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TASK UNIT SEVEN

TASK GROUP 132.1 OPERATIONS

RAD-SAFETY SUMMARIES

JF-243

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THIS DOCUMENT CONSISTS OF 77 PAGE'S

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FORWORD

The Rad-Safety Operational Summaries contained in this document have been prepared in order to assist in the writing of a TU-7 Operations Plan, and also to briefly acquaint members of the monitoring unit with Rad-Safety problems that may be expected during Operation Ivy. It must be pointed out that some discrepancies may exist between these Summaries and the final plan due to alterations in the Projects' Operational Plans and also to some misinterpretation of information supplied by the individual Program Directors and Project Officers.

Final changes to these plans will be made in the Forward Area; also at this time all members of TU-7 will be briefed on the individual Projects by the Program Director or his representative.

[redacted] [redacted]

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CODE FOR

RAD-SAFETY OPERATIONS SUMMARIES

1. Program - Title
2. Project - Title - (and names of a few responsible individuals).
3. Phase - (Some arbitrary subdivisions are made for Rad-Safety purposes, without reference to Project nomenclature.)
4. Objective - (A statement intended partly to give monitors an idea of the urgency of the Project.)
5. Number of Shots involved.
6. Approximate location and distribution of test equipments.
7. Desired time of collection - reason for early collection requirements - (to indicate degree of urgency).
8. Number of collection teams - number of men per team - supervision provided by Project for rad-safety purposes - estimated working time in hot areas.
9. Itinerary for collection - (Type of boat or aircraft, and information needed for location of Rad-Safety check points and estimation of traffic load).
10. Methods of handling active material; methods of getting in and out of hot areas.
11. Estimate of Rad-Safety requirements - (Instruments, protective clothing, services required of Rad-Safety Unit. This should include statement of items provided by Project that might otherwise be required of Rad-Safety Unit.)
12. Remarks:

[redacted]

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1. Program One - LASL - J-11 (ALC)
2. Project 1.1 - Yield Measurements (R. W. Spence)
3. One Phase.
4. To determine yield by analyzing fission and fusion fragments.
5. Both Shots.
6. Samples will be collected by manned aircraft on project 1.3 and will be returned to LASL by rush MATS flights. Sample removal and shipment will be made at Kwajalein atoll.
7. Not applicable.
8. Not applicable.
9. " "
10. " "
11. " "
12. The experimental procedures involved herein are essentially laboratory analysis techniques. The collection of the necessary samples and the immediate dispatching of these samples to the Los Alamos laboratories will be discussed under project 1.3.

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[redacted] SE[redacted]

1. Program One - (LASL - J-11) AEC
2. Project 1.2 - Internal Nuclear Detector Measurements (G. Cowan)
3. One phase only.
4. To recover detector elements selected on the basis of their nuclear reactions with neutrons and so placed within the device to indicate whether or not, and in what quantity, certain reactions in the chain of fission fusion events occur. Elements to be used include tungsten, rhodium, scandium, germanium, sodium fluoride, nickel, uranium and lead.
5. Mike shot.
6. Samples will be collected by manned aircraft of project 1.3 and will be returned to LASL by rush MATS flights. Sample removal and shipments will be made at Kwajalein atoll.
7. Not applicable.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

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[redacted]

1. Program One - (LASL - J-11) AEC
2. Project 1.3 - Sample Collecting (H. Plank)
3. Sample transfer phase.
4. To remove the transfer radioactive samples of the collection phase to transport aircraft for shipment to Los Alamos.
5. Both Shots.
6. Upon return of sample aircraft to Kwajalein, samples will be removed and prepared for air shipment to LASL. This transfer will be located in a selected area of the parking area.
7. Transfer of samples is to be accomplished as soon as practicable after landing.
8. Collection of snap samplers and filters will be accomplished by members of the project.
9. Not applicable.
10. Methods of handling active materials has been made by this project. This handling technique is dangerous since filters will have concentrated samples and plane surfaces will be contaminated.
11. Monitor service, protective clothing, instrumentation for fifteen men. Additional monitors may be obtained from TG 132.4.
12. Because of the hazard involved in this operation, remote collection devices, and protective gloves must be utilized. Rehearsal of operations is advisable from the viewpoint of reducing accidents and of determining actual exposure time.

[redacted]

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1. Program One - (LASL - J-11) AEC
2. Project 1.3 - Sample Collecting (H. Plank)
3. Collection phase.
4. To gather cloud samples by manned aircraft for projects 1.1, 1.2 and 7.3.
5. Both Shots.
6. Sixteen F-84G carriers will be maintained on Kwajalein, in order that a minimum of twelve will be operational for each test. Two B-29's or B-36's will be used as primary and alternate operational command posts. Control of these jet aircraft will be the responsibility of the project supervisor. The samples will be collected as high as possible and approximately one and a half hours after shot time.
7. At zero time, two of the spare jets will be in the shot area, ready to perform reconnaissance as required to establish:
   a) Base of the upper cloud.
   b) Lowest altitude of prominent features of the cloud created by wind shear.
   c) Lowest altitude at which a useful radiation intensity is present.

   This information will be relayed to control aircraft and will be used to determine proper take-off time and flight altitudes for the twelve carrier
8. Twelve F-84G aircraft will constitute the sample collection teams. Twelve pilots will be exposed to cloud radiation. Col. Carl Houghton of the project will provide the rad-safety supervision of these pilots. Working time in the cloud will be regulated by information the pilot gathers from a wing tip ionization chamber. This chamber's meter will give the pilot an indication of particulate sample strength thus far collected.

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9. Not applicable.

10. See sample transfer phase.

11. Rad-safety instruments will be furnished by the project and will consist of an intensity rate-meter mounted in the cockpit. The detector will have shielding equivalent to that afforded the pilot, and the meter will give a direct reading of dose rate to which the pilot is subjected at a given time. A total-dose meter assembly will also be mounted in the cockpit with appropriate shielding. This meter will give the pilot a direct indication of how many roentgens he has received.

To protect the pilot from ingestion of radioactive meterial, adequate precautions will be taken to filter any air that enters the pressurized compartment.

Film badges and dosimeters will be furnished pilots by TG 132.4.

Lead lined protective clothing may be furnished pilots to screen out soft gamma radiation.

12. Expected total dosage for efficient sample collection is approximately five roentgens. A special tolerance for both operations has been set at twenty roentgens. Efforts should be made to accomplish sample collection at a minimum exposure.

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[redacted]

[redacted]

1. Program One - LASL - J-11 (AEC)
2. Project 1.3 - Sample Collecting (H. Plank)
3. Sample return phase.
4. To get collection samples back to Los Alamos as quickly as possible for laboratory analysis outlined in projects 1.1, 1.2, and 7.3.
5. Both Shots.
6. Not applicable.
7. " "
8. " "
9. " "
10. " "
11. " "
12. Two MATS aircraft will be standing by at Kwajalein and at intermediate landing points to provide for rush air shipment. Transfers of samples to stand-by MATS aircraft at intermediate points will be under the direct supervision of JTF 132 liaison officers. Activity will not exceed 1 r/hr at 1 foot from the surface.

