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Item 1

150. REPORT NUMBER WT--1302  
110. PRIMARY TITLE (M) Burst measurements on a medium-yield surface  
burst. Project 1.2 [of] Operation Redwing. Final report  
72. PERSONAL AUTHOR/AFFIL Broyles, C.D.  
710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (United States)  
371. PUB. DATE (YYMMDD) 600125  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Overpressure and dynamic pressure were measured as  
a function of time and distance (690--3,250 feet) on a  
surface burst (Lacrosse) of a medium yield.  
Overpressures were measured with ground baffles and  
pitot-static gages. A precursor formed but died out at  
an unusually high overpressure of between 35 and 55 psi.  
The usual high dynamic pressures associated with  
precursors were observed. Outside of the limited region  
in which the precursor existed, the overpressure and  
dynamic pressure measurements were in agreement with  
previous measurements on surface bursts. They were  
consistent with the free-air values for 1.6 times the  
actual yield of 39.5 kt.  
801. KEYWORD (S) LACROSSE BURST;BLAST MEASUREMENTS;PEAK PRESSURE  
STUDIES;TIME DEPENDENCE;PRESSURE-DISTANCE STUDIES;  
PRESSURE MEASUREMENT

Item 2

150. REPORT NUMBER WT--649  
110. PRIMARY TITLE (M) Fallout gamma ray intensity. Project 5.3 [of]  
Operation Ivy  
72. PERSONAL AUTHOR/AFFIL Klein, M.P.  
710. CORPORATE SOURCE California Univ., Livermore, CA (United States).  
Lawrence Radiation Lab.  
371. PUB. DATE (YYMMDD) 580100  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Measurements of the intensity of fallout gamma  
radiation as a function of time and distance from the  
Ivy Mike and King shots are reported. Instruments were  
placed around Eniwetok Atoll and at several atolls in a  
southerly semicircle with respect to Eniwetok. Contrary  
to expectations the winds prevailing at the time of the  
Mike shot were south or southeasterly and no fallout  
gamma radiation with the limits of detectability was  
measured at any location other than Eniwetok. The gamma  
radiation measured on Eniwetok Atoll was considered  
normal fission fragment radiation which decayed with a

5003375

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t{sup {minus}1.2} characteristic.

801. KEYWORD(S) IVY;MIKE BURST;KING BURST;FALLOUT;GAMMA DETECTION;  
RADIATION MONITORING;DISTANCE;TIME DEPENDENCE

Item 3

150. REPORT NUMBER WT--18-Pt.VI

110. PRIMARY TITLE(M) Mortality rate as a function of dose. Pt. VI of  
control studies performed in the United States and at  
Eniwetok. Annex 2.2 (Part VI) [of] Scientific Director's  
report of atomic weapon tests at Eniwetok. Operation  
Greenhouse

72. PERSONAL AUTHOR/AFFIL Bond, V.P.

710. CORPORATE SOURCE Naval Medical Research Inst., Bethesda, MD (United  
States); Naval Radiological Defense Lab., San Francisco,  
CA (United States)

371. PUB. DATE(YMMDD) 510000

34. CLASSIF. LEVEL TEXT Official Use Only

950. ABSTRACT LAf{sub 1} mice, swine, and dogs were exposed to x  
radiation to determine the mortality rate-dose  
relationship. The data on mice were analyzed by the  
method of probits, and the values for the LD{sub 50}'s  
and y intercepts of the regression lines were  
determined. LD curves for swine indicate that bilateral  
irradiation is more lethal than unilateral, and dose  
distribution is dependent on wave length. LD{sub 50/30},  
and gross and microscopic pathologic changes produced in  
dogs were determined. It was concluded that the  
confinement of dogs, swine, and mice under conditions  
similar to those encountered at Greenhouse did not  
affect significantly their response to irradiation.

801. KEYWORD(S) MICE;SWINE;DOGS;MORTALITY;X RADIATION;LETHAL  
IRRADIATION;DOSE-RESPONSE RELATIONSHIPS;GREENHOUSE

Item 4

150. REPORT NUMBER XRD--191

110. PRIMARY TITLE(M) Historical report [of] atomic bomb tests Able and  
Baker conducted at Bikini Atoll, Marshall Islands on  
July 1, 1946 and July 25, 1946. Vol. 3 of 3 Vol.  
Operation Crossroads

710. CORPORATE SOURCE Joint Task Force One, Washington, DC (United  
States)

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT This volume of Operation Croassroads' History  
consists of a series of documentary photographs covering  
the various phases of the operation.

801. KEYWORD(S) ABLE BURST;BAKER BURST;CROSSROADS;IMAGES;  
PHOTOGRAPHY;HISTORICAL ASPECTS

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Item 5

150. REPORT NUMBER XRD--189  
110. PRIMARY TITLE (M) Historical report [of] atomic bomb tests Able and Baker conducted at Bikini Atoll, Marshall Islands on July 1, 1946 and July 25, 1946. Vol. 1 of 3 Vol. Operation Crossroads  
710. CORPORATE SOURCE Joint Task Force One, Washington, DC (United States)  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The history of Operation Crossroads is presented in this report. The history provides a chronological account of the effort, extending over a period of eight months, which the groups under the Director of Ship Material and other closely related groups put forth to obtain the results that lie behind the technical reports.  
801. KEYWORD (S) CROSSROADS;ABLE BURST;BAKER BURST;HISTORICAL ASPECTS

Item 6

150. REPORT NUMBER LAMS--2020  
110. PRIMARY TITLE (M) The wind variability of fallout patterns  
72. PERSONAL AUTHOR/AFFIL Sherman, L.  
710. CORPORATE SOURCE Los Alamos Scientific Lab., NM (United States)  
371. PUB. DATE (YYMMDD) 560300  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT On the basis of winds from four Pacific shot days, that part of the variability of the computed fallout intensity patterns due to the variability of the winds is investigated. An extreme case from Operation Sandstone is considered and tentative operational conclusions are drawn.  
801. KEYWORD (S) WIND;FALLOUT;ATOMIC CLOUD TRAVEL;BOMB DEBRIS MOTION;SANDSTONE;PACIFIC PROVING GROUNDS

Item 7

150. REPORT NUMBER CTE--000038  
110. PRIMARY TITLE (M) A historical review of the development of the LASL stemming procedure 1958-1976  
170. AN. AUTHOR AFFILIATION Los Alamos Scientific Lab., NM (USA)  
710. CORPORATE SOURCE Los Alamos Scientific Lab., NM (USA)  
371. PUB. DATE (YYMMDD) 760300  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This report presents information concerning Hardtack Operation-1958, containment experiments, Nevada Test Site tests-1961 to 1970, downhole cable gas blocks,

5003377

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coal tar epoxy gas seal plugs, and post-BANE BERRY operations.

801. KEYWORD(S) CONTAINMENT/HARDTACK; HARDTACK-PHASE II; LANL; NEVADA TEST SITE

Item 8

150. REPORT NUMBER UCRL-ID--104916  
110. PRIMARY TITLE(M) Estimates of the radiological dose to people living on Bikini Island for two weeks while diving in and around the sunken ships in Bikini Lagoon  
72. PERSONAL AUTHOR/AFFIL Robison, W.L.  
710. CORPORATE SOURCE Lawrence Livermore National Lab., CA (United States)  
750. PUBL. ANNOUNCEMENT EDB-92:082046; NTS-92:017705; INS-92:014913; ERA-17:019563  
371. PUB. DATE (YYMMDD) 900900  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Bikini Island and Bikini Lagoon were contaminated by fallout from nuclear weapons tests conducted at the atoll by the United States from 1946 to 1958. The second test, Baker, of the Crossroads series was an underwater detonation in 1946 that sank several ships in the lagoon, including the USS Saratoga and the Japanese battleship Nagato. The ships received high-intensity gamma-ray and neutron bombardment from the Baker test, which induced radioactivity in the metal structures. Some of the tests conducted after the Baker shot (there were 21 tests in all) injected contaminated carbonate particles into the air, some of which were deposited across the lagoon surface. Most of this contaminated soil then settled onto the ships' decks and other structures and on the lagoon bottom. These sunken ships provide an interesting location for divers. Recreational diving and swimming in and around the ships raises the question of the potential radiological dose from the radionuclides present in or on the ships and in the lagoon sediments. The purpose of this paper, therefore, is to present an analysis of the potential radiological dose to persons who would dive near the sunken ships and live on Bikini Island for a short period of time.

801. KEYWORD(S) BIKINI/FALLOUT; SHIPS/underwater ; SHIPS/radiation hazards ; FALLOUT/sampling ; BIKINI; SHIPS; UNDERWATER; RADIATION DOSES; COBALT 60; CESIUM 137; AMERICIUM 241; BISMUTH 207; EUROPIUM 155; SEDIMENTS; ATOMIC EXPLOSIONS; SAMPLING;

Item 9

150. REPORT NUMBER PB--92-106244/XAB

5003378

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110. PRIMARY TITLE(M) Sediment facies of Enewetak Atoll lagoon. Geologic and geophysical investigations of Enewetak Atoll, Republic of the Marshall Islands. Professional paper

72. PERSONAL AUTHOR/AFFIL Wardlaw, B.R.; Henry, T.W.; Martin, W.E.

710. CORPORATE SOURCE Geological Survey, Alexandria, VA (United States)

750. PUBL. ANNOUNCEMENT GRA-92:02538;EDB-92:023703

371. PUB. DATE (YYMMDD) 910000

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT Two sets of benthic (bottom-surface) samples were taken from the lagoon on Enewetak Atoll, Republic of the Marshall Islands, during the PEACE Program (1984-1985). These samples were collected to (1) familiarize project geologists with the distribution of sediment types and facies within Enewetak lagoon, (2) increase understanding of the distribution of modern microfaunas in the lagoon, and (3) supplement studies of the sea-floor features both within and near OAK and KOA craters. The benthic sample studies aided both evaluation of the stratigraphic sequence penetrated during the Drilling Phase and interpretation of the litho- and biostratigraphic framework used in analysis of OAK and KOA.

801. KEYWORD(S) ENIWETOK/paleontology; SEDIMENTS; BENTHOS; STRATIGRAPHY; GEOLOGIC SURVEYS; GEOPHYSICS; SEDIMENTATION; TESTING; MARSHALL ISLANDS; SEA BED; DATA TABULATIONS; CRATERS; ATOMIC EXPLOSIONS; GROUND WATER; ENIWETOK; PALEONTOLOGY

Item 10

150. REPORT NUMBER PB--92-100825/XAB

110. PRIMARY TITLE(M) Larger foraminifer biostratigraphy of PEACE boreholes, Enewetak Atoll, Western Pacific Ocean. Geologic and geophysical investigations of Enewetak Atoll, Republic of the Marshall Islands. Professional paper

72. PERSONAL AUTHOR/AFFIL Gibson, T.G.; Margerum, R.

710. CORPORATE SOURCE Geological Survey, Alexandria, VA (United States)

750. PUBL. ANNOUNCEMENT GRA-91:91743;EDB-92:012506

371. PUB. DATE (YYMMDD) 910000

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT Larger foraminiferal assemblages, including *Lepidocyclus orientalis*, *Miogypsina thecideaformis*, *Miogypsinoidea dehaartii*, etc., and a smaller foraminifer, *Austrotrillina striata*, are used to correlate upper Oligocene and lower Miocene strata in the Pacific Atoll Exploration Program (PEACE) boreholes at Enewetak Atoll, Republic of the Marshall Islands, western Pacific Ocean, with the Te and Tf zones of the previously established Tertiary Far East Letter

5003379

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Zonation. Correlation using these two benthic groups is critical because calcareous nannofossils and planktic foraminifers are absent in the lower Miocene strata. Biostratigraphic data from these boreholes delineate a thick (greater than 700 feet) sequence of upper Oligocene and lower Miocene strata corresponding to lower and upper Te zone. These strata document a major period of carbonate accumulation at Enewetak during the Late Oligocene and early Miocene (26 to 18 million years ago).

