

CLASSIFICATION CANCELLED  
BY AUTHORITY OF DOE/OC  
C. W. Wilson 7/4/85  
DME 4/5/85

CLASSIFICATION CANCELLED  
BY AUTHORITY OF DOE/OC

Carl Wilson 3/9/81

**CONFIDENTIAL**

DOE ARCHIVES

6 US ATOMIC ENERGY

RADIOLOGICAL SURVEY BUREAU FOR NUCLEAR COMMISSION

Collection DBM-EP FILES

410455

Box 2704 Job # 7239

MRTA 7-1 Pacific Pro

Collected in islands fallow fall

INTRODUCTION

Following the first shot of CASTLE... significant fallout occurred over a wide area of the central Pacific. Significant fallout occurred over the inhabited atolls of BIKINI, BONGELAP and UTIRIK. Prior to evacuation the military personnel on BONGELAP and native personnel on BONGELAP received a radiation dose of between 100 and 175 roentgens. The UTIRIK natives who were not evacuated received 37 roentgens. The chart shows the location and radiation dosage received by the personnel of these atolls. Also shown on the chart is the estimated location of the Japanese fishing vessel Fukuryu Maru. This estimated location is approximately 60 miles to the northeast of BIKINI. Some 50 miles to the south of BIKINI is the approximate position of the Task Force Fleet at the time very light fallout was encountered. This fallout was not significant as a health hazard.

Department of Energy  
Historians Office  
ARCHIVES

The BONGELAP natives were evacuated to FRENCH FRIGATE SHOALS and the military personnel were evacuated to FRENCH FRIGATE SHOALS. (ENCLOSED PHOTOGRAPHS OF NATIVES) The two photographs of natives show the external symptoms of radiation sickness. Note the loss of hair and the depigmentation of the skin as evidenced by the photographs. The BONGELAP natives also suffered nausea and vomiting, the characteristic radiation exposure symptoms. The natives were treated at FRENCH FRIGATE SHOALS and are now living at MAJURO Atoll. All the natives have fully recovered, their hair has returned, same color, same count, and the skin has regained its pigmentation. All military personnel were returned to duty within 60 days after exposure. The island of BONGELAP is completely safe and the natives may be returned at any time.

**CONFIDENTIAL**

~~CONFIDENTIAL~~

The incidents associated with the first shot of CASTLE resulted primarily from a paucity of information on fallout from high yield detonations. The MIKE Shot of Operation IVY (on the order of 10 megatons) gave no apparent indication of the magnitude of fallout attending high yield nuclear detonations; the MIKE Shot fission products apparently fell to the Northwest of ENIGMA and were never detected. Reasonably good information on the extent of fallout from large devices was obtained from the several shots of the CASTLE series. We feel that this information will enable us to make fallout forecasts with a high degree of confidence.

Department of Energy  
Historians Office  
ARCHIVES

III. FALLOUT FORECASTING

During the next few minutes I will outline, briefly, the safety measures which will be taken during the forthcoming operation. The Task Force will employ a fallout prediction unit which will make detailed fallout forecasts based on forecast wind field for all shots of the series. You may be familiar with this organization as it is essentially the same group that provided fallout predictions for Operation TRAPDOOR in Nevada. The Fallout Prediction Unit is manned by scientists from the U. S. Weather Bureau, the University of California Radiation Laboratory, Los Alamos Scientific Laboratory, Sandia Corporation and officers of the Air Weather Service. This group is the outstanding authority in this field. The forecasting techniques to be used by this unit were employed successfully for all shots subsequent to the first CASTLE detonation. Previously, fallout forecasting had required long and tedious calculations. For HENNING, the Task Force, through the AEC, has obtained three types of analog computers to aid the unit with their calculations.

~~CONFIDENTIAL~~

One of these, the National Bureau of Standards' fallout computer, presents the fallout pattern on a scope similar to a TV screen. This presentation permits the overlaying of a transparent map of any area on the scope. At the present time there are only two of the NBS computers - the Task Force is using both of them. Engineers from the NBS have installed and are operating these instruments. One of the NBS computers is installed aboard the command ship and the other is in the RADSAFE OFFICE at KENDRICK.

In addition to the fallout forecast, the fallout prediction unit will forecast cloud trajectories which will be used as a basis for diversion of air traffic from areas through which the radioactive cloud may pass. CAA will be informed of the forecast cloud track and will be able to divert air traffic away from any radioactive cloud.