[redacted]

[redacted]

12

[redacted]

1. Program Two - AEC (NRL)
2. Project 2.1a - Alpha of th[redacted] (E. Krause)
3. One Phase.
4. To measure the logarithmic rate of rise of the nuclear reaction (alpha). This measurement, combined with other factors, is a measure of the yield.
5. One Shot (MIKE)
6. Two scintillation detectors will be placed just outside the steel case of the device next to th[redacted] The signal from these detectors will be fed to a recording station on Bogon 3000 yards away. Recording will be done on NRIK and NRIK fast-sweep oscilloscopes. A permanent record will be obtained by photographing the face of the recording oscilloscope.
7. As soon as radiation levels permit re-entry to Bogon.
8. One collection team - three men.
9. One three passenger helicopter will be required for entry to Bogon.
10. Film will be recovered from Bogon. Replacement personnel will be available for recovery.
11. Monitor service, protective clothing, film badges for nine men and pilots.
12. This project is one of a series of film recovery projects. The total estimated time of recovery is one day. A more detailed program of recovery is desirable. Film recovery time should be determined from a practice run.

[redacted]

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[redacted]

1. Program Two - ABC (NRL)
2. Project 2.1b - King Alpha (E. Krause)
3. One Phase.
4. To determine a reliable and relatively complete alpha versus time measurement.
5. One Shot (KING)
6. The bomb will be fired at some 5700 feet north of station 250 on Runit at an altitude of approximately 2000 feet. Two detectors will be placed on the north end of Runit, and their signals will be piped through three inch coaxial cable to recorders in station 250.
7. Re-entry when radiological conditions permit.
8. One collection Team - three men.
9. One three passenger helicopter to Runit.
10. Film will be recovered from Runit.
11. Monitor service, protective clothing, film badges for three men and pilot.
12. Time for recovery of film should be determined from a practice run.

[redacted]

[redacted]

[redacted]

1. Program Two - AEC (NRL)
2. Project 2.2 - Timing in the Fission Phase (E. Krause)
3. One Phase.
4. To determine the timing of the fission phase. Knowledge of this time is important as it tells us whether or not the process took place in the predicted fashion.
5. One Shot (ENIWETOK)
6. Signals will be observed directly with scintillation detectors at the 3000 yard recording station on Bogon, and indirectly by means of light detectors at Bogon which observe phosphors located on Klugelab. Photographs will be made of oscilloscope traces as permanent records.
7. Re-entry when radiological conditions permit.
8. One collection team - three men.
9. One three passenger helicopter to Bogon.
10. Same as project 2.1a.
11. " " " "
12. " " " "

[redacted]

[redacted]

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[redacted]

1. Program Two - AEC (NRL)
2. Project 2.3 - Rise of the [redacted] (E. Krause)
3. One Phase.
4. To measure the rise of the [redacted] reaction.
5. One Shot (LLKL)
6. [redacted]

The signals will be detected by the same means as Project 2.2, that is, both by observing the gamma rays at Bogon 3000 yards away and by activating phosphors close the the device and observing the phosphors at Bogon.

7. Same as project 2.1a.
8. " " "
9. " " "
10. " " "
11. " " "
12. " " "

[redacted]

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[redacted] DATA

[redacted]

1. Program Two - AEC (NRL)
2. Project 2.4 - Propagation of [redacted] E. Kreuse)
3. One Phase.
4. To study the method in which the [redacted]
5. One Shot. (MIKE)
6. [redacted]
7. Same as project 2.1a
8. " " "
9. " " "
10. " " "
11. " " "
12. " " "

[redacted]

[redacted]

17

[redacted]

1. Program Two - AEC (Sandia Corp.)
2. Project 2.5 - Measurement of Transit Time (C. B. McCambell)
3. One Phase.
4. To determine the elapsed time from the firing of the detonators to the initiation of the fission reaction. This time represents basic diagnostic information in that it indicates the relative criticality of the assembled active components when the initiator is crushed.
5. One shot (KING)
6. Two small radio transmitters are installed within the ballistic case of the weapon. The signals from these transmitters are monitored by four receivers, two located in each of two aircraft which accompany the dropping plane. Reception of signals are monitored by oscilloscopes which in turn are photographed for permanent record.
7. Not applicable.
8. " "
9. " "
10. " "
11. Monitors from TG 132.4.
12. The operational flight plans should be reviewed to determine actual flight during and after shot time.

[redacted]

[redacted]

1. Program Three - (Edgerton, Germeshausen and Grier (AEC))
2. Project 3.1 - Ball-of-Fire Yield (H. Grier)
3. One Phase.
4. To photographically measure the expansion of the ball of fire. Since the rate of expansion will increase with increasing yield, this measurement will give a relative measure of energy release.
5. Both Shots.
6. Nine Eastman cameras with various filter factors, focal lengths and speeds will be operated on Parry Island. There will be one Papatronic camera (single picture at a definite delayed time after zero) on Parry which is designed to give a quick measure of yield. There will be three Eastmans running at about 2000 frames/sec on Rigili and two Mitchell cameras, at about 100 frames/sec on a ship. Two cameras may be opereted on Bogallua. The cameras on Parry will be operated both on a tower and from a fall-out proof structure on the ground. Fall-out-proof structures will be used on Rigili and Bogallua.
7. Entry to Parry and Bogallua when radiological conditions permit.
8. Two men per team. Working time of two hours.
9. Helicopter from Kendova to Parry and to Bogallua. Return to Curtiss with film.
10. Film will be stored in fall-out proof buildings.
11. Protective clothing and instrumentation for four men and two monitors.
12. Preliminary survey will determine the necessity of monitor service.

[redacted]

[redacted]

1. Program Three - Edgerton, Germeshausen & Grier (AEC)
2. Project 3.2 - Cloud Phenomenon (H. Grier)
3. One Phase.
4. To photographically measure the cloud formation, rate of rise and dimensions, as these factors vary with time.
5. Both Shots.
6. Mitchell cameras at 50 frames/sec and slow speed aero cameras will be operated on Parry from a ship and from an aircraft in the vicinity of Kwajalein. The Parry cameras will be split between a tower and a fall-out-proof shelter with the Mitchells probably housed in the shelter.
7. Entry to Parry when radiological conditions permit.
8. Two men per team. Same as project 3.1.
9. Same as project 3.1.
10. " " "
11. " " "
12. " " "

[redacted]

1. Program Three - LASL - J-15 and GMX-9 (AEC)
2. Project 3.3 - Hot-Spot Observation (G. Felt - B. Brixner)
3. One Phase.
4. To determine the time at which [redacted]
5. One Shot (MIKE)
6. [redacted]

[redacted]

7. The film should be recovered during the M+6 to M+48 hour period.
8. One four-man team will be used for recovery.
9. L-13's or helicopters can be used for recovery.
10. Not applicable.
11. Protective clothing, dosimeters, film badges and a monitor for four men.
12. No comments.