## 801. KEYWORD(S)

ENIWETOK/geologic formations ;GEOLOGIC FORMATIONS/paleontology ;STRATIGRAPHY;PROTOZOA;BOREHOLES; MARSHALL ISLANDS;THICKNESS;CARBONATES;ENIWETOK;TERTIARY PERIOD;CORRELATIONS;EXPLORATION;AGE ESTIMATION; PALEONTOLOGY;ATOMIC EXPLOSIONS

## Item 11

150. REPORT NUMBER PB--91-239061/XAB

110. PRIMARY TITLE(M) Calcareous nannofossils and planktic foraminifers from Enewetak Atoll, Western Pacific Ocean: Geologic and geophysical investigations of Enewetak Atoll, Republic of the Marshall Islands. Professional paper

72. PERSONAL AUTHOR/AFFIL Bybell, L.M.; Poore, R.Z.

710. CORPORATE SOURCE Geological Survey, Alexandria, VA (United States)

750. PUBL.ANNOUNCEMENT GRA-91:11922;EDB-92:006530

371. PUB. DATE(YMMDD) 910000

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT Boring of the carbonate sequence at the northern end of Enewetak Atoll, Republic of the Marshall Islands, was conducted in 1985, as part of the Pacific Enewetak Atoll Crater Exploration (PEACE) Program. The overall goal of the program was to characterize physical effects of large-scale nuclear blasts, which were conducted in the early 1950's, on the sediments of the atoll. In the report the authors document the occurrences of stratigraphically diagnostic planktic microfossils in samples from Enewetak (generally referred to as core) and outline the rationale for incorporating all available diagnostic planktic assemblages into a composite sequence that was used to date the Enewetak benthic zonation.

## 801. KEYWORD(S)

ENIWETOK/geologic surveys ;ATOMIC EXPLOSIONS/BLAST DAMAGE;GEOPHYSICAL SURVEYS;SEDIMENTS;PACIFIC OCEAN; STRATIGRAPHY;CARBONATE ROCKS;MARSHALL ISLANDS;PROTOZOA; ENIWETOK

## Item 12

150. REPORT NUMBER NBS--6050

5003380

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110. PRIMARY TITLE(M) Ionospheric effects due to nuclear explosions.  
Project No. 8520-12-8510  
72. PERSONAL AUTHOR/AFFIL Utlaut, W.F.  
710. CORPORATE SOURCE National Bureau of Standards, Boulder, CO (United States)  
371. PUB. DATE(YMMDD) 590430  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT Extreme disturbances of the ionosphere were noted over the Pacific Ocean. These disturbances which were related to the high-altitude nuclear blasts over Johnston Island on August 1 and 12, 1958 were manifested by complete fadeouts on many radio circuits, abnormal magnetic perturbations, and a rare tropical aurora. It appears that prompt radiation from both nuclear tests caused increased ionization and absorption in the D region for a short interval of time. The higher altitude test caused an almost immediate increase in electron density in the F region, followed by a marked reduction in electron density, sufficient to prevent reflections of signals above 1 Mc, which was possibly attributable to increased recombination rate caused by influx of bomb residue. A similar reaction occurred after the lower level explosion, with a 45-min delay, but not to such an extent as to cause blackout. Graphical representations are given for f-plots of the ionospheric data taken at Maui, Hawaii, on both test dates.  
801. KEYWORD(S) IONOSPHERIC BURSTS;HIGH ALTITUDE;IONOSPHERIC EFFECTS;DISTURBANCES;ORANGE BURST;TEAK BURST;ATMOSPHERIC BURSTS;RADIO INTERFERENCE; ELECTRON DENSITY;BLACKOUT; F REGION;D REGION

Item 13

150. REPORT NUMBER NP--9298  
110. PRIMARY TITLE(M) The results of a physical and biological oceanographic survey at Eniwetok, September--October 1957  
710. CORPORATE SOURCE Fish and Wildlife Service, Honolulu, HI (United States)  
371. PUB. DATE(YMMDD) 580115  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT Results of an oceanographic survey in the vicinity of Eniwetok Atoll, Marshall Islands, are presented. The observations included bathythermographs; meteorology; vertical distribution of temperature, salinity, density, and dissolved oxygen; sea and swell; zooplankton sampling; night-light fishing; tuna school and bird flock sightings; and surface trolling and angling.  
801. KEYWORD(S) ENIWETOK;ENIWETOK PROVING GROUND;OCEANOGRAPHY; METEOROLOGY;TEMPERATURE DISTRIBUTION;PLANKTON;FISHES;

5003381

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BIRDS;SITE SURVEYS

Item 14

150. REPORT NUMBER AD--460765  
110. PRIMARY TITLE(M) VLF propagation near high altitude atomic  
explosions. Technical Memo 45-14  
710. CORPORATE SOURCE Naval Ordnance Lab., Corona, CA (USA)  
371. PUB. DATE (YYMMDD) 590220  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Some observations on the effects of the Orange and  
Teak events of Operation Hardtack upon vlf noise  
propagation are summarized.  
801. KEYWORD(S) ORANGE BURST;TEAK BURST;RADIO INTERFERENCE;NOISE;  
EFFECTS EXPERIMENTS

Item 15

150. REPORT NUMBER UCRL--12273  
110. PRIMARY TITLE(M) Estimate of radiation dose to thyroids of the  
Rongelap children following the Bravo event  
72. PERSONAL AUTHOR/AFFIL James, R.A.  
710. CORPORATE SOURCE California Univ., Livermore, CA (USA). Lawrence  
Radiation Lab.  
371. PUB. DATE (YYMMDD) 641216  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT An estimate is made of the radiation dose to the  
thyroids of Rongelap children following the Bravo event  
of March 1, 1954. The available experimental data are  
used to estimate the dose under two alternate  
assumptions of mode of intake: all by inhalation; and  
all by oral ingestion. It is concluded that the most  
probable dose to the thyroid of a 3- to 4-year-old girl  
is in the range 700--1400 rad.  
801. KEYWORD(S) BRAVO BURST;RONGELAP;RADIATION DOSES;CHILDREN;  
THYROID GLAND;INHALATION;INGESTION

Item 16

90. PRIMARY TITLE(A) Handling of radioactive fallout problems at  
Chernobyl accident (1986) as compared with that of  
Bikini accident (1954)  
110. PRIMARY TITLE(M) Radiation protection practice. IRPA 7  
60. PERSONAL AUTHOR(A) Nishiwaki, Y.;Kawai, H.;Morishima, H.;Koga, T.;  
Niwa, T.;Sugimura, Y.  
170. AN. AUTHOR AFFILIATION Kinki Univ., Higashi-Osaka, Osaka (Japan). Atomic  
Energy Research Inst.; Meteorological Research Institute,  
Tsukuba (Japan)  
710. CORPORATE SOURCE International Radiation Protection Association,  
Washington, DC (USA) ; Australian Radiation Protection

5003382

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Society, Sydney (Australia)

750. PUBL.ANNOUNCEMENT AIX-20:045053;EDB-89:086438  
371. PUB. DATE(YMMDD) 880000  
34. CLASSIF. LEVEL TEXT unclassified  
950. ABSTRACT

We conducted an analysis in Japan of the highly radioactive fall-out on the Japanese fishing boat No. 5 Fukuryu Maru that was engaged in fishing about 150 km east of Bikini at the time of the thermonuclear test conducted early in the morning of 1 March 1954, and which returned to Japan in the middle of the same month.

801. KEYWORD(S) CHERNOBYLSK-4 REACTOR/contamination ;  
FALLOUT/global aspects/japan ;FISSION PRODUCT RELEASE/;  
PERSONNEL/radiation accidents ;REACTOR  
ACCIDENTS/contamination ;AIR;BETA DETECTION;BETA SPECTRA;  
BIKINI;CALCITE;CESIUM 137;CONTAMINATION;COMPARATIVE  
EVALUATIONS;DUSTS;JAPAN;GAMMA RADIATION;FALLOUT;IODINE  
131;IRRADIATION;ISOTOPE RATIO;KRYPTON 85;FALLOUT;  
PARTICLE SIZE;PERSONNEL;RADIATION DOSES;RADIATION  
SYNDROME;RADIOACTIVITY;RARE GASES;SEAFOOD;SOCIO-ECONOMIC  
FACTORS;SOURCE TERMS;ATOMIC EXPLOSIONS;URANIUM 237

Item 17

150. REPORT NUMBER DOE/NBM--5002794  
110. PRIMARY TITLE(M) Operation HARDTACK II: surface motions from  
underground explosions  
70. PERSONAL AUTHOR(M) Carder, D.S.; Murphy, L.M.; Pearce, T.H.; Mickey,  
W.V.  
710. CORPORATE SOURCE Coast and Geodetic Survey, Washington, DC (USA)  
750. PUBL.ANNOUNCEMENT EDB-85:014932  
371. PUB. DATE(YMMDD) 600401  
950. ABSTRACT Ground effects resulting from certain HARDTACK II  
underground explosions were measured by strong-motion  
and teleseismic seismographs from 2000 ft to distances  
of nearly 100 miles. In addition, many temporary  
seismographs were operated by a number of organizations  
to distances of nearly 2400 miles, and routine  
seismographs continued to operate on a worldwide basis.  
Some of the results are given in this report. For safety  
purposes, predictions of ground effects, using formulas  
derived by the Coast and Geodetic Survey from  
pre-Rainier H. E. tests and modified slightly as a  
result of the Rainier tests, hold with reasonable  
accuracy. However, it is believed that low frequency  
ground displacements in the distance ranges covered in  
this report attenuate, with absorption, as the first  
power of the distance. An energetic wave believed  
reflected from the surface near the source was recorded  
by some of the strong-motion seismographs. It is out of  
phase with the initial wave and follows it by about a

5003383

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quarter second. From the ground effects standpoint, the Blanca shot was equivalent to a magnitude 4.8 earthquake.

801. KEYWORD(S) UNDERGROUND BURSTS/SEISMIC GROUND WAVES;  
HARDTACK/SEISMIC GROUND WAVES;ATOMIC EXPLOSIONS

Item 18

150. REPORT NUMBER AD-A--183000/9/XAB  
110. PRIMARY TITLE(M) Strategic Defense Initiative  
Demonstration/Validation program environmental  
assessments summary  
70. PERSONAL AUTHOR(M) Brown, G.  
710. CORPORATE SOURCE Strategic Defense Initiative Organization,  
Washington, DC (USA). Systems Engineering  
750. PUBL. ANNOUNCEMENT GRA-87:60120;EDB-87:170169  
371. PUB. DATE(YMMDD) 870800  
34. CLASSIF. LEVEL TEXT unclassified  
950. ABSTRACT The Strategic Defense Initiative Organization  
(SDIO) and its proponents (the U.S. Army and U.S. Air  
Force) plan to conduct Demonstration/Validation tests of  
the six technologies to demonstrate their respective  
ability to perform their required tasks, and to validate  
the requirements to determine their feasibility for a  
future decision on whether to proceed with Full-Scale  
Development. Demonstration/Validation tests would be  
conducted at 14 government facilities across the United  
States and the Republic of the Marshall Islands, and at  
contractor facilities. Tests would include analyses,  
simulations, component/assembly tests, and flight tests.  
This document summarizes the findings expressed in the  
six Environmental Assessments for  
Demonstration/Validation testing of the individual  
technologies, and analyzes the potential cumulative  
environmental consequences of testing of multiple  
technologies at a given facility. In the event that any  
other technology is ready for entry into  
Demonstration/Validation at a later date, an  
Environmental Assessment will be prepared for that  
technology and this summary will be updated.