Department of Energy  
Historical Series  
ARCHIVES

III DANGER AREA

After the first shot of CASTLE, it became apparent that the existing danger area did not provide enough space for dumping radioactive debris from nuclear detonations. The danger area was enlarged after the first shot. The danger area indicated on the chart is essentially the same as the enlarged CASTLE area. The enlarged danger area should aid in preventing a recurrence of the Fukushima Maru.

The Task Force will employ one squadron of Lockheed P2V Neptune patrol aircraft to sweep the danger area prior to each shot. We realize that the danger area, some one-half million square miles, is a very large area for thorough aerial reconnaissance. However, search aircraft will sweep the entire danger area until two days prior to a shot. On the second and on the day before a shot, the squadron will make an intensive search in this area

of forecast fallout. Should any shipping be encountered, the ships will be warned that they are in a danger area and requested to clear the area. Should any shipping be encountered on the day just prior to a test, the shot will have to be postponed until the ship is out of danger.

Department of Energy  
Historical Office  
ARCHIVES

#### IV RADIOLOGICAL SURVEYS

The Task Force will conduct an extensive program of locating and measuring fallout. One program will locate and measure the fallout by operating large surface ships through the fallout area. On these specially modified liberty ships, the control rooms have been removed to heavily shielded locations deep within the ship. These ships are essentially floating radiation laboratories. P2V aircraft, equipped with radiation detection and measuring instruments, which telemeter the radiation intensities to a central plot, will be employed to delineate the fallout area from the air. The surface and aerial monitoring of contaminated areas will take place for a duration of six days following each large detonation.

The scientific cloud sampling program will provide early cloud track information which will permit a continuous monitoring of the cloud position during the early dangerous period. All Task Force aircraft will be equipped with radac instruments and are required to report all radiation encountered.

#### V DETECTION AND WARNING NETWORK

The Task Force has established a radac warning and monitoring network at MOYTO, UJELAK, UTRIK, KMAJAKIN, KOENNIK, PAREO, KAPINGMARAUCHI and KUEAIR. These are shown on this chart. These stations are equipped with radiation detection and measuring instruments and manned by qualified radac

**CONFIDENTIAL**

~~CONFIDENTIAL~~

personnel, WAKAI, WAKLANO and WAKIK are manned by U. S. Public Health Service personnel and the remaining stations by military personnel. The class-in-stalls, WAKIK, WAKLANO and WAKIK will be linked with the RAINSAFE SERVICE by a positive frequency radio net. The other locations will be linked through the weather reporting radio net. Auxiliary radiation detection and measuring stations have been set up at the weather stations located at GUMI, MAJURO, RAO JIRA and WAKIK. These stations are equipped with radies instruments and will report any detected radiation through the Pacific weather radio net. All the principal radisafe stations will be able to advise the local population on precautionary measures should unexpected fallout occur.

Department of Energy  
Historical Office  
ARCHIVES

Aircraft will monitor the populated areas of the Northern Marshall Islands after each detonation. The Marshall, Marianas and Hawaiian Islands have been divided into a number of flight plans and will be monitored by patrol and early warning squadrons based in these areas. The Southern Marshall, Marianas and Hawaiian Islands will only be monitored when the predicted trajectory indicates cloud passage over these areas. These areas will not receive any significant fallout. They will be monitored, however, for documentary purposes. Aerial monitoring techniques have been employed very successfully during past tests and we accept this as a fully proven type of radiological monitoring. B-50's will fly a continuous aerial radiation reconnaissance during the first 24 hours after each shot along the line from RUKUNIK to WAKIK Island. This reconnaissance will provide an early warning should the clouds drift toward the populated areas toward the South of this line. P2V aircraft will fly continuous radiological reconnaissance on shot day (1) along an East-West line approximately 50 miles South of RUKUNIK and RUKUNIK, and (2) along a

~~CONFIDENTIAL~~

North-South line 20 miles East of EMBURY for all BUCHE shots. This service will provide early warning for the Task Force and nearby populated areas. The area of reconnaissance is indicated on the air monitoring chart. The radioactive cloud will not present any significant health hazard to air traffic within the established danger area. However, CAI and CIBCPAD will be advised of the forward track of the cloud outside of the danger area.