[redacted]

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[redacted]

[redacted]

1. Program Three - LASL - GMX-9 (AEC)
2. Project 3.4 - Bomb Case Motion (E. Brixner)
3. One Phase.
4. To photographically observe by means of slow motion the device case displacement and early ball of fire growth.
5. One Shot. (MIKE)
6. [redacted] will make the observations for this project from the same station as built for the Bowen streak cameras on Project 3.3.
7. Same as project 3.3.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

[redacted]

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1. Program Three - EGG (Edgerton, Germeshausen and Grier)

2. Project 3.5 - Illumination as a Function of Time (H. E. Grier)

3. One Phase.

4. To augment the collection of data on illumination as a function of time from exploding atomic weapons.

5. Both Shots.

6. For MIKE shot, two GR-slit cameras will be operated on the Parry Island photo tower. For KING shot, one GR-slit camera will be operated on the Parry tower. In each case, the cameras will be started by means of an electrical pulse supplied by Edgerton, Germeshausen and Grier.

7. Entry to Parry when radiological conditions permit.

8. Same as project 3.1.

9. " "

10. " "

11. " "

12. " "

[redacted] [redacted]

1. Program Three - Edgerton, Germeshausen & Grier (AEC)
2. Project 3.6 - Bhangmeters (H. E. Grier)
3. One Phase.
4. To continue the development and calibration of the Bhangmeter which is a device designed to measure weapon yield during tactical operations.
5. Both Shots.
6. For KING shot, one Bhangmeter will be installed on the Parry Island photo tower, and another will be installed on the Estes. More may be placed at distant stations. For KING shot, Bhangmeters will be installed on the Parry Island photo tower.
7. Entry to Parry when radiological conditions permit.
8. Two men per team. Working time of two hours.
9. Same as project 3.1.
10. " "
11. " "
12. " "

[redacted] [redacted]

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[redacted]

1. Program Three - DOD (USAF)
2. Project 3.7 - Preliminary Photographic Crater Survey (J. L. Gaylord)
3. One Phase.
4. To obtain a preliminary photographic survey of the crater caused by MIKE shot, for use of study of earth shock.
5. One Shot (MIKE)
6. The preliminary survey will be conducted from aircraft with vertical cameras as soon as practicable after the explosion of the MIKE device. Efforts will be made to obtain vertical and/or vertical stereoscopic photographs which will yield information on the size of the crater and the height of the material thrown out around the crater lip.
7. As soon as radiological conditions permit.
8. Not applicable.
9. " "
10. " "
11. Monitor, instrumentation and film badges.
12. An aerial survey of the crater region should be performed. Altitude limits should be specified since overexposures can be quickly obtained at the lower levels. This could be a source of overexposure unless this operation is closely controlled.

[redacted]

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[redacted]

[redacted]

1. Program Three - ALC (L.G.&G.)
2. Project 3.8 - Burst Position (H.L. Grier)
3. One Phase.
4. To locate the position of burst (in space) by precise photographic techniques.
5. One Shot (KING)
6. The proposed bomb zero point is 1500 feet above the ground and 5700 feet due north of station 250 on HUNIT Island. The region in space which includes this point will be observed photographically by two survey cameras, one located on Coral Head and one located in the Parry Island photo tower.
7. Entry to Parry Island when radiological situation permits.
8. Two men per team - two teams.
9. Same as project 3.1.
10. " "
11. " "
12. " ".

[redacted]

[redacted]

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[redacted]

1. Program Four - AEC (LASL J-12)
2. Project 4.1 - Slow Neutron Observation (C. L. Cowan)
3. One Phase.
4. To determine the space distribution of low energy neutrons liberated by various sizes and types of atomic bombs. This neutron measurement program is designed to augment existing data on neutrons and to continue the development of field measurement techniques.
5. Both Shots.
6. For MIKE Shot, pairs of tantalum and gold samples will be placed on a line extending along the reef toward Bogallua. The first pair will be 100 yards from zero, others to 2500 yards placed at 100 yard intervals. For KING shot, the line of samples will start on the reef (300 feet from proposed zero) and extend down the center of Runit about 7200 feet from ground zero.
7. Recovery parties have to enter the area and islands which lie generally west of the shot island for MIKE as soon as will be permitted. This time requirement also applies for KING shot.
8. Recovery will require the services of a caterpillar tractor and operator to drag in the recovery cable. Will probably be accomplished by two parties.
9. Entry will require water transportation from Parry Island to the reef edge near Cochiti. Transportation there will be in the form of two DUKWS to the island and to adjacent reef areas. Similar entry is contemplated for KING shot. [redacted]
10. Two sample recovery techniques have been planned: one being to fasten samples to a cable which can be hauled in after the shot, the other being to place the samples on a fixed pylon and to retrieve them by helicopter. After recovery the samples will be shipped to Los Alamos.

[redacted]

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[redacted]

[redacted]

11. Protective clothing and instrumentation for four to five men. Two monitors.

12. More detail of recovery operations and personnel involved should be obtained for adequate planning purposes.

[redacted]

[redacted]

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[redacted]

1. Program Four - AEC (LASL J-12)
2. Project 4.2 - High Energy Neutron Observation (C. L. Cowan)
3. One Phase.
4. To document the flux of neutrons exhibiting energies considerably higher than .25 EV.
5. Both Shots.
6. For MIKE shot, sulphur zirconium, and iodine samples will be placed at the same positions mentioned under project 4.1. In addition, a few samples of zirconium may be placed on Bluegelab - in line with the collimator holes mentioned under project 2.3 - out to a distance from zero of approximately 800 yards.

   For KING shot, sulphur samples will be placed at the same positions as the tantalum samples under project 4.1 (KING SHOT)
7. Same as project 4.1.
8. " "
9. " "
10. "
11. "
12. " "

[redacted]

[redacted]

[redacted]

1. Program Four - AEC (LASL J-12)
2. Project 4.4 - Neutron Intensity as a Function of Time (C. L. Cowan)
3. One Phase.
4. To gain information as to the total number of arriving neutrons versus time at given fixed distances from bomb zero by means of "fission-catcher-cameras.
5. Both Shots.
6. For MIKE shot, three fission catcher cameras will be located in San Ildefonso Island approximately 1200 yards from zero. For King shot, an identical installation will be made on the north end of Runit Island.
7. Two men to enter San Ildefonso Island when radiological conditions permit.
8. Two men per team. One recovery team.
9. Helicopters can be used for recovery.
10. Not applicable.
11. Protective clothing, dosimeters, film badges and monitor for two men.
12. Time of recovery operations should be determined prior to shot.

[redacted]

[redacted]

[redacted]

1. Program Five - AEC (LASL)
2. Project 5.1 - Total Dose (L. Storm)
3. To supply information as to the total gamma dose received by points located at various distances from bomb zero. This experimental project is part of a continuing program, the purpose of which is to obtain as much documentation as possible of the gamma radiation fields established by exploding atomic weapons.
5. Both Shots.
6. For MIKE shot, two measurement lines will be established - one from Elugelab to the far end of Bogallua, and one from Elugelab to the far end of Engebi. The packet positions will be on land only, and will be spaced at one hundred yard intervals insofar as possible. Three film badges will be placed at each position; the first of which remains openly exposed to radiation until recovery. The second and third badges will be openly exposed initially, but will later drop into prepared shielded positions. The second dropping 0.2 seconds after the explosion and the third dropping 60 seconds later. A crude time resolution of the total dose will be obtained. The spreading of contamination by a base surge may be documented in this fashion.