801. KEYWORD(S) TEST FACILITIES/ENVIRONMENTAL STUDIES;MILITARY  
FACILITIES/test facilities ;BALLISTIC MISSILE  
DEFENSE/test facilities ;CONTRACTS;FLIGHT TESTING;  
MARSHALL ISLANDS;TESTING;SIMULATION;COLORADO;COLORADO;  
FLORIDA;CALIFORNIA;MARYLAND;VIRGINIA;NEVADA;NEW YORK;  
TENNESSEE;MASSACHUSETTS

Item 19

150. REPORT NUMBER AD--611246/0/XAB

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110. PRIMARY TITLE(M) Test results from automatic yield indicators  
 70. PERSONAL AUTHOR(M) Cowan, M.; Munro, D.N.; Sander, H.H. ;  
 710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (USA)  
 750. PUBL.ANNOUNCEMENT ERA-12:005062;EDB-87:005160  
 371. PUB. DATE(YMMDD) 601000  
 34. CLASSIF. LEVEL TEXT unclassified  
 950. ABSTRACT Automatic yield indicators which operate on the negative-phase duration principle were developed. Yield estimates were obtained during Hardtack Phase I for five detonations at distances ranging from 11 to 25 miles. The greatest error in yield was obtained at 22.5 miles where the ratio of indicated yield to actual yield was about 2.5. For a lapse condition, it is estimated that automatic yield indicators will nearly always indicate within a factor of 2 or 3 of the actual yield within the range to 0.1 psi peak overpressure (about 30 miles for 1 mt). Under strong low-level temperature inversions (rapid increase in temperature with increase in height above the surface) at Nevada Test Site, automatic yield indicators functioned properly on 11 shots on Operation Hardtack, Phase II. Yields ranged from 0.62 ton to 6.5 kt and distances ranged from 2 to 13 miles. On eight of these events, indicated yields were within a factor of 2 of actual yields. Greater errors on the three other events were caused by interference effects resulting from the inversion conditions. This and other blast-wave measurements indicate that factor-of-2 yield estimates can be obtained by the AYI about 70% of the time under strong inversion conditions within the range of 0.1 psi.

801. KEYWORD(S) HARDTACK/;ATOMIC EXPLOSIONS/YIELD;SHOCK WAVES; ERRORS;EQUIPMENT;YIELD;AUTOMATION;ERRORS

## Item 20

150. REPORT NUMBER AD--363644/6/XAB  
 110. PRIMARY TITLE(M) Detection of fireball light at distances  
 70. PERSONAL AUTHOR(M) Oleson, M.H.  
 710. CORPORATE SOURCE Air Force Technical Applications Center, Patrick AFB, FL (USA)  
 750. PUBL.ANNOUNCEMENT ERA-11:051890;EDB-86:159957  
 371. PUB. DATE(YMMDD) 580829  
 34. CLASSIF. LEVEL TEXT unclassified  
 950. ABSTRACT Attempts were made to detect at long distances the light emitted from the Ivy detonations. Two locations, Johnston Island (3,100 km) and Kwajalein Island (620 km), were chosen. At Kwajalein, in addition to a ground installation, equipment was also mounted in a plane flying above the cloud cover. Measurements were made with red- and blue-sensitive photocells. Out of a possible total of six records, only one positive

5003385

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detection was made and this was from the equipment in the plane on the occasion of King shot. The remaining cases are accounted for as follows: Three cases were timing-notification uncertainties which make it impossible to state that the equipment was operating at detonation time; one case where it is known that the equipment was operating at the right time, but there is no record of the light signal. It is concluded that light from a nuclear detonation can be detected to a distance of about 600 km under favorable conditions. Any further work should emphasize a basic study of the phenomena involved in the transmission of light beyond the horizon.

801. KEYWORD(S) IVY;/ATOMIC EXPLOSIONS/VISIBLE RADIATION ;  
DETECTION;ATTENUATION;ABSORPTION

Item 21

150. REPORT NUMBER UCRL--53840  
110. PRIMARY TITLE(M) Radiological conditions at Bikini Atoll:  
Radionuclide concentrations in vegetation, soil, animals,  
cistern water, and ground water  
70. PERSONAL AUTHOR(M) Robison, W.L.; Conrado, C.L.; Stuart, M.L.  
710. CORPORATE SOURCE Lawrence Livermore National Lab., CA (USA)  
750. PUBL. ANNOUNCEMENT ERA-14:017157;EDB-89:038765;NTS-89:012887  
371. PUB. DATE(YMMDD) 880531  
34. CLASSIF. LEVEL TEXT unclassified  
950. ABSTRACT This report is intended as a resource document for  
the eventual cleanup of Bikini Atoll and contains a  
summary of the data for the concentrations of {sup  
137}Cs, {sup 90}Sr, {sup 239+240}Pu, and {sup 241}Am in  
vegetation through 1987 and in soil through 1985 for 14  
islands at Bikini Atoll. The data for the main residence  
island, Bikini, and the most important island, Eneu, are  
extensive; these islands have been the subject of a  
continuing research and monitoring program since 1974.  
Data for radionuclide concentrations in ground water,  
cistern water, fish and other marine species, and pigs  
from Bikini and Eneu Islands are presented. Also  
included are general summaries of our resuspension and  
rainfall data from Bikini and Eneu Islands. The data for  
the other 12 islands are much more limited because  
samples were collected as part of a screening survey and  
the islands have not been part of a continuing research  
and monitoring program. Cesium-137 is the radionuclide  
that produces most of the estimated dose for returning  
residents, mostly through uptake by terrestrial foods  
and secondly by direct external gamma exposure. Remedial  
measures for reducing the {sup 137}Cs uptake in  
vegetation are discussed. 40 refs., 32 figs., 131 tabs.

5003386

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801. KEYWORD(S) NUCLEAR EXPLOSIONS/fallout ;BIKINI/radiation monitoring ;ENIWETOK/radiation monitoring ;CESIUM 137/radioecological concentration ;STRONTIUM 90/radioecological concentration ;PLUTONIUM 239/radioecological concentration ;PLUTONIUM 240/radioecological concentration ;AMERICIUM 241/radioecological concentration ;FALLOUT;TESTING; BIKINI;ENIWETOK;PLANTS;SOILS;SAMPLING;GROUND WATER; FISHES;SWINE;PARTICLE RESUSPENSION;DOSE EQUIVALENTS; REMEDIAL ACTION

## Item 22

150. REPORT NUMBER AD-A--197314/8/XAB  
 110. PRIMARY TITLE(M) Pacific Enewetak Atoll Crater Exploration (PEACE) Program, Enewetak Atoll, Republic of the Marshall Islands. Part 4. Analysis of borehole gravity surveys and other geologic and bathymetric studies in vicinity of Oak and Koa craters  
 70. PERSONAL AUTHOR(M) Henry, T.W.; Wardlaw, B.R.  
 710. CORPORATE SOURCE Geological Survey, Denver, CO (USA)  
 750. PUBL. ANNOUNCEMENT GRA-88:50252;EDB-89:009165  
 371. PUB. DATE(YMMDD) 870000  
 34. CLASSIF. LEVEL TEXT unclassified  
 950. ABSTRACT The Pacific Enewetak Atoll Crater Exploration (PEACE) Program was established to resolve a number of questions for the Department of Defense (DOD) about the geologic and material-properties parameters of two craters (KOA and OAK), formed by near-surface bursts of high-yield thermonuclear devices on the northern margin of Enewetak Atoll, Marshall Islands, in 1958. The multidisciplinary studies conducted by the USGS in collaboration with other organizations during 1984 through 1987 were part of a much larger research initiative by the DNA to better understand the dynamic properties of strategic-scale nuclear bursts and the relevance of the Pacific Proving Grounds (PPG) craters to issues of strategic basing and targeting of nuclear weapons. Major topics include: Borehole gravity; Paleontologic evidence for mixing; Electron paramagnetic resonance studies; Bathymetric studies of OAK crater; Constraints on densification and piping for OAK; and Additional studies of geologic crater models.

801. KEYWORD(S) CRATERS/boreholes ;ENIWETOK/nuclear explosions ; NUCLEAR EXPLOSIONS/craters ;BARGES;BATHYMETRY;CRATERS; BOREHOLES;DENSITY;DYNAMICS;ENIWETOK;GEOLOGIC MODELS; GEOLOGY;GRAVIMETRY;MARSHALL ISLANDS;PALEONTOLOGY; STRATIGRAPHY;YIELDS

5003387

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Item 23

150. REPORT NUMBER AD-A--109000/0  
110. PRIMARY TITLE (M) Laboratory verification of blast-induced  
liquefaction mechanism. Final report Jan-Jul '81  
70. PERSONAL AUTHOR (M) Fragaszy, R.J.; Voss, M.E.  
300. PATENT ASSIGNEE ERA-07:034634;EDB-82:085118  
371. PUB. DATE (YYMMDD) 811000  
34. CLASSIF. LEVEL TEXT unclassified  
950. ABSTRACT A mechanism for blast-induced liquefaction was  
tested in a series of high pressure undrained, isotropic  
compression tests on saturated samples of Eniwetok beach  
sand and Ottawa sand. Theory, based on inelastic volume  
compressibility of sand, was shown to be valid for the  
case of quasi-static, isotropic loading. Specimens of  
Eniwetok sand subjected to an initial effective stress  
of 1 MPa were liquefied by a single cycle of loading of  
34 MPa. Specimens of Ottawa sand, tested in the same  
manner, generated excess pore pressure but not enough to  
completely liquefy the soil. The errors introduced by  
flexibility of the testing systems were analyzed and  
found to be insignificant. Suggestions for future  
research were made.  
801. KEYWORD (S) SAND/liquefaction ;SOILS/liquefaction ;ATOMIC  
EXPLOSIONS/simulation ;SAND;LIQUEFACTION;SOILS;SOIL  
MECHANICS;FLUID MECHANICS;HIGH PRESSURE;SATURATION;  
VOLUME;STATIC LOADS;DYNAMIC LOADS;STRESS AND STRAIN;  
ENIWETOK;SIMULATION;GROUND MOTION;BLAST DAMAGE;PRESSURE  
DEPENDENCE

Item 24

90. PRIMARY TITLE (A) Rain from South and snow from North  
60. PERSONAL AUTHOR (A) Miyake, Y.  
300. PATENT ASSIGNEE EDB-82:014710  
371. PUB. DATE (YYMMDD) 541200  
34. CLASSIF. LEVEL TEXT unclassified  
950. ABSTRACT Detection of nuclear explosions by various methods.  
including observations of fission product activity in  
the atmosphere is discussed. Deposition of 750 cpm on a  
vase-line coated paper (30 x 30 cm) on May 13 to 16,  
1954 was recorded. Eighty-six thousand cpm/1 was  
observed in rain at Kyoto on May 14, apparently from the  
May 5 test at Bikini.  
801. KEYWORD (S) RAIN/radioactivity ;SNOW/radioactivity ;ATOMIC  
EXPLOSION DETECTION;/JAPAN/radiation monitoring ;RAIN;  
RADIOACTIVITY;SNOW;FISSION PRODUCTS;ATMOSPHERE;FALLOUT;  
JAPAN;BIKINI;ATOMIC EXPLOSIONS

