the various decontamination operations minimizing external exposure and internal contamination. Protective clothing was provided and control points established to minimize the spread of contamination. A personnel decontamination center was provided to ensure adequate decontamination of personnel. Special film badge studies were made to evaluate film badge holders and interpretation procedures compatible with field operation usage. In addition, beta exposure data was collected in an attempt to determine the significance of such exposure. Also, an attempt was made to collect dosage information associated with specific decontamination and recovery operations along with special instrumentation for dose-rate and contamination measurements.

Project 6.4 personnel consisted of 6 health physicist from NRDL supplemented by 10 naval enlisted personnel from the YAGS 39 and 40 for photodosimetry, change house and monitoring personnel.

In Operation WIGWAM Project 0.17 was established as the radiological support unit for Task Group 7.3, assigning to NRDL the main radiological safety functions of: (a) protection of personnel and equipment, (b) effective training of personnel, and (c) evaluation of the effectiveness of rad-safe training and radiac equipment.

Project 0.17 was organized into four main operating groups: Rad-safe training, personnel protection, instrumentation and dosimetry. The project was staffed by 45 personnel comprising of 6 NRDL health physicists, 5 AEC contractor health physicists, 27 BuShips personnel, and 7 naval enlisted personnel. The NRDL personnel functioned as the nucleus of Project 0.17 for the planning, logistic requirements (protective clothing and equipment, photodosimetry and instrumentation), establishing rad-safe training programs for 0.17 personnel and designated TG 7.3 personnel, and rad-safe operational support for Programs I, II and III. The organizational and operational experience from the CASTLE operation and the subsequent rad-safe experience of the WIGWAM organization afforded an adequate radiological support unit, providing a continuity for improving rad-safe services and instruments through the nucleus of the NRDL health physicists.

Operation REDWING, similar to Operation CASTLE in organization, provided over-all Task Force and rad-safe coverage through the TU-7 organization. Again, because the rad-safe requirements for the NRDL projects were of sufficient magnitude to require a support unit of 6 health physicists, 12 monitors and 2 photodosimetry personnel, Project 2.10b was organized. Project 2.10b was organized and patterned after Project 0.17 of Operation WIGWAM with the 3 NRDL health physicists forming the nucleus, drawing again from AEC contractors for 8 more health physicist and including 9 BuShips personnel and 8 naval enlisted personnel for monitors. The basic rad-safe logistic support was provided by TU-7, thus enabling Project 2.10b personnel to continue developing instrumentation, photodosimetry and rad-safe procedures to provide better rad-safe support.

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The 3 week rad-safe training program for Project 2.10b demonstrated that a 4 week course was required to adequately train BuShips and Navy enlisted personnel into an efficient rad-safe group. Operationally, the logistic support from TU-7 provided a minor obstacle in the supply of protective clothing. The radac instrumentation support from TU-7 and TG 7.3 afforded adequate coverage. Photodosimetry processing for the NRDL experimental film badge program was carried out with the help of the Air Force. One-half of the rad-safe coverage of Project 2.10b was for the operation and turn-around of the YAGS 39 and 40 as was also the case in Operation CASTLE. The balance of the rad-safe coverage for NRDL projects was accomplished adequately with support from TU-7 and TG 7.3.

Some of the radiological monitoring data from ships and barges positioned in the fallout pattern from previous operations are tabulated below to indicate the order of magnitude of the radiological situation:

Operation	Event	Vessel	Residual Dose- Rate H + 1 Calculated r/hr	# Decon Personnel	Avg. Whole Body Gamma Dose to Decon Per- sonnel in r
CROSSROADS	Baker	DD-419	730	-	-
CASTLE	Romeo	YAG-39	40	50	.180
CASTLE	Romeo	YAG-40	380	50	.350
WIGWAM	Wigwam	YAG-39	.450	-	-
WIGWAM	Wigwam	YAG-40	.310	-	-
REDWING	Tewa	YAG-39	27	30	0.570
REDWING	Tewa	YAG-40	14	30	0.570
REDWING	Tewa	YFNB-13	30	15	0.500
REDWING	Tewa	YFNB-29	1100	15	0.500

Residual gamma radiation intensities of about 1000 r/hr at H + 1 may be expected on the target fleet array on Operation HARDTACK. It is to be noted that Romeo was a water surface shot in the M range, Wigwam was a deep underwater shot of about 30 KT and Tewa was a water surface shot in the M range. The whole body gamma dosage was controlled by rotating personnel in the decontamination teams.