   For KING shot, a line of film badge stations will be placed down the middle of RUNIT - spaced at approximately one hundred yard intervals. Each station will consist of a post to which one or more film badges is attached. All badges will be openly exposed until recovery.

[redacted]

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7. Recovery as radiological conditions permit.

8. Three to five men to make collection from Bogallua to Elugelab, and from Engebi to Elugelab.

9. Collections will be made by DUKW.

10. Film badges will be collected with shields and decontaminated before removal from packet.

11. One monitor, protective clothing, dosimeters, film badges for each team.

12. Collection phase may extend over several days since some film may be located within high contamination areas.

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[redacted]

1. Program Five - ALC (LASL - J-13)
2. Project 5.2 - Gamma Intensity as a Function of Time. (J. S. Malik)
3. One Phase.
4. To measure the time dependence of gamma ray intensity (at certain fixed distances) from shortly after zero time to plus thirty seconds. This experiment is designed to start at 0.2 micro-second for MIKE shot and to extend for approximately 30 seconds - thus measuring the time dependence of the major portion of the delayed gammas.
5. Both Shots.
6. For MIKE shot, gamma intensity versus time measurements from 1 ms to 30 seconds will be made on four islands - Cochiti, San Ildefonso, Bogombogo, and Kuchi.

   For KING shot, three measurement assemblies will be placed upon Runit - at varying distances from bomb zero. Time coverage from 1 ms to 30 seconds.
7. Desireable to make recovery as soon as radiological conditions permit.
8. Three men to make collection from above Island.
9. One helicopter used for collection at above mentioned islands.

   Or one DUKW to be used for above collection.
10. Not applicable.
11. One monitor, protective clothing, dosimeters, and film badge for collection team.
12. More information must be obtained from project director as regards reentry requirement.

[redacted]

[redacted]

1. Program Five - AEC (LASL - J-13)
2. Project 5.3 - Fall-out Gamma Intensity (J. S. Malik)
3. One Phase.
4. To further the documentation of fall-out intensity versus time at various fixed points. The ultimate theoretical goal is the development of an adequate theory for prognostication of the fall-out-induced dose rate at any point.
5. One shot (NIKE)
6. Recording devices will be installed on Bogallua, Rigili, Parry, Eijiri, Engebi, Kunit and Bogon islands. The records from Engebi and Bogon will be telemetered so that initial recovery teams may know the personnel hazard existent in the northern part of the atoll at that time. It is planned to install such monitoring devices on some ten other atolls in that part of the Pacific.
7. Desireable to make recovery as soon as radiological conditions permit.
8. One collection team of two or three men to collect record charts.
9. Speedboat or helicopter to above mentioned islands.
10. Not applicable.
11. One monitor, protective clothing, dosimeters, and film badges for three men.
12. Same as project 5-2.

[redacted]

[redacted]

1. Program Five - DOD (USN)
2. Project 5.4a - Fall-out Intensity and Particle Size

   (W. D. Heidt)
3. One Phase.
4. To extend the measurement of fall-out distribution and magnitude following MIKE shot to distances greater than those being documented by Project 5.3, to determine, at a limited number of close stations, the rate of arrival of inert liquid or solid materials and associated radioactive materials, to obtain data on size distribution and chemical nature of the active fall-out particles, to correlate the fall-out pattern obtained with that predicted from a knowledge of meteorological conditions and atomic cloud behavior, to calculate fall-out induced radiation intensities and total dose.
5. One shot, possibly both.
6. The land-based station array within the atoll will be located on Bogallua, Lngebi, Yeiri, Piireai, Runit, Aniyaanii, Parry, Eniwetok. Other Stations will be located on islands outside of the atoll. It is also planned to use a number of anchored rafts as instrument stations within the lagoon. Some collection devices will be established aboard at least one vessel of each Task Force Unit.
7. It is desirable to start recovery operations by M + 2 or M + 3. The determining factor will be an evaluation of the total dose allowed per person.

[redacted]

[redacted]

8. The project will employ five recovery teams consisting of two men each. Two of the teams will be engaged in the collection of samples from 20 moored floats within the lagoon. It is estimated that recovery can be completed in eight hours if a high speed boat is used.

9. Two of the teams will collect samples from the following island stations: Enjwetok, Parry, Aniyaanii, Runit, Piiraai, Yeiri, Engebi, and Bogallua. Samples can be collected in not over an hour after arrival at the island. The fifth team will be a reserve unit. Lagoon collection will utilize speed boats or pontoon equipped helicopters. Two teams cover eight islands in two days.

10. The samples collected will be solid and liquid. The liquid will be collected in polyethylene bottles and upon removal the bottles will be placed directly into prepared shipping containers. The dry particulate containers will be sealed in place and also placed in special shipping containers.

11. Protective clothing, dosimeters, film badges and four monitors will be required for eight men of this project.

12. Each team will have at least one person capable of appraising the radiological hazards. These men may be available within the project as additional monitors.

[redacted]

1. Program Five - DOD (USA)
2. Project 5.4b - Particle size measurements (L. Bouton)
3. One Phase.
4. To obtain total activity in the particulate material, rate of fall-out and the fall-out pattern on land areas of Eniwetok Atoll and to determine the air-borne concentration of the radioactive particulate material near ground level over land areas of Eniwetok Atoll, the size distribution of gross and radioactive particulate matter, the distribution of activity with particle size, the presence of selected fission products in the particulate matter, the adequacy of aerial survey systems in assessing the ground contamination situation.
5. Both Shots.
6. The collection of the necessary samples will be accomplished by sampling aircraft for air samples and the intermittent fall-out sampler and electrostatic precipitator for ground samples. Air sampling will be accomplished by Project 7.3 using F-84G aircraft. The intermittent fall-out samplers will be located on various islands of the atoll: Bogallua, Bogombogo, Ruchi, Bogon, Engebi, Muzin, Kirinian, Bokonaerappu, Yeiri, Aitsu, Rujoru, Eberiru, Aomon, Biijiri, Runit, Japtan, Parry, Eniwetok, Igurin, Giriinien, Migili, Coral Head and an artificial island. Electrostatic precipitators will be located on Engebi, Eberiru, Biijiri, Runit, Japtan, Parry and Eniwetok.
7. Project 5.4b requires entry at H hour to begin sample collection. Early collection is required in order to return the samples to Army Chemical Center with plane scheduled for departure at H + 2 days. Considerable time will be required in preparation for this shipment.

[redacted]

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8. The project will use three men teams in the contaminated area. It is estimated that eight hours will be required.