5003388

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Item 25

150. REPORT NUMBER AD-A--078550/1  
110. PRIMARY TITLE(M) Operation Sandstone. Nuclear explosions.  
Scientific director's report of atomic weapon tests.  
Annex 17. Parts II and III. Sandia Laboratory group and  
forward area administration. Sandstone report no. 41  
750. PUBL. ANNOUNCEMENT EDB-80:107842  
371. PUB. DATE(YMMDD) 480000  
34. CLASSIF. LEVEL TEXT unclassified  
950. ABSTRACT The facts and events presented here will serve as  
a brief summary of various activities in chronological  
order which are presented for the purpose of acquainting  
those who are interested with the necessary preparations  
on the part of Sandia Base personnel who were involved  
in Operation Sandstone. This report is not meant to be a  
complete historical document and will, therefore,  
include only those phases in which Sandia Base  
(Z-Division) participated. However, in order to prepare  
this work intelligently, it is felt that a brief outline  
and overlap of the entire organization is essential  
material and worthy of review for background. The Los  
Alamos Scientific Laboratory had realized since late in  
1946 that only through field tests and actual detonation  
with proper instrumentation could the experimental  
designs of atomic weapons be proven and thereby obtain  
verification of theoretical calculations. To this extent  
then, on April 3, 1947, the General Advisory Committee  
recommended that serious consideration be given a  
proposed test program.  
801. KEYWORD(S) ATOMIC EXPLOSIONS/;ATOMIC WEAPONS/testing ;  
ENIWETOK;MANAGEMENT;PLANNING;CONSTRUCTION;TEST  
FACILITIES;TESTING;REVIEWS

Item 26

150. REPORT NUMBER WT--616  
110. PRIMARY TITLE(M) Radiobiological studies at Eniwetok before and  
after Mike shot. Project 11.5 [of] Operation Ivy  
70. PERSONAL AUTHOR(M) Donaldson, L.R.  
710. CORPORATE SOURCE Washington Univ., Seattle, WA (United States)  
371. PUB. DATE(YMMDD) 530600  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The Marine Survey Unit had as its major  
objectives: (1) the measurement of the residual  
radiation found in the living organism of Eniwetok Atoll  
as a result of previous weapons tests in this area; and  
(2) a resurvey of the area, following Mike shot, to  
determine the change in amounts, kinds, and distribution

5003389

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of radioactive materials. The field data were collected by seven specialists who collected plankton, algae, rats, birds, fish, plants, and invertebrate organisms from October 20 to November 11, 1952. The material collected was frozen for storage and shipment back to the Applied Fisheries Laboratory, where it was identified, dissected, weighed, ashed, and measured for radiation in disintegrations per minute per gram of wet sample. The pretest survey showed measurable amounts of residual radiation on and in the living organisms collected from the stations along the eastern and northern portion of the Atoll. Following Mike shot the radiation level increased many-fold, especially along the northern and western portions of the Atoll. The amount of radiation found on and in the specimens was sufficient to destroy or damage these forms over a very wide area. Subsequent studies should determine the biological half life of the materials contaminating the area, their shift in position with the currents, and the results of the contamination from radioactive materials upon the living forms of the Atoll.

801. KEYWORD(S) ANIMALS/biological radiation effects ;MIKE  
BURST/residual radiation ;RESIDUAL RADIATION/measurement  
; ENIWETOK/residual radiation ;ANIMALS;IVY;MEASUREMENT;  
PLANTS

Item 27

150. REPORT NUMBER USAF/OA/WP--25  
110. PRIMARY TITLE(M) Generalized study of the effects of A-bomb  
explosions on aircraft in flight. Operation Analysis  
Working Paper  
70. PERSONAL AUTHOR(M) Rethorst, S.; Sandborn, R.T.  
710. CORPORATE SOURCE Department of the Air Force, Washington, DC (USA)  
371. PUB. DATE(YMMDD) 510718  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This study presents a generalized method which  
will readily permit the determination of critical  
structural envelopes for aircraft exposed to atomic  
explosions. The task of defining these critical  
structural envelopes is quite involved and tedious due  
to the complicated relations governing the atmospheric  
variation with altitude, the passage of the  
atomic-explosion-caused shock wave through the  
atmosphere, and the vector effect of gusts on airfoil  
surfaces. The complexity of these relations has  
necessitated the use of a lengthy iteration and  
interpolation procedure to determine the envelope for  
any aircraft/atomic weapon situation, which must be  
repeated for any other particular case. This generalized

5003390

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method has been applied to the current list of USAF aircraft, and tables are included showing the danger and lethal volumes for all such aircraft for all stockpile atomic weapon sizes. Several recommendations are presented.

801. KEYWORD(S) AIRCRAFT/blast damage ;AIRCRAFT/gust loading ;  
GREENHOUSE//;ATMOSPHERIC BURSTS/kill probability ;  
AIRCRAFT;ATOMIC WEAPONS;GREENHOUSE

Item 28

150. REPORT NUMBER BRL--1042  
110. PRIMARY TITLE(M) Air blast loading on a three-dimensional model of  
a gabled shelter  
70. PERSONAL AUTHOR(M) Janus, R.J.; Kingery, C.N.  
710. CORPORATE SOURCE Ballistic Research Labs., Aberdeen Proving Ground,  
MD (USA)  
371. PUB. DATE(YMMDD) 580100  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The air-blast loading on a three-dimensional model  
of a gabled shelter has been investigated in a shock  
tube in order to provide data which could be used to  
formulate design criteria for a blast-resistant  
structure. The loading was divided into two phases.  
Diffraction loading was recorded by means of  
piezo-electric gages located at various points on the  
surface of the model. The pressure-time records  
resulting from this instrumentation were supplemented by  
pressure distribution studies made by the interferometer  
method (two-dimensional). Drag loading was studied with  
a transient balance. The data obtained by the different  
methods were correlated and good agreement was found.  
The methods of applying shock tube data to field  
conditions are presented. With these methods, the  
piezo-gage pressure-time records are compared to records  
obtained in the field and show a good agreement. 10  
references.  
801. KEYWORD(S) GREENHOUSE//;UPSHOT-KNOTHOLE//;SHELTERS/blast  
loading ;GREENHOUSE;UPSHOT-KNOTHOLE;DRAG;SHELTERS

Item 29

150. REPORT NUMBER EGG--1606  
110. PRIMARY TITLE(M) Factors influencing image rendition in the  
photography of nuclear detonations  
70. PERSONAL AUTHOR(M) Hawkins, D.H.  
710. CORPORATE SOURCE Edgerton, Germeshausen and Grier, Inc., Boston, MA  
(USA)  
371. PUB. DATE(YMMDD) 571115  
34. CLASSIF. LEVEL TEXT Unclassified

5003391

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## 950. ABSTRACT

Factors which influence the photography of nuclear detonations are studied. Atmosphere scattering, lens flare, and turbidity at the emulsion are each given attention. Nuclear test films from Operation Castle are analyzed primarily for contrast rendition and edge sharpness, in the hope that methods will be found to improve photographic results in the future and in addition provide some basis for predicting such results under given weather and photogrammetric conditions.

## 801. KEYWORD(S)

CASTLE/photography ; ATMOSPHERIC BURSTS/photography ; CASTLE; PHOTOGRAPHY

## Item 30

## 150. REPORT NUMBER

DASIAC-SR--68

## 110. PRIMARY TITLE(M)

Nuclear weapon test photographic data

## 710. CORPORATE SOURCE

General Electric Co., Santa Barbara, CA (USA).

DASA Information and Analysis Center

## 371. PUB. DATE(YMMDD)

671226

## 34. CLASSIF. LEVEL TEXT

Unclassified

## 950. ABSTRACT

This report describes technical weapon test films and photographs available for inspection in the DASA Information and Analysis Center as November 1967. Documentary film descriptions are contained in the first six pages of the report. Afterward, the descriptions are arranged alphabetically by shot name, and sub-arranged by camera station when significant. Operations covered include Buster-Jangle, Tumbler-Snapper, Ivy, Upshot-Knothole, Castle, Plumbbob, Hardtack I, Dominic, and Fishbowl Series.

## 801. KEYWORD(S)

ATOMIC WEAPON TESTS/photography ;  
BUSTER-JANGLE/photography ; CASTLE/photography ;  
DOMINIC/photography ; HARDTACK/photography ;  
IVY/photography ; PLUMBBOB/photography ;  
TUMBLER-SNAPPER/photography ; UPSHOT-KNOTHOLE/photography ;  
PHOTOGRAPHY; CASTLE; DOMINIC; HARDTACK; IVY; PLUMBBOB;  
TUMBLER-SNAPPER; UPSHOT-KNOTHOLE

## Item 31

## 150. REPORT NUMBER

POR--4050

## 110. PRIMARY TITLE(M)

Air blast measurements recorded by standard and developmental instrumentation. Final report. Proj 1.1/1.4 of Operation Sailor Hat

## 70. PERSONAL AUTHOR(M)

Reisler, R.E.; Raley, R.J.; LeFevre, D.P.

## 710. CORPORATE SOURCE

Ballistic Research Labs., Aberdeen Proving Ground, MD (USA)

## 371. PUB. DATE(YMMDD)

670713

## 34. CLASSIF. LEVEL TEXT

Unclassified

## 950. ABSTRACT

The objective of Project 1.1 was to obtain

5003392

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pressure time information in the moderate to high pressure region from the detonation of two 1500-ton hemispherical TNT charges. Field testing of new instrumentation systems for Operations Bass Drum and Distant Plain was carried out in fulfillment of Project 1.4 objectives. Electronic and self-recording instrumentation systems were used to record the air blast parameters along the land surface in the range from 20 to 9000 feet from ground zero. The air blast data was found to correlate with Operation Snow Ball; minor deviations occurred in the low pressure region where wind conditions altered the magnitude of the blast wave.

801. KEYWORD(S) SAILOR HAT/instrumentation ; SAILOR HAT/blast measurements ; INSTRUMENTATION; BLAST WAVES; TNT; MIDGET FLY; DISTANT PLAIN; SNOW BALL

Item 32

150. REPORT NUMBER WT--28  
110. PRIMARY TITLE (M) Development of the Chemical Corps dosimeter. Annex 5.1: Annex C [of] scientific director's report of atomic weapon tests at Eniwetok, 1951. Operation Greenhouse  
70. PERSONAL AUTHOR (M) Wilson, G.B.  
710. CORPORATE SOURCE Chemical and Radiological Labs., Army Chemical Center, MD (USA)  
371. PUB. DATE (YYMMDD) 520100  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The development of the Chemical Corps color-changing radiation dosimeter to be tested in Operation Greenhouse is summarized. The absorption of radiation by moist chloroform results in the formation of hydrochloric acid which in turn produces color changes in the alkaline indicator dyes, neutral red (NR) and the potassium salt of tetrabromophenolphthalein ethyl ester (TBP). Two different types of dosimeters, which are identical in construction, were developed. The more sensitive type or low range dosimeter uses NR as an indicator and covers the dosage range from 50 r to 400 r in four steps while the slightly less sensitive high range dosimeter uses TBP as an indicator and covers the dosage range from 100 r to 600 r in four steps. Each instrument consists of an aluminum container containing four neutral glass bottles with plastic screw caps. Each cap is colored to match the bottle contents after the dosage indicated by the bottle has been received. The aluminum container consists of a double tube arrangement which permits four small windows to be opened or closed by rotation of the inner tube. Details for the preparation of chemicals are given.

5003393

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801. KEYWORD(S) CHEMICAL DOSEMETERS//;GREENHOUSE//;GREENHOUSE;COLOR

## Item 33

150. REPORT NUMBER RAND-RM--4037-PR  
 110. PRIMARY TITLE(M) Note on persisting radio propagation effects after high-altitude nuclear bursts  
 70. PERSONAL AUTHOR(M) Crain, C.M.  
 710. CORPORATE SOURCE RAND Corp., Santa Monica, CA (USA)  
 371. PUB. DATE(YMMDD) 640300  
 34. CLASSIF. LEVEL TEXT Unclassified  
 950. ABSTRACT A theoretical interpretation is given of the abnormal ionization in the atmosphere, such as that produced by the Teak and Orange bursts, which can affect radio propagation over a wide area for as long as two weeks after the detonation. Such ionization results from the beta and gamma radiation arising from the decay of fission products produced by the burst. For this study, it is assumed that the debris is homogeneously spread over a circular area centered on the burst and that it has representative decay and spectral characteristics. Typical electron production distribution for the homogeneous layer of fission debris at over 90-kilometer altitude and typical daytime and nighttime natural and debris production profiles for low altitude are plotted. The analysis indicates that the discernible propagation effects from Teak- and Orange-type bursts can be expected to occur and to prevail for several days after the burst. 7 references.