The Task Force RADSAPF OFFICE will maintain a current radiological situation map at all times. Reports from the various fallout measuring and monitoring programs, and from all island stations will be plotted periodically by the plotting center.

Department of Energy  
Historian's Office  
ARCHIVES

#### VI OFF-SITE RADSAPF

The protection of personnel of the Task Force will not present any difficulty as the Task Force has faced this problem a number of times and has a great depth of experience in this area. Each task group must be self-sufficient in radiological safety. Generally speaking, the functions performed by the Task Force radio units are routine in nature, and are typical of routine radio functions. These units have been augmented with personnel and equipment for EMBURY.

#### VII EMERGENCY PLAN

In the event of a disaster, either natural or induced by JET SEVER operations, the Task Force has the organization and equipment for rescue and care of Task Force and native populations. Within the task force fleet the capability of evacuation has been provided for any of all populated areas that may be affected by fallout. The Task Force emergency medical plan provides

**CONFIDENTIAL**

~~CONFIDENTIAL~~

for the immediate evacuation and care of radiation casualties. All known radiation medicine specialists in the Department of Defense have standby orders to proceed by air to the HONOLULU area in event of a radiation emergency. Special laboratory equipment for the treatment of radiation sickness has been stocked at the various medical centers in the United States and awaits only the signal to be put aboard special flights to the Pacific area.

VIII. CONCLUSIONS

We are confident that the fallout forecasting techniques which I have outlined earlier will insure that all the significant fallout will occur within the danger area. We also believe that we will learn promptly of any significant fallout which might possibly occur outside the danger area. Finally, we believe that we are making adequate arrangements for the protection of Task Force and native populations.

Department of Energy  
Assistant Secretary's Office  
ARCHIVES

~~CONFIDENTIAL~~

**CONFIDENTIAL**

**WEATHER BRIEFING FOR "DUSTY"**

Department of Energy  
Division of Wind  
Engineering

**INTRODUCTION**

Weather has a profound influence upon test operations here at the Pacific Proving Ground. The observing and forecasting of weather in its relation to the testing of high yield weapons is intertwined with the weapons development program in such a way that the two cannot be separated. Of recent times, we have come to realize that weather, and its influence upon radioactive fallout, is the primary factor in determining the proper time to detonate our various weapons and devices.

Of major importance to the task force commander is the forecasting of the wind field, from which a fallout prediction is made. Herein lies the major safety consideration of the task force commander for his personnel, as well as for inhabitants of surrounding areas. As you well know, radiological fallout can be a serious health hazard. Consequently, this fallout must be deposited in areas where it will be harmless. To determine these areas, one must forecast the wind field from the surface to altitudes in excess of 100,000 Feet, since the bomb cloud is acted upon by all winds which affect any portion of the bomb cloud. Realizing that the forecast of the area of radioactive fallout can be no better than the forecast of the wind field, major emphasis has been placed upon providing a proper weather organization for Operation REDWING. Previous experience at the Pacific Proving Ground has taught us that the weather data normally available throughout the Pacific Ocean area is both meager

**CONFIDENTIAL**



~~CONFIDENTIAL~~

and wholly inadequate for accurate weather forecasts of the type required by the task force; consequently, available weather data is not adequate for making reliable fallout forecasts, which are naturally a major concern of the task force commander.

Let us now refer to the various weather factors which affect a test organization such as is assembled here at Eniwetok. While the prediction of the wind field is the most important one, other weather factors cannot be neglected. The extensive air operations which are a necessary part of the test program require timely and accurate forecasts of clouds, temperature, relative humidity, visibility, condensation trails and jet streams, not to exclude those specialized forecasts of certain items for classified operations. Such a routinely sounding matter as a timely and accurate forecast on the "state of the sea" may assume overriding proportions if small craft cannot operate within the confines of the Pacific Proving Ground.

## II ORGANIZATION

To effectively provide the weather service necessary for this test operation, the task force has organized a weather central which, as its name implies, is the central agency for collecting and correlating all weather information, therefrom producing accurate and timely weather forecasts as required by all units of the task force (Chart #1, showing weather organization for REHURGO). The weather central serves the task force commander and his staff through his designated Staff Weather Officer. Personnel assigned to assist me in fulfilling the duties of the staff weather officer include two assistants, plus several enlisted men. No

Department of Energy  
Historian's Office  
ARCHIVES

~~CONFIDENTIAL~~

**CONFIDENTIAL**

take the information given us by the weather central and thereafter brief the commander, and other individuals and units who have placed upon us their special requirements for weather information. The weather central, in turn, is staffed by what we consider to be the finest and best trained group of weather specialists as there is within the uniformed services and the civilian meteorological organizations, a group which is outstanding in its qualifications and capabilities.