9. Two helicopters will be used for collection.

10. Radioactive materials will be handled in prepared sample containers.

11. Clothing, film badges, dosimeters and two monitors will be required for six men.

12. Aerial survey data will be obtained with survey meters equipped with recorders. It is planned that this data be taken by a Rad-Safety monitor and made available to project. Information is required on altitude, flight path, air speed, estimated ground speed, location relative to the ground, etc.

[redacted]

1. Program Six - AEC (Sandia Corp.)
2. Project 6.1 - Pressure vs time on the Ground (H. E. Leanander)
3. One Phase.
4. To augment the existing fund of experimental data in the understanding of the means by which the surface perturbs the pressure field - as a function of pressure, time characteristics of the reflecting surface, characteristics of the atmosphere above the surface.
5. Both Shots.
6. For MIKE shot, Wiancko air pressure gauges will be placed at thirteen positions around the eastern side of the atoll:

Teiteriripucchi	- 4422 ft.	from ground zero
Bogairikk	- 5900 "	" " "
"	" "	" " "
Bogon	- 8250 "	" " "
"	- " "	" " "
Site Noah	- 11,490	" " "
Engebi	- 15,900	" " "
Muzin	- 21,412	" " "
Bokonaarappu	- 30,130	" " "
Aomon	- 47,574	" " "
Parry		
Aitsu		
Runit	- 74,884	" " "

[redacted]

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[redacted]

Recording stations will be established at Bogon, Engebi, Muzin, Bokonaarappu, Aomon, Runit, Parry.

For KING shot the same type of gauge will be used and two measurement lines will be established - one over water and one over land. For the former, gauge mounts will be located on fifteen foot towers located at 2500, 3000, 4000, 5000, 6000, 7000, 10,000 and 15,000 feet from ground zero. The line will extend along the reef to the south. The land line will be established on Runit with stations at 3000, 5000, 5000, 7000, 7000, 9678, 9678 feet from ground zero. One station on Parry, measurements will be recorded at Runit and Parry.

7. Reentry to recording stations as soon as radiological conditions permit.
8. Three men per team.
9. Heliocopter to above named stations.
10. Not applicable.
11. Monitor, protective clothing, dosimeters, film badges will be needed.
12. Number of teams and time of recovery must be obtained from project.

[redacted]

40

1. Program Six - LASL - J-10 (AEC)
2. Project 6.2 - Air Mass Motion Studies (F. B. Porzel)
3. One Phase.
4. To determine free air over pressures versus distance curves.
5. Both shots.
6. Ten AA guns will be located on Janet Island. For MIKE shot, low altitude (400 feet) labeling of the air will be accomplished with exploding mortar projectiles. The distances from zero will be similar to those of the Wiancko gauges of project 6.1. Most of the mortars will be mounted on ten foot square rafts and placed in the lagoon. The mortar produced puffs will be photographed by ten Mitchell cameras - from vantage points on Engebi, Rojoa, Runit, and Parry.

   In addition, the air will be labeled with smoke at ten altitudes above the bomb (5,000; 6,000; 10,000; 11,000; 15,000; 16,000; 20,000; 21,000; 25,000; 26,000 feet) by means of bursting shells from guns. The guns will be placed on Janet (Engebi). All guns will be fired with timing signals furnished by E.G.&G. The gun-produced puffs will be photographed by five Mitchell cameras from the photo station on Ursula (Rojoa).

   For KING shot, only the low altitude (400) feet air labeling technique will be used. Eight mortars will be placed on a line running approximately Northwest from ground zero, the nearest being at 4,000 feet and the most distant being at 15,000 feet. The puffs will be photographed from Ursula.

[redacted]

41

[redacted]

[redacted]

7. In case of misfire (unlikely), two men plus a monitor will enter the area for a half hour to unload gun and dispose of ammunition.

8. One team will be used, consisting of two men and a monitor.

9. Collection program in case of misfire will be by LCM-boat to Janet and truck or jeep from landing to guns and return.

10. None, except rough decontamination of equipment prior to return.

11. One monitor, protective clothing, film badges, dosimeters for two men, monitor, and LCM boat crew.

12. None

[redacted]

[redacted]

1. Progrem Six - Sandia Corp. - J-10, LASL (ALC)
2. Project 6.3 - Shockwind, Afterwind, and Sound Velocity (H.E. Lenander)
3. One Phase.
4. To measure shock winds and after winds at various distances from ground zero; to measure sound and material velocities, both prior to and after shock arrival, at various distances from ground zero.
5. Both Shots.
6. For MIKE shot, Group J-10 of LASL will measure both sound and inward directed wind velocities - using Sonic Anemometers. These measurements will start at the end of the positive phase (at a given station) and extend for approximately ten seconds. The instrument locations will be as follows:

Station 630.01 - Engebi - 19,363 feet from ground zero.
" 630.02 - Kirinian - 24,104 " " " "
" 630.03 - Bokonaaru.pu - 30,734 " " " "
" 630.04 - Biijiri - 51,008 " " " "

The possible participation of this group in the KING shot program is as yet unsettled.

The Proving Ground Department of the Sandia Corporation will also measure sound and wind velocities for both MIKE and KING shots. Their instruments will be mounted on, and the recording will be done in Bogairikk, Bogon, Engebi, Luzinbaarikku, Bokonaarappu, Aomon, Parry and Rumit.

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[redacted]

7. Project 6.3 desires to enter Janet (Lngebi), Lucy (Kirinian), Mary (Bokonaarappu), and Sally (Aomon) to recover photographic records. Two days may be required. Not time limit exists MR + 2 and + 3 are suggested. For KIKG, only Sally will be visited.
8. One team will be used consisting of two men and a monitor. Thirty minutes at each station.
9. LCM to Janet, Lucy Mary and Sally by jeep or truck from landing to station on each island and return. For KIKG, only Sally will be visited.
10. None.
11. Services of a monitor, protective clothing, film badges, dosimeters for two men, monitor and boat crew.
12. None.

[redacted]

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1. Program Six - J-10, LASL (AEC)
2. Project 6.4a - Water Wave Motion - Shallow Water - Photo (W. D. Baker)
3. One Phase.
4. To document water surface motions within the lagoon.
5. One Shot.
6. Both the wave length and amplitude of lagoon water waves will be observed photographically. To make such a technique feasible, the water surface will be labeled with floats. Each float will be located within the fixed field of view of a Mitchell camera. The fields of view of those Mitchell cameras arranged to observe mortar produced smoke puffs will include the water surface. Three additional cameras will be located on Engebi, Runit, and Bijiri. The above instrumentation will allow documentation of lagoon water surface motions in the vicinity of Parry, Runit, Rogoa, and Engebi.
7. E. G. & G. will recover film.
8. Not applicable.
9. " "
10. None
11. "
12. "

45

[redacted] DATA

1. Program Six - ONR, Scripps Institute (USN)
2. Project 6.4b - Sea Waves (J. W. Smith)
3. One Phase.
4. To measure surface water waves generated outside Eniwetok Atoll.
5. One Shot. (MIKE)
6. Two Scripps Institution of Oceanography vessels, "Horizon" and "Spencer F. Baird" will be used to plant pressure measuring instruments on the 4500' terrace adjoining Eniwetok on the north and on other submerged sea mounts in the area at distances up to 75 miles. "Tsuami" recorders may be placed in the water off convenient islands in the Pacific.
7. Reentry when radiological conditions permit.
8. Not applicable.
9. " "
10. " "
11. " "
12. " "

[redacted]

1. Program Six - ALC (Sandia Corp)

2. Project 6.5 - Ground Motion - Seismic Measurements (H. L. Lenander)

3. One Phase.

4. To document the transport of energy by the ground through the use of earth acceleration and resulting motion records. Documentation of these as a function of distance from bomb zero may make possible the theoretical deduction of how much energy was ground-transported.