801. KEYWORD(S) TEAK BURST/radio interference ;ORANGE BURST/radio interference ;RADIO INTERFERENCE//; IONOSPHERIC BURSTS/radio interference ;IONIZATION; BETA PARTICLES; GAMMA RADIATION;FISSION PRODUCTS;BOMB DEBRIS;WAVE PROPAGATION

## Item 34

150. REPORT NUMBER XRD--211  
 110. PRIMARY TITLE(M) Aerological report on Operation Crossroads. [Vol. III of III Vol.]. Operation Crossroads  
 371. PUB. DATE(YMMDD) jdate  
 34. CLASSIF. LEVEL TEXT Unclassified  
 950. ABSTRACT (See Vol. I and Vol. II as XRD-209 and XRD-210, respectively) Meteorological data obtained during April-July 1946 in the vicinity of Marshall Islands are presented in the report.

801. KEYWORD(S) BIKINI/meteorology ;ENIWETOK/meteorology ; RONGELAP/meteorology ;RONGERIK/meteorology ; UTIRIK/meteorology ;MARSHALL ISLANDS/meteorology ;BIKINI; METEOROLOGY;ENIWETOK;RONGELAP;RONGERIK;UTIRIK

5003394

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Item 35

150. REPORT NUMBER WADC-TR--52-244-Vol.4  
110. PRIMARY TITLE(M) Effects of atomic explosions on aircraft. Volume  
IV. Correlation of theory and experiment  
70. PERSONAL AUTHOR(M) Doherty, C.S.  
710. CORPORATE SOURCE Air Force Wright Air Development Center,  
Wright-Patterson AFB, OH (USA)  
371. PUB. DATE(YMMDD) 530415  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This volume presents the results obtained from  
both the flight and ground programs of Operation  
Greenhouse. There are also presented some results of the  
structural proof-testing program which was carried out  
at the Aberdeen Proving Ground under the direction of  
M.I.T. The above results of the Greenhouse Operation are  
correlated with the theory that was developed by M.I.T.  
for predicting the response of aircraft to a blast wave.  
Many difficulties were encountered in effecting a  
meaningful correlation between experiment and theory.  
However, in those cases where most of the variables were  
determinable, sufficient correlation is available to  
justify the theory.  
801. KEYWORD(S) GREENHOUSE;/AIRCRAFT/blast loading ; DOG  
BURST/effects experiments ;EASY BURST/effects  
experiments ;GEORGE BURST/effects experiments ;ATOMIC  
WEAPON DELIVERY/delivery hazards ;GREENHOUSE;AIRCRAFT;  
BLAST DAMAGE;ATOMIC EXPLOSIONS;CORRELATIONS

Item 36

150. REPORT NUMBER FWE--19  
110. PRIMARY TITLE(M) Symposium of the physical effects of atomic  
weapons. Paper No. 14. The base surge: the mechanism of  
fall-out. Foreign weapon effects reports  
70. PERSONAL AUTHOR(M) Hicks, E.P.; Penny, W.G.  
710. CORPORATE SOURCE Ministry of Defence, Aldermaston (United Kingdom).  
Atomic Weapons Research Establishment  
371. PUB. DATE(YMMDD) 540924  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This report is a quantitative discussion of a  
possible physical mechanism of droplet growth under  
conditions similar to those which are believed to have  
occurred in the base surge of the underwater explosion  
(Baker Burst) at Bikini. The phenomenon is presumably at  
least partly analogous to more common examples of the  
development of rain within mists, or even clouds, under  
appropriate meteorological conditions. The theories of  
droplet growth discussed have been developed from

5003395

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earlier theoretical studies by Smoluchowski and Langmuir. The theoretical treatment in this report is new only in points of detail, but numerical results obtained differ widely in many respects from those deduced for analogous problems, because of the extreme meteorological conditions in the base surge.

801. KEYWORD(S) BASE SURGE;/UNDERWATER BURSTS/fallout ;FALLOUT;/DROPLETS;BAKER BURST;FALLOUT

Item 37

150. REPORT NUMBER BRL-MR--889  
110. PRIMARY TITLE(M) Air blast loading on three-dimensional scale models of dome shape  
70. PERSONAL AUTHOR(M) Rines, E.  
710. CORPORATE SOURCE Army Armament Research and Development Command, Aberdeen Proving Ground, MD (USA). Ballistics Research Lab.  
371. PUB. DATE(YMMDD) 550400  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT More than one hundred curves are presented for air blast loading on scale models of structure 3.2.6 of Operation Greenhouse. This work was requested by the Bureau of Yards and Docks, Department of the Navy, and carried out as an extension of AFSWP Project 3.28.1. Explanation of the curves has been given so that they may be used for comparison with the results of full scale tests and of other experiments in shock tubes.  
801. KEYWORD(S) STRUCTURES/blast loading ;GREENHOUSE/effects experiments ;STRUCTURES;SHOCK TUBES;GREENHOUSE;SHOCK-TUBE STUDIES;MODEL STUDIES;BLAST MODEL STUDIES

Item 38

150. REPORT NUMBER WT--61  
110. PRIMARY TITLE(M) Sandia Corporation Proving Ground Group. Part I. Engineering, Section A. Modifications to and facilities of the weapon assembly ship. Annex 9.2 [of] scientific director's report of atomic weapon tests at Eniwetok, 1951. Operation Greenhouse  
70. PERSONAL AUTHOR(M) Treibel, W.E.; Gilbert, C.L.  
710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (USA)  
371. PUB. DATE(YMMDD) 510800  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This report contains engineering data regarding the modifications to and facilities of the weapon assembly ship for Operation Greenhouse. A broad perspective of these requirements may be obtained from a review of Greenhouse Report, Annex 9.2, Part VIII, WT-39.

5003396

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801. KEYWORD(S) SUPPORT VESSELS//GREENHOUSE/support vessels ;  
GREENHOUSE

Item 39

150. REPORT NUMBER WT--60 (Ref.)  
110. PRIMARY TITLE (M) US Army structures. Appendix 2. As-built  
construction. Annex 3.1 (parts I, II, III and IV) [of]  
scientific director's report of atomic weapon tests at  
Eniwetok, 1951. Operation Greenhouse  
710. CORPORATE SOURCE Ammann and Whitney, New York (USA)  
371. PUB. DATE (YYMMDD) 511100  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT (This report consists of four separately bound  
parts.) The as-built construction drawings of the US  
Army structures used at Operation Greenhouse are given  
in this appendix.  
801. KEYWORD(S) GREENHOUSE//STRUCTURES/design ;GREENHOUSE;  
STRUCTURES;DESIGN

Item 40

150. REPORT NUMBER WT--1  
110. PRIMARY TITLE (M) Instrumentation for structures program. Part I.  
Annex 3.4 [of] scientific director's report of atomic  
weapon tests at Eniwetok. Operation Greenhouse  
70. PERSONAL AUTHOR (M) Northrop, P.A.  
710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (United States)  
371. PUB. DATE (YYMMDD) 510100  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT Instruments are described which were used to  
measure the blast effects on the structures during  
Operation Greenhouse. Measurements made on buildings  
included air pressure, acceleration, displacement,  
strain, earth pressure, footing pressure and  
time-of-break measurements. In addition Stimascope  
(sound-time-in materials) tests, Whittemore strain gage  
tests, surveying measurements, and natural periods of  
vibration measurements, were made before, and repeated  
after, the blast. The magnitude of the task limited the  
type of end measurements to the simplest that would give  
adequate information. Availability, cost, and ease with  
which gage responses could be remotely recorded on  
magnetic tape, were also controlling factors in the  
selection of the instruments used. A list of the  
equipment, photographs, diagramatic drawings and wiring  
circuits, and data from preliminary tests of the  
equipment are included.  
801. KEYWORD(S) GREENHOUSE/instrumentation ;STRUCTURES/blast  
loading ; BUILDINGS/blast loading ;ACCELEROMETERS;

5003397

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DISPLACEMENT GAGES; GREENHOUSE; INSTRUMENTATION; PRESSURE  
GAGES; STIMASCOPES; STRUCTURES; SOUND TRANSMISSION

Item 41

150. REPORT NUMBER XRD--176  
110. PRIMARY TITLE (M) Vycor glass gamma ray dosimeters. Appendix No. 20.  
Director of Ship Material report. Operation Crossroads  
70. PERSONAL AUTHOR (M) Eicher, M.; Friedman, H.  
371. PUB. DATE (YYMMDD) 470203  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT (Also issued as NP-3076). Experiments were performed on fused quartz, silica glasses, soda-lime glass, and nonex glass in order to determine which was best suited as a color-changing dosimeter. None of the glossy materials showed critical temperatures for bleaching as was found in crystal quartz. Vycor glass (96% SiO<sub>2</sub>) offered an acceptable compromise between sensitivity and stability against heat. The dosages measured by the vycor glass ranged from 100 r to 20,000 r. The principle of darkening of vycor glass by {gamma} rays proved to be applicable for a rugged, simple dosimeter suitable for use by military and civilian personnel.  
801. KEYWORD (S) CROSSROADS/effects experiments ; DOSEMETERS/performance ; CROSSROADS; DOSEMETERS; PERFORMANCE; GLASS

Item 42

150. REPORT NUMBER DOFL-TR--795  
110. PRIMARY TITLE (M) Effects of pulsed nuclear radiation on nonoperating tubes and transistors  
70. PERSONAL AUTHOR (M) Chandler, H.G.  
710. CORPORATE SOURCE Diamond Ordnance Fuze Labs., Washington, DC (USA)  
371. PUB. DATE (YYMMDD) 591120  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT During Operation Hardtack, electron tubes of both ceramic and glass construction and transistors were exposed to nuclear radiation while they were not functioning. These components were subjected to neutron bombardment as great as  $4 \times 10^{14}$  Pu<sup>239</sup> nvt. No deleterious effects on the electron tubes were observed under these conditions. However, measured transistor parameters suffered large percentage changes from radiation greater than  $3 \times 10^{13}$  Pu<sup>239</sup> nvt. These effects were much greater in audio than in r-f types. 4 references.  
801. KEYWORD (S) ELECTRON TUBES/radiation effects ; TRANSISTORS/radiation effects ; HARDTACK; NEUTRONS

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## Item 43

150. REPORT NUMBER NRDL-TR--719  
 110. PRIMARY TITLE (M) Estimates of radiation geometry and energy responses for the USNRDL Model 1954-56 Gamma-Intensity-Time Recorder (GITR)  
 70. PERSONAL AUTHOR (M) Rinnert, H.R.  
 710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (USA)  
 371. PUB. DATE (YYMMDD) 640122  
 34. CLASSIF. LEVEL TEXT Unclassified  
 950. ABSTRACT Estimates of instrumentation response to gamma radiation having various energy spectra and source geometries are presented for the Gamma-Intensity-Time Recorder (GITR) that was used to obtain radiation data at Operations Castle, Wigwam, and Redwing. The GITR's responses to gamma radiation were estimated for several idealized source geometries and a variety of calculated gamma energy spectra as a function of time. The estimated response values are presented as fractions of each detector's calibration response to Co{sup 60} radiation beamed at the side of that detector when separated from its four-detector installation. The estimated values of GITR response to radiological environments likely to be encountered in the field did not appear to depend significantly upon time after fission nor upon exact knowledge about energy spectra or source geometries. However, it was estimated that the technique used to calibrate the GITR's resulted in slightly biased data; i.e., the calibrated doses or dose rates were estimated to be between 10 and 20% too low. 8 references.