Department of Energy  
Historian's Office  
ARCHIVES

Our task force is truly "joint", having members from the Air Force and Naval weather services, as well as from the various civilian meteorological organizations. These men have been trained as a unit to specifically perform the task of properly forecasting tropical weather, the task which the Commander, Joint Task Force SEVEN has placed on them. The 14 forecasters and 25 observers comprising the weather central have been trained by Professor C. I. Palmer of the Institute of Geophysics, UCLA, a world renowned and recognized authority on tropical weather, who is considered by all who know him to be an outstanding scholar and foremost in the field of forecasting tropical weather.

Professor Palmer conducted a course of instruction for these forecasters and observers which was predicated upon requirements of the task force. With this special training, these men are far and above the average weather forecaster in their ability to forecast weather, clouds, and winds in the Pacific Proving Ground area.

### III WEATHER RECONNAISSANCE

To support the weather central, there is a weather reconnaissance unit composed of 19 KC-90 Weather Reconnaissance aircraft. This reconnaissance unit flies a mission of two missions daily of 14 hours duration

**CONFIDENTIAL**

~~CONFIDENTIAL~~

and 2500 miles in length, covering all of the area within a radius of 1200 miles of Eniwetok, and taking observations from the surface to above 30,000 feet. These aircraft continuously gather information on winds, clouds, temperature, relative humidity, and any weather phenomena which may be present, such as rain, thunderstorms, and the like. The unit is particularly effective in gathering needed weather information in that it can send aircraft into any area where one suspects unusual weather conditions; these aircraft can then track and report on this weather. As an added mission, this unit reconnoiters storms and typhoons which originate in the environs of the Pacific Proving Ground so that the task force and the surrounding areas can be properly warned of impending high winds and attendant dangers inherent in tropical Pacific storms and typhoons. The importance of this weather reconnaissance unit's support to the weather central, and in turn to the task force, cannot be over-emphasized, inasmuch as there are extremely large sectors of the Pacific Ocean area which are not observable, weather-wise, by any other means, which point directly to other supporting weather units.

Department of Energy  
Historian's Office  
ARCHIVES

**IV. WEATHER STATIONS**

If one will glance at a chart of the South Pacific area, and note the weather stations normally located in that area (Chart #2, a map of the Pacific with an outline of the U.S. superimposed), one will notice that in an area of the Pacific Ocean the size of the United States, there are only seven stations, while within the United States there are 12 such reporting stations. It is obvious that the task force had to take

~~CONFIDENTIAL~~

measures to improve the weather reporting network. To do this, we have organized a series of weather stations surrounding the immediate areas of Lisianski and Midway. To the east is a surface and upper air reporting station at PUNAHU. To the southeast is a similar station at TAPANA, Co. to the south one at KUSAIE and to the southwest a station at KAPIKAI, HAWAII. These stations are in addition to the U. S. Weather Bureau stations located at TERRY, POLOAPE, MAJURO and KAKE; the normal Air Force weather station at EMBERTON; and the normal weather station at the Naval Air Station HAWAIIAN. Such are our stations surrounding the FPO. In addition, the routine reports of all other weather stations throughout the Pacific Ocean area are collected through an elaborate and comprehensive communications network, by the task force weather central. Still more information is needed and is available; to assist in this regard, all naval ships of the task force collect and report to the weather central; all patrol and search aircraft send routine surface weather observations of the wind, weather, clouds and state of the sea as a normal adjunct of their daily missions. Weather information is received directly in the weather central from as far away as Darwin, Australia, and the Fiji Islands; from the Hawaiian Islands; the Aleutian Islands; Japan; Korea; the Iles; Okinawa; Formosa; the Philippines; (now) the Dutch East Indies; Hong Kong, Singapore and New Guinea. The weather of the Pacific Proving Ground is by no means a self-contained thing, but is influenced by weather conditions many thousands of miles away. All of this information is analyzed by the team of forecasters, who in turn issue pertinent forecasts of the winds, both at the surface and aloft, along with other items normally included in weather forecasts, such as weather per se, the cloud cover and visibility. All of these forecasters have actually but one objective in mind, and

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

that is for the safe conduct of these tests, that is to say the destruction of the weapons and devices without harm to personnel of the task force or to any other persons within the areas surrounding the test area.