5. One Shot (MIKE)

6. Measuring stations will be established on Parry, Biijiri, Bokonaarappu, Muzin, Engebi, and Bogon. These stations will consist of Wiancko accelerometers.

7. Reentry when radiological conditions permit.

8. Three men and a monitor to recover accelerometer records at above mentioned measuring stations.

9. Speedboat to Parry, Biijiri, Bokonaerappu, Muzin, Engebi, and Bogon.

10. Not applicable.

11. Protective clothing, film badges, dosimeters and one monitor will be required.

12. Time period of collection must be determined prior to entry.

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[redacted]

1. Program Six - DOD (USN)
2. Project 6.7a - Underwater Pressures across the Lagoon and in Deep Water.
3. One Phase.
4. To make a limited number of peak water pressure measurements along a line from ground zero through the center of the lagoon. In addition, the pressure time history of the underwater shock wave, in the deep water immediately outside of the reef northwest of the shot island, will be obtained.
5. One Shot (MIKE)
6. A minimum of four pressure measuring and recording systems will be moored below the surface of the deep water immediately adjacent to the reef northwest of Elugelab. Scripps Institute vessels will retrieve records and unit.
7. Recovery when radiological conditions permit. Preferably with M + 4.
8. Not applicable.
9. " "
10. " "
11. One monitor per ship - instrumentation and representative film badges. Monitors will be assigned to each ship.
12. Efforts should be made to keep ships free of contaminating currents.

[redacted]

1. Program Six - AEC (Sandia Corp)

2. Project 6.7b - Underwater Pressures - Along Reef (H. E. Lenander)

3. One Phase.

4. To measure the pressure as a function of time in the shallow water of the lagoon. Various distances from comb zero will be instrumented in order that pressure attenuation with distance can be documented.

5. One Shot (MIKE)

6. These gauges will be placed in the lagoon 1/4 to 1/2 mile from land. The actual location will be off Parry, Biijiri, Engebi, and Bogairikk. Recording of the data obtained by these instruments will be accomplished in project 6.1 recording stations.

7. Same as project 6.1.

8. " "

9. " "

10. " "

11. " "

12. " "

[redacted] SE[redacted]

1. Program Six - DOD (USN)
2. Project 6.7c - Acoustic Pressure Waves in Water (J. W. Smith)
3. One Phase.
4. To make special observations at several SOFAR (sound fixing and ranging) stations in the Pacific area, of acoustic signals propagated in deep water.
5. Both Shots.
6. Navy SOFAR and SOFAR and SOFAR Research Stations, presently operating in the Pacific and Atlantic areas, will be used for special observation and analysis of the acoustic signals received during the shot period of Operation IVY.
7. Not applicable.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

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[redacted] [redacted]

1. Program Six - J-10 LASL (ALC)

2. Project 6.9 - Air Density versus Time (Pedro R. Flor Cruz)

3. One Phase.

4. To document the air density at various fixed points in the blast field - prior to, during, and subsequent to the passage of the shock wave.

5. Both shots.

6. To accomplish the objective a beta-ray densitometer will be used. A beta ray source of known intensity will be observed by a phosphor-photocell type of detector at an approximate distance of 50 cm. An air density increase or decrease will thus cause a decrease or increase of beta radiation incident upon the phosphor. By means of further instrumentation film records are obtained of air density versus time along the path. For MIKE shot, four beta ray densitometers will be used, one each of the following islands: Engebi, Kirinian, Bokonaarappu, and Aomon. The distances from bomb zero to these stations will be approximately 20,000; 25,000; 30,000; and 50,000 feet respectively.
It is planned to use two densitometers for KING shot - both of which will be located on Runit.

7. Project 6.9 desires to enter Janet (Engebi), Lucy (Kirinian), Mary (Bokonaarappu) and Sally (Aomon) to recover photographic records. Two days may be required. To time limitation exists. MK + 1 and + 2 days are suggested. For KING, only Sally will be visited.

[redacted] [redacted]

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8. One team will be used consisting of two men and a monitor. Working time will be about thirty minutes at each station.

9. Itinerary of collection will be by LCM to Janet, Lucy, Mary, and Sally, and by jeep or truck from the landing to the station on each island and return. For KING, only Sally will be visited.

10. Three 1 curie Sr^{90} beta sources will be installed at each of the four stations. These will be handled by means of special loading and unloading clip magazines.

11. The services of a monitor; film badges, dosimeters and protective clothing for two men, monitor, and boat crew. Periodic monitoring from K - 30 to K + 15 of the twelve beta sources and their associated handling equipment at the base camp will be required.

12. Sources should be monitored prior to use. Project monitors should damp swipe test each source after being subjected to pressure differences, blast effects, or any physical violence that may break the seal. Adequate precautions will be taken by the person during the swipe test in case leakage has occurred.

[redacted]

1. Program Six - DOD (USAF)
2. Project 6.10 - Free Air Pressure as a Function of Time (Rod Rudenberg)
3. One phase.
4. To determine the free air pressure as a function of time using manned aircraft to position the measuring instruments in space at altitudes significant to delivery aircraft. In addition, data on the dynamic structural response of aircraft will be obtained.
5. Both Shots.
6. The instrumented aircraft will orbit the zero point at a safe distance until just prior to the detonation, at which time they will turn so as to be flying directly away from ground zero at the time of detonation.
7. Not applicable.
8. " "
9. " "
10. " "
11. Monitor from LG 132.4.
12. Same planes as used in project 8.5. One B-36D and one B-47B.

[redacted]

[redacted]

1. Program Six - DOD (USAF)
2. Project 6.11 - Free Air Pressure as a Function of Time Utilizing Parachute Suspended Canisters. (J. B. Vann)
3. One Phase.
4. To measure the free-air over-pressure versus time, at a number of different known altitudes and distances from an atomic bomb explosion. Data on the attenuation of a shock wave in a non-homogeneous atmosphere will be obtained to aid in the determination of safe procedures for aircraft delivery of high yield atomic weapons.
5. Both Shots.
6. Twelve parachute-suspended canisters will be dropped on each shot, from two B-29 aircraft, flying at approximately 32,000 feet. Each canister will contain a pressure sensitive element, a thermal sensing device, and a telemetering transmitter. The position of each canister is to be determined by an electronic system known as MOTS (Multiple Object Tracking System). There will be two such MOTS installations aboard a ship of the evacuation fleet.
7. Not applicable.
8. " "
9. " "
10. " "
11. " "
12. Monitor to be furnished by TG 132.4.