801. KEYWORD (S) GAMMA DETECTION;/CASTLE/instrumentation ; WIGWAM/instrumentation ; REDWING/instrumentation ; RADIATION DETECTORS;/CASTLE;WIGWAM;REDWING;COBALT 60; RESPONSE FUNCTIONS;CALIBRATION

## Item 44

150. REPORT NUMBER WES-TR--2-590  
 110. PRIMARY TITLE (M) Design and analysis of underground reinforced-concrete arches  
 70. PERSONAL AUTHOR (M) Flathau, W.J.; Sager, R.A.; Luzi, F.A.  
 710. CORPORATE SOURCE Army Engineer Waterways Experiment Station, Vicksburg, MS (USA)  
 371. PUB. DATE (YYMMDD) 620100  
 34. CLASSIF. LEVEL TEXT Unclassified  
 950. ABSTRACT Comparisons were made of six loading methods used to predict the ground-surface air-overpressure from

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40-KT and 20-MT weapons required to collapse (a) selected, underground, reinforced-concrete arch structures of fixed and two-hinged end conditions, and (b) the buried, concrete-arch structures of PLUMBBOB Project 3.1. The Equivalent Surcharge method, which assumes failure at the threshold of the compression regime, appeared to be the most suitable for the design of structures located above the ground-water table regardless of the direction of the blast front. For structures located below the ground-water table, the Uniform Compression Mode was the most suitable. A method of predicting radiation transmission for use in the design of buried structures is given. Procedures and sample calculations for the design of footings, floor slabs, and end walls are presented in Appendix A. Sample calculations for the response of a specific arch under each of the loading methods are presented in Appendix B. Appendix C presents results of a study to establish the ductility factor at the threshold of the compression regime. 13 references.

801. KEYWORD(S) HARDTACK/;PLUMBBOB/;UNDERGROUND STRUCTURES/blast loading ;UNDERGROUND STRUCTURES/design ;REINFORCED CONCRETE/blast loading ;HARDTACK;PLUMBBOB;PRESSURE TESTING;DESIGN;CALCULATIONS

Item 45

150. REPORT NUMBER NRDL-TR--152  
110. PRIMARY TITLE(M) Investigation and correlation of some physical parameters of fall-out material  
70. PERSONAL AUTHOR(M) Williamson, W. Jr.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (USA)  
371. PUB. DATE(YMMDD) 570328  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT An attempt has been made to correlate some of the fundamental physical parameters of fall-out material. Parameters discussed are color and shape, activity, size, weight, and density. What little correlation that was possible among accumulated data is presented together with residual error.

801. KEYWORD(S) FALLOUT/physical properties ;REDWING/fallout ;TEWA BURST/fallout ;ZUNI BURST/fallout ;FALLOUT;COLOR; PARTICLE SIZE;WEIGHT; DENSITY;SHAPE;REDWING

Item 46

150. REPORT NUMBER DASA--1970  
110. PRIMARY TITLE(M) High altitude tests measurement summary  
710. CORPORATE SOURCE General Electric Co., Santa Barbara, CA (USA).

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## DASA Information and Analysis Center

371. PUB. DATE (YYMMDD) 670900

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT

This is a brief summary of weapons effects measurements made during the US high-altitude tests, Operation Hardtack, 1958 (Events Yucca, Teak, and Orange), Operation Argus, 1958 (Events 1, 2, and 3), and Operation Fish Bowl, 1962 (Events Star Fish, Check Mate, Blue Gill, King Fish, and Tight Rope). Detailed information about the measurements could not be included as the resulting summary would have been extraordinarily long. This detailed information, as well as test results, may be found in the reports cited in the Bibliography section.

801. KEYWORD (S)

ARGUS EFFECT//FISH BOWL//HARDTACK//RADIATION BELTS//STARFISH BURST//CHECK MATE BURST//BLUE GILL BURST//KING FISH BURST//TIGHT ROPE BURST//BLAST MEASUREMENTS//ELECTROMAGNETIC RADIATION//HARDTACK//IONOSPHERE//PHOTOGRAPHY//RADIATION DETECTION

## Item 47

150. REPORT NUMBER NRDL-TR--347

110. PRIMARY TITLE (M) Atmospheric reactions of slurry droplet fallout

70. PERSONAL AUTHOR (M) Farlow, N.H.

710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (USA)

371. PUB. DATE (YYMMDD) 590402

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT

The evaporation, growth and physical properties of slurry fallout particles descending through the atmosphere are quantitatively examined by application of established cloud-physics equations. An arithmetic system of analysis is proposed and applied to radioactive slurry fallout particles collected at Operation REDWING. Reasonable agreement between observed and calculated particle properties supports the validity of applying this method to other meteorological situations where volatile droplet fallout may occur. 37 references.

801. KEYWORD (S)

FALLOUT//REDWING/fallout ;UNDERWATER BURSTS/fallout ;SLURRIES;FALLOUT;REDWING;PARTICLES;DROPLETS

## Item 48

150. REPORT NUMBER NRDL-TR--314

110. PRIMARY TITLE (M) Activity-size relationship of fallout particles from two shots, Operation Redwing

70. PERSONAL AUTHOR (M) Chan, H.K.

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710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE (YYMMDD) 590219  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The activity of coral fallout particles was studied as a function of individual size. Single particles from two shots at Operation Redwing were sized and identified as being of a spheroidal, irregular or dendrite-like type and then measured for gamma activity. Two particle size parameters were employed, equivalent projected area diameter ( $D_{\text{sub a}}$ ) and maximum diameter ( $D_{\text{sub m}}$ ). The study shows that an extensive range of activities is associated with each size and size-type group. Field data taken at one station indicate that the activities of a size-type group follow a normal distribution. According to the same data the activity varies as  $D_{\text{sub a}}^{\text{sup } 2-2}$  and  $D_{\text{sub m}}^{\text{sup } 1} \text{ }^{\text{sup } 7}$  for irregular particles,  $D_{\text{sub a}}^{\text{sup } 2} \text{ }^{\text{sup } 7}$  for spheroidal particles, and  $D_{\text{sub m}}^{\text{sup } 2} \text{ }^{\text{sup } 1}$  for dendrite-like particles.  
801. KEYWORD (S) FALLOUT/particle size ; FALLOUT/radioactivity ; REDWING/fallout ; FALLOUT; RADIOACTIVITY; REDWING; SHAPE; GAMMA RADIATION

Item 49

150. REPORT NUMBER NRDL-TR--208  
110. PRIMARY TITLE (M) Nature of individual radioactive particle. VI.  
Fallout particles from a tower shot operation Redwing  
70. PERSONAL AUTHOR (M) Adams, C.E.; O'Connor, J.D.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE (YYMMDD) 571202  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Studies were made of the structure and composition of, and the distribution of radioactivity within, the fallout particles resulting from a tower shot in Operation REDWING. Techniques utilizing the petrographic microscope and x-ray diffraction analysis were employed. Three types of fallout particle were found. The most common type was formed by the interaction of the vaporized iron and radioactive elements with molten calcium oxide derived from the coral sand which was carried up into the fireball by atmospheric turbulence. These particles consisted of an outer zone of radioactive dicalcium ferrite surrounding an inactive residual core of altered calcium oxide. The second type consisted almost wholly of radioactive iron oxide and apparently was formed by the melting and oxidation of part of the steel tower. The third type consisted of

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unmelted coral sand grains which had small black, radioactive spheres adhering to their surfaces. 3 references.

801. KEYWORD(S) REDWING/fallout ;FALLOUT/microstructure ;  
FALLOUT/chemical composition ;REDWING;FALLOUT;PARTICLES;  
X-RAY DIFFRACTION;CALCIUM COMPOUNDS

## Item 50

150. REPORT NUMBER NRDL-TR--147  
110. PRIMARY TITLE(M) 4- $\pi$  gamma ionization chamber decay measurements  
of fallout samples from operation Castle  
70. PERSONAL AUTHOR(M) Shipman, W.H.; Lai, J.R.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE(YMMDD) 560113  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Certain fallout samples from Operation Castle were  
retained for decay rate measurement. The exponent of the  
equation  $A_{\text{sub } t} = A_{\text{sub } 0} t^{\text{sup } -k}$  was evaluated  
from appropriate log-log plots and found to be in the  
range 1.1 to 2.03. This range of values is larger than  
that expected from thermal-neutron fission.  
801. KEYWORD(S) CASTLE/fallout ;FALLOUT/decay ;CASTLE;FALLOUT;  
DECAY;IONIZATION CHAMBERS;GAMMA RADIATION

## Item 51

150. REPORT NUMBER NRDL-TR--139  
110. PRIMARY TITLE(M) Fall-out forecasting technique with results  
obtained at the Eniwetok ground  
70. PERSONAL AUTHOR(M) Schuert, E.A.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE(YMMDD) 570403  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT A generalized fall-out forecasting technique is  
presented with detailed computations of input parameters  
which were used at Eniwetok Proving Ground. Results  
obtained at a recent weapons tests are briefly discussed  
by comparison of forecast fall-out with preliminary  
measured data.  
801. KEYWORD(S) FALLOUT/forecasting ;ENIWETOK PROVING  
GROUND/fallout ;REDWING/fallout ;FALLOUT;FORECASTING;  
ATOMIC WEAPON TESTS;REDWING

## Item 52

150. REPORT NUMBER NRDL-TR--127  
110. PRIMARY TITLE(M) Fall-out plotting device

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710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)

371. PUB. DATE (YYMMDD) 561130

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT A fallout plotting device was developed. The method requires no drafting equipment and is ideally suited for field use. At Operation Redwing it was found that untrained personnel could quickly become proficient in its employment.

801. KEYWORD (S) FALLOUT/measurement ; REDWING/fallout ; FALLOUT; MEASUREMENT; REDWING

## Item 53

150. REPORT NUMBER NRDL-TR--364

110. PRIMARY TITLE (M) Identification of micron-sized, insoluble-solids fallout particles collected during Operation Redwing

70. PERSONAL AUTHOR (M) Schell, W.R.

710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)

371. PUB. DATE (YYMMDD) 590924

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT Fallout from REDWING shots Flathead and Navaho, detonated on barges anchored in shallow water, is described. The insoluble solids formed by the vaporization and subsequent condensation of the barge, coral ballast, fission products, and environmental sea salts were analyzed through electron diffraction, electron microscopy, emission spectrography, photomicrography, and x-ray diffraction. These insoluble solids were found to consist primarily of spherical particles less than 1  $\mu$  in diameter and to be composed of compounds and elements consistent with the environmental materials. 5 references.

801. KEYWORD (S) FALLOUT/chemical composition ; FALLOUT/microanalysis ; FLATHEAD BURST/fallout ; NAVAHO BURST/fallout ; FALLOUT; MICROANALYSIS; REDWING; SOLIDS; ELECTRON DIFFRACTION; ELECTRON MICROSCOPY; MICROSCOPY; X-RAY DIFFRACTION; PARTICLES

## Item 54

150. REPORT NUMBER NRDL-TR--363

110. PRIMARY TITLE (M) Analysis of standard-platform wind bias in fallout collection at Operation Redwing

70. PERSONAL AUTHOR (M) Chan, H.K.

710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)

371. PUB. DATE (YYMMDD) 590916

34. CLASSIF. LEVEL TEXT Unclassified

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## 950. ABSTRACT

At Operation Redwing, fallout sampling was conducted by arrays or groups of similar collecting instruments. Each array was located on the periphery of an elevated and circular wind-shielded platform designated as the standard platform. A correlation of the sampling variations in the amounts of fallout collected within the platforms was accomplished by the analysis of the collection data and the platform's air-flow characteristics. With a single-wind system the amount of fall-out collected in the upwind part of the platform was lower than that collected in the downwind section and the collections around the platform varied symmetrically with respect to the wind direction. With a multi-wind system, similar characteristics were exhibited about a reference direction which was correlated to the variability of wind directions and associated fallout amounts by a vector summation. The extent of sampling variation or collection bias in both systems can be defined by certain parameters. For each platform the values of these parameters were obtained from the properties of a collection curve describing the variation around the platform. Collective curves of both systems were completed by interpolation and their notable aspect is that they resemble sine curves. At the only land station the sampling data between the platform collection and the associated collection on the ground was too limited for extrapolation to other systems. Sampling relationships between platform collection and associated ground collection are described for the single-wind system but not for the multi-wind system. At the ship stations the equivalent ground value of the platform collections i.e., the value that would be collected by the earth's surface, could not be determined; however, the weighted mean values of some of these platform collections are presented. 10 references.