**DESTROYERS**

Department of Defense  
Historical Archives

Two destroyers, the USS JAMES E. KILPATRICK and the USS KILPATRICK are attached to the task force for Operation NEPTUNE. Their primary mission will be to intercept any shipping which may be discovered by the NEPTUNE patrol planes. With their high speed they can reach any portion of the area and escort out of danger any strays which may have inadvertently entered the exclusion area. Their speed will also be utilized in any evacuation of the outlying atolls that may be required.

Secondary to their Red Sea duties, the destroyers occupy an important place in the weather observing network. Their fire-control radar is ideal for tracking balloon-borne reflectors and thus determining the winds aloft. These ship soundings should average 20- to 100,000 feet.

In addition to the balloons, the destroyers are equipped with recently developed wind-sounding rockets. These rockets, manufactured by the Loring-Cooper Corporation, are launched from simple aluminum launching tubes mounted on the after 5-inch gun mount.

These rockets explode at pre-set altitudes, ejecting a cloud of metal foil known as "window". As this "window" drifts down it is tracked in the same way that a balloon-borne reflector is tracked on the way up. This rocket wind-sighting system should give wind soundings as high as 150,000 feet. These rockets are known as "Window Aerological Sounding Projectiles" or "WASP". (Chart #1, a schematic sketch of the use of the WASP)

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

The advantage of using destroyers as weather stations is one of mobility. They are not tied down to an atoll but may be used to sample the atmosphere in the blank spaces to the northeast and northwest of the Pacific Proving Ground. They will normally be dispatched to an operating area several days prior to each shot. The choice of the area will depend upon the weather situation prevailing at the time. The data they obtain will be forwarded to the task force weather central for use in their analyses.

Department of Energy  
Historian's Office  
ARCHIVES

VI VERTICAL MOTIONS

When we speak of wind, the wind we mean is normally the horizontal motion, or the wind parallel to surface of the earth. In the great majority of weather problems, this is the only wind we need consider. There is, however, a vertical motion, or component, of the wind towards or away from the earth's surface which is normally neglected in routine operations since its magnitude is usually only 1/10 to 1/100 of the horizontal wind.

The task force organized a Meteorological Research Group at the Air Force Base, Hawaii, to study these vertical motions in the Pacific Proving Ground. (Chart 7, illustrating vertical motions through use of a cross-section) This group was headed by one of the Assistant Staff Weather Officers, Commander D. F. Rex, U. S. Navy.

Briefly, and avoiding technical details, it was determined that there are significant vertical motions in the atmosphere over the Pacific Proving Ground. These motions may reach a velocity of two to three miles an hour either up or down. Easy to us the may be accustomed to thinking

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

of winds of 150 miles per hour in typhoons, these velocities seem to be absolutely insignificant. But remember that these vertical speeds are of the same order of magnitude as the fall velocities of the particles carrying the radioactivity. Thus the effect of the vertical motions would be to dump the radioactivity much closer to the point of detonation in the case of descending air and allow it to be carried farther away in the case of ascending air. In other words, atmospheric vertical motions may substantially increase or decrease the rate of fall of the radioactive particles.

These vertical motions cannot be observed directly or instrumentally as are the horizontal winds. Rather, they must be calculated from the observed horizontal winds at various altitudes. This has never before been done except on a research basis.

Cdr Eck has devised a system whereby these vertical motions will be computed daily on an operational basis. These results, which will be computed by the weather central, will then be used by the Fallout Prediction Unit (FOPU) in its forecasts of the fallout areas.

Department of Energy  
Inspection's Office  
ARCHIVES

#### VII SOLAR HYPOTHESIS

Another task of the previously mentioned Meteorological Research Unit has been to study methods of long range weather prediction in the Pacific Proving Ground. Under the direction of Professor C. K. Palmer, another Assistant Staff Weather Officer, Cdr C. A. Palmer, USN, has been investigating the effect of solar outbreaks, or flares, on the upper level wind structure in the tropics.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

The results have been very encouraging. Briefly, it appears that wind systems which are desirable for shooting have a statistically significant tendency to occur from 3 to 7 days after a solar explosion. We have made arrangements to obtain data on the sun from various parts of the earth on a daily basis. From this we hope to have sufficient advance notice to take advantage of all periods of good shooting weather.