[redacted]

[redacted]

1. Program Seven - AFCAT-1 (USAF)
2. Project 7.1 - Electromagnetic Effects from Nuclear Explosions (M. H. Oleson)
3. One Phase.
4. [redacted]
5. [redacted]
6. [redacted]

DELETED

7. Not applicable.
8. None.
9. None.
10. None.
11. None.
12. Not involved in rad-safey operations.

[redacted]

55

[redacted]

1. Program Seven - AFOAT-1/Signal Corp (USAF/USA).
2. Project 7.2 - Airborne Low-Frequency Sound from Atomic Explosions (G. D. Olmstead)
3. One Phase.
4.

[redacted]

5.
6.

7. Not applicable.
8. None.
9. None.
10. None.
11. None.
12. Not involved in Rad-Safe operations.

[redacted]

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[redacted]

1. Program Seven - AFOAT-1 (USAF)
2. Project 7.3 - Calibration Analysis of Close-in A-bomb Debris (L. Singlevich)
3. One Phase.
4. [redacted]
5. DELETED
6.

[redacted]

57

[redacted]

[redacted]

[redacted]

[redacted]

DELETED

[redacted] [redacted]

[redacted]TA [redacted]

59

[redacted] DRIA

[redacted]

[redacted]

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[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

1. Program Light - AEC (NRL)
2. Project 8.1 - Integral Thermal Radiation (H. S. Stewart)
3. One Phase.
4. To determine Q as a function of R in the equation $Q = \frac{FY}{4\pi} \cdot \frac{T}{R^2}$ where Q is the total incident radiation in calories /sq. cm., Y is the total energy release of the bomb in calories, F is the fraction of the bomb's total energy that is in the form of thermal radiation. R is the distance in centimeters from the bomb to the surface upon which radiation is incident. T is the transmission or the fraction which reaches the surface under consideration.
5. Both shots.
6. For MIKE shot, six ballistic thermocouples will be operated, two from the Parry photo tower, two from station 801 on Engebi and two from station 803 on Eijiri. In addition, "black ball" stations will be placed on Eijiri, Bogalla, Aitsu, Bokonaarappu, Kirinian, Engebi and Bogon (Noah). For KING shot, six thermocouples will be used. Two on the Parry photo tower, two in station 803 on Eijiri, and two mounted on a 12 x 12 foot platform on Aniyaanii. In addition three "black ball station" will be established near the north end of Runit.
7. Desire reentry as soon as radiological conditions permit.
8. Three men per collection team.
9. Helicopter to above mentioned islands.
10. Not applicable.
11. Monitor, protective clothing, dosimeters, film badges for three men.
12. Project leader should be contacted for number of parties and time of recovery.

[redacted]

[redacted]

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[redacted]

1. Program Light - AEC (NRL)
2. Project 8.2 - Thermal Intensity as a Function of Time (H. S. Stewart)
3. One Phase.
4. To document transmission as a function of energy and atmospheric conditions. To investigate the time dependence of total thermal radiation.
5. Both shots.
6. For MIKE shot, stations 800 on Engebi and 803 on Biijiri will each contain the following thermal radiation versus time measuring equipment: (1) two high speed bolometer assemblies (2) two photocell recorders - one sensitive to violet and one in the red portion. (3) One or two of above mentioned non-electronic instruments.
   For KING shot, station 803 on Biijiri will be reactivated to take the same measurements as mentioned above for MIKE. In addition, these measurements will be duplicated from the 25 foot tower on Aniyaanii.
7. Reentry when radiological conditions permit.
8. Three men will constitute a recovery team and will recover thermal records from Engebi and Biijiri.
9. Speedboat or helicopter recovery is preferred for KING shot. Biijiri will be visited.
10. Not applicable.
11. Protective clothing, dosimeters, film badges and one monitor will be required.
12. Contamination due to MIKE may make station 803 on Biijiri unavailable for KING shot thermal radiation measurements.

[redacted]

[redacted]

1. Program Eight - AEC (NRL)
2. Project 8.3 - Spectroscopy (H. S. Stewart)
3. One these.
4. To obtain as much information as possible concerning the thermal radiation spectrum associated with exploding atomic bombs. Both integral and time dependent spectra will be measured.
5. Both Shots.
6. For MIKE shot, moving film spectrographs will be installed at station 800 on Engebi and 802 on Bijiri. Another instrument will be located in a small room directly below the photo tower cab on Parry Island. For KING shot, the above mentioned Bijiri and Parry installations will be activated.
7. Recovery as radiological conditions permit. Criticality of project increases with time.
8. One team of three men.
9. Helicopter to Parry, Bijiri, and Engebi.
10. Not applicable.
11. One monitor, protective clothing, dosimeters, film badges for three men.
12. Project leader should be contacted for further details on time of recovery.

[redacted]

[redacted]

1. Program Light - AEC (NRL)
2. Project 8.4 - Air Attenuation (H. S. Stewart)
3. One Phase.
4. To add to the knowledge of the effective range of electromagnetic radiation in the atmosphere as a function of energy and the atmosphere's ambient conditions.
5. Both Shots.
6. Transmissometer (source, detector, and recorder) assemblies will be operated over several light paths. For MIKE shot, searchlights will be mounted approximately 100 feet above sea level on the Parry photo tower, and the associated receiver will be on Bluegelab. A similar set-up will be used between Bogon and Bogallua. This pair of transmissometer assemblies will monitor the air attenuation along their lines of sight at all times prior to the shot, and they will be made a part of the "go-no-go" system in the firing circuit.

   For KING shot, an attempt will be made to measure air attenuation between bomb zero and the thermal stations on Parry, Aniyaanii, and Biijiri, until some hours prior to the shot.
7. Not applicable.
8. " "
9. " - "
10. " "
11. " "
12. " "

[redacted]

64

[redacted]

1. Program Eight - DOD (ADC)
2. Project 8.5 - Thermal Radiation as a Function of Time in Free Air Utilizing Manned Aircraft (R. Nudenberg)
3. One Phase.
4. To determine, in free air at altitudes significant to delivery aircraft, the thermal radiation intensity as a function of time, and the maximum associated radiation-induced aircraft skin temperature.
5. Both Shots.
6. Attenuation measurements will be made over a two week pre-shot period using similar equipment in a B-29, to determine air transmission properties under conditions similar to those existing at shot time.
7. Not applicable.
8. " "
9. " "
10. " "
11. Air monitor personnel will be required. Clothing, badges and dosimeters.
12. Position of plane at shot time and activities following shot time are required to determine the nature of hazard of this operation.