## 801. KEYWORD(S)

REDWING/fallout ;FALLOUT/sample collection ;  
REDWING;FALLOUT;WIND;SAMPLING;AIR SAMPLERS

## Item 55

150. REPORT NUMBER SC--2090(Tr)  
110. PRIMARY TITLE(M) Natural frequencies of structure 3.1.1  
70. PERSONAL AUTHOR(M) Jacobsen, L.S.; Wells, W.M.  
710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (USA)  
371. PUB. DATE(YMMDD) 511102  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT Preshot and postshot measurements of the natural frequencies of the seven buildings comprising structure 3.1.1 were made using a mechanical shaker and pickups measuring displacements. Using these measurements it was

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possible to calculate the stiffness changes caused by the blast loading. Calculated values of the preshot frequencies, assuming a rigid foundation, were considerably greater than the measured values. Ground stiffnesses calculated from the measured frequencies appear to be of the correct order of magnitude. Damping ratios calculated from the resonance curves are low compared with values obtained by other experimenters.

801. KEYWORD(S) GREENHOUSE/ground motion ;STRUCTURES/blast loading ;GREENHOUSE;STRUCTURES

Item 56

150. REPORT NUMBER NOLTR--64-103  
110. PRIMARY TITLE(M) Physics of the base surge  
70. PERSONAL AUTHOR(M) Young, G.A.  
710. CORPORATE SOURCE Naval Ordnance Lab., White Oak, MD (USA)  
371. PUB. DATE(YMMDD) 650617  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The column and base surges formed by the underwater nuclear explosion (Test Baker) in Operation Crossroads in 1946 were measured in detail. The new data were used to formulate a physical explanation of the base surge behavior and to develop prediction techniques. The primary surge originated as a spillout of sea-water jets which broke into spray and formed a dense toroidal shaped cloud. Computations were made for the coalescence and rainout of drops and a theory was developed for the mixing of the surge with the air. The late behavior was strongly influenced by the convectively unstable atmosphere and the high relative humidity. The effects of other meteorological conditions were described. 232 references.

801. KEYWORD(S) BAKER BURST/base surge ;BAKER BURST/column formation ;HUMIDITY

Item 57

150. REPORT NUMBER NOLTR--62-191  
110. PRIMARY TITLE(M) Liquid model studies of the base surge  
70. PERSONAL AUTHOR(M) Swift, E. Jr.  
710. CORPORATE SOURCE Naval Ordnance Lab., White Oak, MD (USA)  
371. PUB. DATE(YMMDD) 621001  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT When a constrained column of dense liquid standing on the bottom of a tank of water is released suddenly, it sinks and flows outward radially along the bottom. This action simulates the early motion of the base surge from shallow underwater explosions. Such liquid model experiments are described, scaling laws are derived, and

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comparisons with CROSSROADS Baker are made. It is estimated that between 100,000 and 130,000 tons of water in the Baker column contributed to the surge, that the column height was between 3500 and 4000 feet, and that the column density was between 1.4 and 1.6 times that of air. 7 references.

801. KEYWORD(S) BASE SURGE/model studies ; UNDERWATER  
EXPLOSIONS/base surge ; BAKER BURST/base surge ;  
SIMULATION; SCALING LAWS

Item 58

150. REPORT NUMBER NRDL-TR--178  
110. PRIMARY TITLE(M) Field beta-gamma dose-rate meter  
70. PERSONAL AUTHOR(M) Devlin, F.A.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE(YMMDD) 570500  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT

A thin polyethylene chamber ionization detector has shown remarkable beta flux sensitivity. It was found that by adding a removable beta flux discriminator to the chamber it was practicable to differentiate between the beta component and the gamma component of the flux coming from a contaminated field. Laboratory experiments and field data substantiate the practicability of the system described. The gamma energy dependence of the detector was found to be a maximum of 17% high relative to Co<sup>60</sup>.

801. KEYWORD(S) IONIZATION CHAMBERS/beta detection ; IONIZATION  
CHAMBERS/gamma detection ; POLYETHYLENES; BETA PARTICLES;  
GAMMA RADIATION; REDWING; DESIGN; PERFORMANCE

Item 59

150. REPORT NUMBER LA--1126  
110. PRIMARY TITLE(M) Thermal effects of atomic bomb explosions on soils  
at Trinity and Eniwetok  
70. PERSONAL AUTHOR(M) Staritzky, E.  
710. CORPORATE SOURCE Los Alamos Scientific Lab., NM (USA)  
371. PUB. DATE(YMMDD) 500613  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT

Samples of soils from Trinity and Eniwetok, thermally altered as a result of the test shots of 1945 and 1948, were examined. At Trinity a crust of vesicular silicate glass covers the ground over an area of about 2000 feet diameter. The amount of glass formed is estimated as  $17 \times 10^8$  grams. Petrographic evidence indicated that temperatures exceeding  $1470^\circ\text{C}$  were reached throughout this area. Spectrographic

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analysis of samples of glass and parent soil showed that the melt was not superheated by more than a few hundred degrees in any portion of the area sampled. The amount of energy which went into forming the glass is estimated as  $(4.3 \pm 0.5)10^{19}$  ergs. Because of exceptionally unfavorable conditions on Eniwetok, no definite information could be obtained from the examination of samples of coral sands collected after the Sandstone shots.

801. KEYWORD(S)

SOILS/thermal radiation effects ; GLASS/thermal radiation effects ; TRINITY BURST/effects experiments ; SANDSTONE; SOILS; ENIWETOK; GLASS; THERMAL RADIATION

Item 60

150. REPORT NUMBER AFSWP--155  
110. PRIMARY TITLE (M) Residual radiation pattern for various surface  
wind velocities-underwater atomic burst; staff study  
70. PERSONAL AUTHOR (M) Gibson, T.A. Jr.  
371. PUB. DATE (YYMMDD) 520314  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This study concerns the event of an underwater atomic explosion in a harbor. Estimates are made of the extent and magnitude of the residual radiation field as a function of surface wind velocity, by using information available from the Bikini-Baker underwater explosion.

801. KEYWORD(S)

UNDERWATER BURSTS/residual radiation ; HARBORS/radioactive contamination ; BIKINI/residual radiation ; BAKER BURST/; BASE SURGE/residual radiation ; HARBORS; WIND; FALLOUT

Item 61

150. REPORT NUMBER WT--1685  
110. PRIMARY TITLE (M) Radiological safety. Operation Hardtack  
70. PERSONAL AUTHOR (M) Jacks, G.L.; Zimmerman, G.C.  
710. CORPORATE SOURCE Los Alamos Scientific Lab., NM (USA)  
371. PUB. DATE (YYMMDD) 581115  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Descriptions are given of the mission, organization and activities of Task Unit 6, Task Group 7.1, Joint Task Force Seven, during Operation Hardtack. Task Unit 6 was charged with the responsibility of providing radiological safety support for the Scientific Task Group, TG7.1. Radiological survey results of the atolls following firing of the various devices are presented. Special problems arising during the operation are discussed.

801. KEYWORD(S)

HARDTACK/radiation monitoring ; ENIWETOK PROVING

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GROUND/radiation monitoring ;FALLOUT/radiation  
monitoring ;HARDTACK;FALLOUT;RADIATION HAZARDS

Item 62

150. REPORT NUMBER SC--2463 (PR)  
110. PRIMARY TITLE (M) Monthly progress report. June 1952. Technical  
Services Department  
710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (USA)  
371. PUB. DATE (YYMMDD) 520600  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT General progress made by the Sandia Corporation  
during June is detailed. Preparations are being made for  
Ivy, and as a result of instrument feasibility tests at  
Tumbler/Snapper, a number of the more satisfactory  
instruments are being built in Sandia shops for early  
shipment and installation for both shots of Operation  
Ivy. Conditions at storage sites are reviewed, and the  
status of stockpile is noted.  
801. KEYWORD (S) IVY;/STORAGE SITES;/WAR RESERVE MATERIEL;/  
TUMBLER-SNAPPER;/IVY;ATOMIC WEAPONS;ATOMIC WARHEADS;  
TUMBLER-SNAPPER

Item 63

150. REPORT NUMBER MIT-AE--97  
110. PRIMARY TITLE (M) Summary of visible damage to aircraft during  
Operation Greenhouse  
70. PERSONAL AUTHOR (M) Hobbs, N.P.; Levy, L.  
710. CORPORATE SOURCE Massachusetts Inst. of Tech., Cambridge (USA)  
371. PUB. DATE (YYMMDD) 520818  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT A summary is given, in table form, of visible  
damage to aircraft resulting from atomic explosions  
during Operation Greenhouse. Drone and manned aircraft  
were utilized for the tests for the purpose of  
determining moderate or ultimate load factors incurred  
in the atomic explosions.  
801. KEYWORD (S) GREENHOUSE/effects experiments ;AIRCRAFT/thermal  
radiation effects ;AIRCRAFT/blast damage ; ATMOSPHERIC  
BURSTS/effects experiments ;GREENHOUSE;AIRCRAFT

Item 64

150. REPORT NUMBER ASD-TR--61-60  
110. PRIMARY TITLE (M) Simplified method for predicting thermal radiation  
in the vicinity of nuclear detonations  
70. PERSONAL AUTHOR (M) Vergamini, P.L.  
710. CORPORATE SOURCE Dayton Univ., OH (USA)  
371. PUB. DATE (YYMMDD) 610500

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34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT

Simplified, empirical equations are presented which allow determination of the incident thermal radiation on a receiver in the vicinity of a nuclear detonation. The equations are essentially curve fits to the thermal energy values calculated by the Chapman and Seavey prediction technique (AFCRC-TN-54-25) for both ground and air bursts and for a variety of atmospheric and geophysical parameters. The simplified equations correlate very well with the thermal energy data obtained during Operation Redwing. The thermal energy equations for the specific type days standardized by the Air Force in their nuclear weapons capabilities studies are included in the report. Sample calculations employing the simplified equations and a summary of the pertinent equations are presented in appendixes. 5 references.

801. KEYWORD(S) THERMAL RADIATION;/ATOMIC EXPLOSIONS/thermal radiation ;ATMOSPHERIC BURSTS/thermal radiation ; REDWING;/AIRCRAFT INSTRUMENTS; SURFACE BURSTS;REDWING; EQUATIONS;SAFE SEPARATION TIME;FORECASTING

Item 65

150. REPORT NUMBER LA--3409-MS(Suppl.)

110. PRIMARY TITLE(M) Prompt air fluorescence excited by high altitude nuclear explosions. Photoelectric instrumentation and the high altitude fluorescence (HAF) and high altitude resonance absorption calculation (HARAC) codes

70. PERSONAL AUTHOR(M) Bennett, E.W.; Holland, R.F.

710. CORPORATE SOURCE Los Alamos Scientific Lab., NM (USA)

371. PUB. DATE(YMMDD) 660504

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT Details of the design, calibration, and use of the photoelectric log box detectors used to obtain air fluorescence data are given. Descriptions of the High Altitude Fluorescence (HAF) and High Altitude Resonance Absorption Calculation (HARAC) machine codes are presented. These sections are concerned mainly with assumptions, derivations, and some program features of the codes; no coding details are provided. The procedures used to obtain absorption cross sections for use in HARAC are described, including a discussion of the assumptions and the approximation used to account for the rotational structure. The importance of some neglected processes is discussed. Results of calculations on specific events and their use in analysis of the Dominic and Hardtack air fluorescences data are given in the classified part of this report.