Department of Energy  
Historian's Office  
ARCHIVES

VIII. SPECIAL BALLOONS

With the advent of the high yield devices and weapons, and the attendant increase in the height of rise of the bomb cloud, it has become necessary to have better and more accurate information on winds aloft in the levels above 100,000 feet. (Chart 7, a vertical cross-section of the atmosphere showing winds aloft) Normal sounding devices do not penetrate these extreme altitudes. To alleviate this problem, the task force, in conjunction with the military services and civilian manufacturers, developed several new types of weather balloons which are capable of rising to much greater heights than have been attained before in operational use, in fact, capable of rising to heights even beyond the expectations of those who designed and developed these balloons.

A seeming paradox is found in the tropics. The rising balloon encounters cold temperatures far lower than those found at any place else on the earth, averaging from  $-75^{\circ}\text{C}$  to  $-90^{\circ}\text{C}$ . At these temperatures, the extreme cold causes latex balloons to become brittle and to disintegrate. A balloon has been developed, and is now in use, which survives this extreme cold and thus allows the balloon to continue its ascent into the lower stratosphere.

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~

These balloons carry aloft a small transmitter, a radiophone, which is followed by a radio direction finding system; the equipment is known as Q-11. As the balloon carries its transmitter aloft, it is tracked by the RLV technique and the wind direction and speed is automatically computed. The transmitter also sends back to a ground receiver a continuous record of the pressure, temperature, and relative humidity encountered as the instrument rises. Thus, an aerological sounding is made of the atmosphere in the vertical. This equipment is not new, nor unique, but is possibly used more extensively here in this area of the Pacific than anywhere else.

Department of Energy  
Historian's Office  
ARCHIVES

### II. SPECIAL FACSIMILE NETWORK

To better utilize all weather information available throughout the Pacific and to transmit completed analyses and forecasts prepared by the task force weather central, special facsimile networks have been established. All of you gentlemen are well aware of the part that facsimile plays in your work. In the same helpful manner the task force makes use of this very viable media. The weather central regularly copies charts of the surface and upper air analyses which are broadcast by the major forecasting centers in Tokyo and Eniwai. These analyses are used to supplement and confirm the analyses made by our weather central. In turn, analyses and forecasts prepared by the task force weather central are transmitted to using agencies of the task force by facsimile. This is a rather new and unique method of providing weather information to subordinate users. These forecasts are then used routinely in the planning of test operations by these subordinate units. (Chart #4, showing the facsimile net)

~~CONFIDENTIAL~~

Department of Energy  
Historian's Office  
ARCHIVES

**CONFIDENTIAL**

Department of Energy  
Historical Office  
ARCHIVES

Undoubtedly it is of interest to all of you to know just how a competent weather central proceeds in performing its duties and arriving at a weather forecast which can be of use to the commander and his staff in making the proper decision when to detonate a weapon or device without causing a safety hazard by allowing radioactive debris to fall on populated areas. These forecasts begin with the collection of weather information, amounting normally to a count of 75,000 groups per day. This is the same as saying that 75,000 words daily are furnished into the analyzing unit, the weather central. All of this information is then completely inspected, placed into its proper perspective, and then analyzed. From this analysis a prognosis or forecast is made of future weather events, particularly the wind field aloft. By continuously analyzing what has happened in the past, and what is happening at the present, trends may be established and forecasts made. This procedure is not different from that employed in any normal forecasting activity, but never has so much emphasis been placed on forecasting tropical weather. Tropical weather is little understood and has been poorly documented in the past, in spite of numerous campaigns over extensive areas of the Pacific during World War II. Climatological records have not before been maintained adequately to allow a tropical forecaster to understand what has taken place in his area of interest. Our increased number of stations during periods of weapons test activity allow us to gain this much needed knowledge. From such historical information, an experienced forecaster is then able to make daily analyses and therefore make an accurate forecast of the various weather elements. Now, this term "accurate" needs to be defined. At best, weather, and the forecasting thereof, can never under any circumstances be called an exact science, such as physics, or chemistry, or mathematics. Meteorology is a field