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In Operation HARDTACK the bulk of the rad-safe support will be committed to the Radex survey of the target fleet, recovery of experimental samples and equipment on the target fleet and the decontamination of the target fleet. This rad-safe support project would be a function of TG 7.3 that would support all parties involved with the target fleet, including the technical projects in TG 7.1. A group of health physicists and monitors would provide the rad-safe support and liaison between the TG 7.1 projects and the rad-safe support project. All logistic support to the TG 7.1 projects would be available through the APA Rad-Safe Center. The rad-safe support project would be an organization similar to Project 0.17 of Operation WIGWAM.

8. SPECIAL REQUIREMENTS AND CONDITIONS:

The personnel necessary to staff Target Fleet Radiological Support Unit will be:

- a. 3 health physicists from Naval Establishment to form the nucleus of the project.
- b. 7 health physicists from AEC contractors.
- c. 5 senior monitors from AEC contractors and 1 senior monitor from MRDL
- d. 14 BuShips civilian personnel to train as project monitors.
- e. 4 civilian electronic technicians (2 from AEC contractors and 2 from Shop 67, SFNS personnel).
- f. 4 naval enlisted corpsmen for photodosimetry work.
- g. 1 yeoman
- h. 5 naval enlisted personnel to run Change Station and for logistic support (supplied from APA).

The 39 personnel listed in (a) through (g) make up a Rad-Safe Group. Two Rad-Safe Groups will be organized, the second group to relieve the first group midway in the operation. Each group will function for 12 weeks (2 weeks travel, 4 weeks rad-safe training, 6 weeks at EPG), operating at the EPG during the period 5/19/58 through 8/7/58.

Helicopter and P2V-5 aircraft support will be necessary for early time Radex survey of the target fleet and adjacent areas.

The APA will serve as the rad-safe center for ship decontamination and base for operations for the Target Fleet Rad-Safe Project Office. Storage space ashore will also be required.

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9. JUSTIFICATION FOR FULL SCALE TEST:

Experience from previous field operations has demonstrated that the organization and operation of a Radiological Support Unit to supply the complete rad-safe services for all projects participating in the Target Fleet Studies will afford the maximum personnel and equipment protection compatible with these afloat studies. Operation WIGWAM showed the successful operation of such an organization and with the addition of a floating Rad-Safe Center the control of personnel working in and around contaminated ships along with the increased efficiency of decontamination parties will be realized. Again, since the bulk of rad-safe support will be in the recovery, inspection and turnaround of the ships of the Target Fleet, it is essential to have the complete logistic and operational rad-safe facilities under the Target Fleet Rad-Safe Unit to expedite rad-safe operation and to minimize processing of contaminated personnel.

10. FUND REQUIREMENTS:

Grand total - \$379,000. See attached sheets for detailed information.

11. PHOTOGRAPHIC AND SOIL STABILIZATION:

None.

12. ADDITIONAL INFORMATION:

Radio communication facilities will be required on the APA Rad-Safe Center capable of maintaining communications between: (a) early time Radex survey aircraft, (b) TG 7.3 boat pool dispatcher, and (c) the various radio nets of the target fleet projects requiring communications with the rad-safe project.

Boat transportation between the APA and the support ships and base island is necessary to transport the various support personnel compatible with the operational working schedule. This requirement includes the taxi boat schedule along with standby boat service for decontamination and other working parties. Land transportation will be required for movement of personnel and equipment for necessary support operations ashore.