[redacted]

67

[redacted]

1. Program Nine - AEC (LASL - J-12)
2. Project 9.1 - Electromagnetic Signals (C. L. Cowan)
3. One Phase.
4. To document the longer wave length spectrum of an atomic explosion. This experiment is part of a continueing effort to understand how, why and where the radio signal is generated.
5. Both Shots.
6. Recording equipment of the untuned antenna variety will be operated at Parry Island and at Los Alamos.
7. Not Applicable.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

[redacted]

1. Program Nine - Signal Corps (USA)
2. Project 9.2 - Effects on the Ionosphere with Respect to the Propagation of Radio Waves (F. B. Daniels)
3. One Phase.
4. To determine the effects of an atomic explosion on the ionosphere with respect to the propagation of radio waves.
5. Both Shots.
6. Recorders will be operated at Parry and Bikini Islands. Observations will also be made at Guam, Honolulu and other locations.
7. Not applicable.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

[redacted] [redacted]

1. Program Nine - DOD (USA)
2. Project 9.3 - Investigation of Electromagnetic Radiation throughout the Radio Spectrum Caused by an Atomic Explosion (F. Brown)
3. One Phase.
4. This project will attempt further quantitative investigations of the electromagnetic pulse caused by atomic explosions, recording sufficient data over a wide band of search frequencies to support a theoretical study of the phenomenon.
5. Both Shots.
6. A spectrum analysis of the radiated pulse will be made on Kunit and Parry Islands. Observations will also be made at such stations at Hawaii, Adak, Okinawa, Bikini, Kwajalein, Guam, Japan and Belmar, N.J.
7. Re-entry when radiological conditions permit.
8. Not applicable.
9. " "
10. " "
11. " "
12. " "

[redacted] [redacted]

70

[redacted]

1. Program Nine - DOD (USAF)
2. Project 9.4 - Evaluation of Indirect Bomb Damage Assessment Techniques (Rod Rudenberg)
3. One Phase.
4. To evaluate components of the IBDA which is installed in aircraft scheduled to participate in Projects 6.10 and 8.5.
5. Both Shots.
6. Basic radar equipment of the B-36D, the B-47B and any available B-50's and B-29's will be utilized.
7. Not applicable.
8. " "
9. " "
10. " "
11. See Project 6.10 and 8.5.
12. " " " " "

[redacted]

1. Program Ten - AEC (Edgerton, Germeshausen and Grier)

2. Project 10.1 - Timing and Firing (H. L. Grier)

3. One Phase.

4. This project is responsible for supplying all timing signals, and for supplying the firing pulse to the detonators of the [redacted] shot weapon.

5. Both Shots.

6. Central timing station will be located on the Estes.

7. Not applicable.

8. " "

9. " "

10. " "

11. " "

12. " "

72

[redacted]

1. Program Ten - AEC (Sandia Corp)
2. Project 10.2 - Release Tone (C. B. McCampbell)
3. One Phase.
4. To furnish the starting signal to Edgerton, Germeshausen and Grier's sequence timer in order that the timing signal system may be put into operation.
5. One Shot (KING)
6. Two transmitters will be operated in the dropping aircraft, a normally-closed switch being located in the "ground" line of each. These switches are opened when the bomb is released. A relay coil is connected to an associated receiver.
7. Not applicable.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

[redacted]

1. Task Unit Nine - DoD (USAF)

2. - Documentary Photography (J. L. Gaylord)

3. One Phase.

4. To document, photographically, Operation IVY.

5. Both Shots.

6. Motion picture and still film cameras will be located in installations on Gene and Irene.

7. Task Unit 9 desires that one (1) recovery unit consisting of three (3) persons be permitted to re-enter the islands of Gene and Irene on ER + 1 to recover motion picture and still film from remote camera installations. Reason for early collection requirement is to prevent radiation damage to subject film.

8. Task Unit 9 will utilize only one (1) collecting team in the contaminated area. This team will consist of three (3) men and they will require approximately twenty minutes on the island of Gene and approximately thirty minutes on the island of Irene for recovery.

9. One (1) LCM-boat loaded with a specifically designed recovery vehicle will be anchored at Elmer. As early as Rad-Safety will permit, the recovery team will arrive at Elmer from the RENDOVA and depart for Gene to accomplish mission, proceeding to Irene for completion. Upon completion of recovery from above mentioned two (2) islands, LCM-boat and recovery crew will return to Elmer.

[redacted]

[redacted] [redacted]

10. TU-9 has designed and constructed a special purpose vehicle to accomplish recovery at remote installations and affords Radiological Safety in retrieving materials.

11. Protective clothing, dosimeters, and one monitor will be required for the three (3) man recovery team.

12. Three men will be quartered on RENDOVA. Possibilities of high contamination on Gene do exist. Crews to operate L-boat will probably need protective clothing and film badges.

DISTRIBUTION:

25 - LTCOL BRICE (TU-7)
1 - CDR MAYNARD
1 - MAJ SERVIS
1 - CAPT DEMPSEY
1 - CAPT BUSHNELL
1 - Chief of Staff (TG 132.1)
1 - J-3 (TG 132.1)
1 - J-3 (JTF 132)
1 - Rad Safe Officer (TG 132.2)
1 - Rad Safe Officer (TG 132.3)
1 - Rad Safe Officer (TG 132.4)
15 - Rad Safe (TU-7)

THE END

[redacted] [redacted]

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[redacted]

1. Program 2 AEC (NRLK)
2. Project 2.6 Temperature measurement by Neutron Energy Spectrum (TENEX) (E. H. Krause)
3. One phase.
4. A "time of flight" determination of the exploding device's neutron energy spectrum. [redacted]
5. One shot (MIKE)
6. Station 200 at Bogon recording station.
7. Same as project 2.1a.
8. " "
9. " "
10. " "
11. " "
12. " "

[redacted]

[redacted]

1. Program Six DOD(NOL)
2. Project 6.13 Measurement of Free Air Pressures by Rocket Photography (Peter Hanlon)
3. One phase.
4. To make indirect measurement of free air pressures near bomb zero.
5. One shot (KING).
6. This project will utilize high speed photography of a grid in space. The latter being supplied by smoke trails from previously fired rockets. Shock wave passage causes detectable perturbations in the grid; hence film analysis supplies a record of shock position versus time.
7. Reentry when radiological conditions permit. Entry to station 306 on Rojoa.
8. One team will be used. Two men and a monitor.
9. Entry by heliocopter.
10. Not applicable.
11. Services of a monitor, protective clothing, film badges, dosimeters for two men.
12. Monitor should determine film station locations and length of time required for recovery.

[redacted]

[redacted]

1. Program Eleven AEC(AFL)
2. Project 11.5. Marine Survey (L. R. Donaldson)
3. One phase.
4. To determine (a) the present extent of radiation contamination resulting from previous weapons testing programs at Eniwetok, (b) the radiation contamination resulting from IVY. (c) The problems associated with use of the seas as a practical dumping ground for radioactive wastes (d) the biological contamination effects resulting from atomic bursts near water.
5. Pre and post MIKE.
6. Water and marine form samples will be collected on the rim of and within the lagoon.
7. Not applicable.
8. " "
9. " "
10. " "
11. " "
12. Radiation advisory service will be provided to project.

[redacted]