~~CONFIDENTIAL~~

science which encompasses an area extending horizontally over the entire earth's surface, and reaching in the vertical to the extreme reaches of space. Since so little is known of so much of the great expanse of atmosphere that surrounds the earth, it is not hard to understand why at this early time in mankind's exploration of the outer spaces, so little is known about weather, its production, and its possible control. So, never at any time do we believe that weather is an exact science and that weather can always be exactly forecast. We in the task force feel that we have the most capable group of individuals available gathered here to forecast the required weather information needed by the task force commander, but we are human and fallible. With the voluminous amount of data and breadth of experience of our group, we feel that a most consistent and exemplary job can be accomplished, that of forecasting the weather for the Pacific Proving Ground.

The desired forecast is arrived at only when mature judgment has considered what can reasonably be expected to occur within the following 24 to 48 hours. No reliable means has been developed to forecast weather beyond this exact period of time except the Solar Hypothesis, which has been discussed previously. The forecast of the weather and upper wind field is then used by all interested in arriving at a proper conclusion when they can safely conduct their test operations. The task force commander then makes the final decision on firing, only after fully considering all safety aspects. It is of interest to realize that in excess of 500 men are required to support the task force in its weather activities. This is the number under the direct command and control of the task force commander, and does not include those men who gather and transmit weather

~~CONFIDENTIAL~~

**CONFIDENTIAL**

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

... (illegible) ...

**CONFIDENTIAL**

GENERAL STATEMENT OF THE ATOMIC ENERGY COMMISSION

In all atomic test series, the interest of the Federal Defense Administration in operation is to provide the

The first and primary interest is to obtain information on blast, heat and radiation effects of various sized weapons under varying conditions of its effects, through the

The information obtained in this and other tests is essential in the development and application of atomic energy to protect the greatest number of people in the event of the

magnitude of civil defense emergency, the nature of the physical effects, the nature of the radiation, and the nature of the

and aside from the technical considerations, the results of a series of tests can be of tremendous value in educating the American citizens the true dimensions of the threat presently

confronting our Nation and the world; in eliminating confusion concerning the magnitude and limitations of the threat; and in pointing up the vital need for the development of the strongest possible civil defense as one of the major lines in our total

national security.

The observers invited to participate in Operation Hardtop were chosen on the basis of those who could most benefit from the lessons to be learned from the test series - and those who could best transmit the knowledge gained to the people of America.

The briefings, the tours of inspection, and the witnessing of the various tests will, I am sure, lead to a better understanding of the effects of nuclear weapons and the enormous task for which civil defense must be met.

In our opinion, this, too, will be a major accomplishment - and one which will contribute greatly to the ultimate assurance of a lasting peace through the unflinching of our people in the face of national defense.

Technically, the AEC hopes especially to obtain from this Pacific Series further pertinent data relative to radioactive fallout to assist in the development of radiological defenses.

Prompt determination of the intensity and extent of fallout is basic to most civil defense emergency operations. For this reason, we are particularly interested in the tests of fallout

measurement techniques, including early aerial survey measure-  
ments using aircraft with a gamma detection system.

Of equal interest will be tests of methods to measure gamma  
dose rates, both after detonation and after fallout, due to  
the significance of these rates in determining when rescue oper-  
ations, fire fighting and other civil defense actions may be  
conducted.

Additionally, the studies in this series of particle character-  
istics of fallout material are expected to provide basic data  
for fallout prediction models.

AFSA is deeply concerned with the effectiveness of different  
methods for decontamination of surfaces of buildings, clothing,  
and other materials which have been exposed to residual radio-  
active fallout. Consequently, the results of such tests

during testing will be reviewed with much interest.

In the area of blast effects, much valuable data was obtained  
in Nevada tests concerning structural response to short-duration  
overpressure loading. The larger weapon detonations in the  
Pacific should furnish helpful additional information on the  
effects of long-duration overpressure on structures. Such data

is of great value to civil defense in the establishment of standards of protective construction.

Likewise, the amount of thermal energy measured at various distances from the point of detonation of large-yield weapons will be particularly helpful to civil defense in planning for human protection and in estimating the extent of potential fire hazard in target cities.

Department of Energy  
Historian's Office  
ARCHIVES