801. KEYWORD(S) ATMOSPHERIC BURSTS/teller light ;FLUORESCENCE/;

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OPTICAL DETECTION/; AIR/fluorescence ;FLUORESCENCE;  
PHOTOELECTRIC EMISSION;DOMINIC;HARDTACK;HARAC CODE;HAF  
CODE

Item 66

150. REPORT NUMBER MIT-CSE--7  
110. PRIMARY TITLE (M) Analysis of gravity dams subjected to underwater  
explosions. (Interim report)  
710. CORPORATE SOURCE Massachusetts Inst. of Tech., Cambridge (USA)  
371. PUB. DATE (YYMMDD) 530701  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This is an analytical study of the loading and  
response of various types of dams when they are  
subjected to underwater or surface detonations. The  
objectives of the project to establish the physical  
vulnerability of dams are not only to collect  
information defining the loading under such conditions  
and to develop suitable methods for computing the  
response, but also to compute the response of several of  
the more common types of concrete gravity dams.  
Contained in the study is a summary of the data now  
available on phenomena associated with shallow ater  
explosions, and of the methods whereby this data has  
been used to predict the loading imposed on the dams.  
Also discussed are methods used for computing the  
response of gravity dams both prior to and after  
cracking. The application of these computational  
procedures and loading data have been illustrated by  
using a medium high-bead straight gravity dam as an  
example. Several conclusions pertaining to the blast  
effects on this type of dam are presented.  
801. KEYWORD (S) DAMS/blast damage ;DAMS/blast loading ;DAMS;BAKER  
BURST;SCALING LAWS; SHOCK HYDRODYNAMICS;UNDERGROUND  
SHOCK WAVES;SURFACE EXPLOSIONS; UNDERWATER SHOCK WAVES

Item 67

150. REPORT NUMBER DASA--2309  
110. PRIMARY TITLE (M) Review of artificial radiation belts, Explorer 4;  
unidirectional trapped radiation, Injun 1. Final report  
70. PERSONAL AUTHOR (M) Manson, D.J.; Fennell, J.F.; George, J.A.  
710. CORPORATE SOURCE Saint Louis Univ., MO (USA)  
371. PUB. DATE (YYMMDD) 690531  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The final results of Explorer 4 analyses relating  
to artificial radiation belts (events TEAK, ORANGE and  
ARGUS) are presented in Chapters 1 and 2. Angular  
distributions of unidirectional trapped radiation (for  
natural radiation and pre- and post-Starfish) for Injun

5003411

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1 data appear in Chapter 3. The principal results are contained in Chapter 4, including (1) comparison of Explorer 4 and Injun 1 data, (2) lifetimes for artificial belts, and (3) diffusion for ARGUS. 28 references.

801. KEYWORD(S) ORANGE BURST/radiation belts ;TEAK BURST/radiation belts ;RADIATION BELTS/;DATA PROCESSING;EXPLORER

Item 68

150. REPORT NUMBER WT--954  
110. PRIMARY TITLE(M) Radioactivity of open-sea plankton samples.  
Project 2.7a [of] Operation Castle  
70. PERSONAL AUTHOR(M) Folsom, T.R.; Jennings, F.D.; Johnson, M.W.  
710. CORPORATE SOURCE Scripps Institution of Oceanography, La Jolla, CA  
(USA)

371. PUB. DATE(YYMMDD) 580418  
34. CLASSIF. LEVEL TEXT Official Use Only

950. ABSTRACT The general relationship pertinent to the uptake of fission products by marine organisms is reported in order to form a background for more extensive tests on Wigwam. Gross beta activities, beta absorption curves and gamma spectra were analyzed, after identification of the organisms. A radiochemical analysis revealed: (1) that marine organisms concentrate activity from fallout fission products in the water by factors of the order of 1000, (2) that the partition of fallout fission products in the ocean is profoundly influenced by biological processes and that a purely physical model is inadequate to predict distribution, (3) that the feeding mechanism of the organism does not clearly determine the amount of activity assimilated, (4) that there is evidence of fractionation of isotopes by different organisms, and (5) that there is some evidence that finely dispersed activity is retained more or less proportionally with the dry weight of the organism.

801. KEYWORD(S) FISSION PRODUCTS/uptake ;  
MICROORGANISMS/radiochemical analysis ;  
MICROORGANISMS/radionuclide kinetics ; WIGWAM/fission products ;CASTLE/fission products ;PLANKTON/radionuclide kinetics ;UPTAKE;MICROORGANISMS;CASTLE;SEAWATER;BETA PARTICLES;GAMMA RADIATION;RADIOACTIVITY;PLANKTON

Item 69

150. REPORT NUMBER DASA--532B  
110. PRIMARY TITLE(M) High altitude sampling problem, a special report  
on  
70. PERSONAL AUTHOR(M) Stebbins, A.K. III (ed.)  
710. CORPORATE SOURCE Defense Atomic Support Agency, Washington, DC

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(USA)

371. PUB. DATE (YYMMDD) 600601

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT

(This document was previously published as DASA-532, a Special Report to the Government of Argentina.) The HASP program has operated since the fall of 1957. The sampling network using U-2 aircraft has collected  $10^{+8}$  standard cubic feet of air from  $57^{\circ}\text{S}$  to  $71^{\circ}\text{N}$  up to 70,000 ft. Ashcan data is used for upward extrapolation. IPC Paper 178 of near 100% efficiency is used. Stratospheric matter sampled is in the 0.01  $\mu$  range. The uneven distribution of material in the stratosphere has been noted. Stratospheric inventories of  $^{90}\text{Sr}$  have been calculated for the periods Nov 1957 to Dec 1958, Jan to Aug 1959, and Sep to Nov 1959 to be, respectively, 0.95, 0.81, and 0.7 MCi. Concentrations have been greater in the Northern Hemisphere by a factor of 2 or 3 over the southern Hemisphere. The  $^{90}\text{Sr}$  maximum occurs in the equatorial regions around 90,000 ft and slopes down to a round 70,000 ft in the polar regions. Little fractionation is noted in stratospheric debris.  $^{137}\text{Cs}$  to  $^{90}\text{Sr}$  ratios are 1.8 to 0.5. A semi-empirical application of Gaussian diffusion is described which suggests that hot clouds injected in the equatorial stratosphere spread in the North-South direction with mixing coefficients near  $5 \times 10^{+8}$   $\text{cm}^2/\text{sec}$ . Vertical mixing is slower with coefficients of  $4 \times 10^{+3}$  and  $2 \times 10^{+4}$   $\text{cm}^2/\text{sec}$  suggested for tropical and polar regions, respectively. An Injection-Depletion model is offered which indicates that as much as 50% of the material produced in a megaton ground surface burst becomes down in local fallout. Removal from the stratosphere occurs at different rates depending on altitude and latitude of injection and season of the year. Effective half-residence times of, respectively, 5, 10, and 20 months for polar, low equatorial and high equatorial debris is suggested. Surface concentrations of  $^{90}\text{Sr}$  are displayed as a function of latitude and time. The Northern hemisphere carries 3/4 of the burden.

801. KEYWORD (S)

FALLOUT/sampling ;HARDTACK/;HASP/;  
STRATOSPHERE/radioactivity ;RUSSIAN ATOMIC  
EXPLOSIONS/fallout ;RESIDUAL RADIATION/measurement ;  
AIRCRAFT;CESIUM 137;DOSE RATES;FALLOUT;FISSION PRODUCTS;  
HARDTACK;HASP;STRONTIUM 90;AERIAL MONITORING;RADIATION  
HAZARDS;RADIOACTIVITY;MEASUREMENT

Item 70

5003413

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150. REPORT NUMBER XRD--214  
110. PRIMARY TITLE (M) Title list of Operation Crossroads reports. Report numbers assigned for use in indexing, distribution, and control  
710. CORPORATE SOURCE USAEC Technical Information Center, Oak Ridge, TN  
371. PUB. DATE (YYMMDD) 521031  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This report is a title list and report number list assigned to the Operation Crossroads technical reports by the Technical Information Service, AEC.  
801. KEYWORD (S) CROSSROADS/bibliographies ;CROSSROADS; BIBLIOGRAPHIES;INDEXES

Item 71

150. REPORT NUMBER DASA--529  
110. PRIMARY TITLE (M) High-altitude sampling program. Progress report  
70. PERSONAL AUTHOR (M) Stebbins, A.K. III  
710. CORPORATE SOURCE Defense Atomic Support Agency, Washington, DC  
(USA)  
371. PUB. DATE (YYMMDD) 590701  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The High Altitude Sampling Program was initiated by the Joint Chiefs of Staff in 1954 to determine the spread of weapon produced fission products through the stratosphere. U-2 aircraft operated by the Strategic Air Command have been sampling stratospheric air at various altitudes along North-South paths from 66{sup 0} North to 57{sup 0} South at 70{sup 0} West since 1957. Isotopes Incorporated, the principle contractor in this program, has analyzed over 1500 samples to date. Further metrological correlation has evolved a model of the stratosphere which accounts for the non-uniform deposition of fission products. The total stratospheric inventory of {sup 90}Sr as of the Fall of 1958 was found to be 1 megacurie. The half-residence time of polar injections and equatorial injections into the stratosphere was found to be six months and twelve months, respectively. The major portion of the stratospheric debris moves into the troposphere through the mid-latitude tropopause break. Predictions of {sup 90}Sr levels to be found in equilibrium bone have been made through 1972. 6 references.  
801. KEYWORD (S) RUSSIA/atomic explosions ;HARDTACK/fallout ;HASP;/ STRATOSPHERE/sample collection ;RUSSIA;AERIAL MONITORING; CESIUM 137;STRONTIUM 90;DOSE RATES;FISSION PRODUCTS; HARDTACK;FALLOUT;HASP; RADIATION HAZARDS;RESIDUAL RADIATION;RADIOCHEMICAL ANALYSIS;STRATOSPHERE

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Item 72

150. REPORT NUMBER DASA--539B  
110. PRIMARY TITLE (M) Second special report on the high altitude  
sampling program (HASP)  
70. PERSONAL AUTHOR (M) Stebbins, A.K. III  
710. CORPORATE SOURCE Defense Atomic Support Agency, Washington, DC  
(USA)  
371. PUB. DATE (YYMMDD) 610801  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Observations made during Phases IV and V of  
Project Hasp and the conclusions drawn from them are  
presented. Included are discussions on: (1) structure  
and nature of 0.1 to 1.0 micron family of naturally  
occurring stratospheric aerosol; (2) dust layer of  
ammonium sulfate in the stratosphere; (3) stratospheric  
concentration of nuclides; (4) Sr-90 and W-185  
inventories and distributions from August 1957-May 1960;  
(5) transfer and mixing of debris; and (6) fall-out from  
Teak and Orange. Comments are made on surface fall-out  
measurements which corroborate the Hasp measurements.  
The contributions of French tests are calculated.  
Fall-out is assessed by nuclide and dose type.  
Appendices provide U-2 operational scenes, useful  
constants and conversion factors, and a summary of  
nuclear detonations. Numerous tables and illustrations  
supplement the discussions. 13 references.  
801. KEYWORD (S) TEAK BURST/fallout ;ORANGE BURST/fallout ;HASP/;  
FALLOUT;STRATOSPHERE;STRONTIUM 90; SOILS;HASP

Item 73

150. REPORT NUMBER WT--2  
110. PRIMARY TITLE (M) Japtan Island development and animal production.  
Part I. Facilities. Part II. Animal Colony. Annex 2.1  
[of] scientific director's report of atomic weapon tests  
at Eniwetok, 1951. Operation Greenhouse  
70. PERSONAL AUTHOR (M) Leroy, G.V.; Veenstra, R.J.  
371. PUB. DATE (YYMMDD) jdate  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT Since rats, goats, and pigs used in the Bikini  
test showed almost as much change in behavior and blood  
picture due to environmental changes as from the actual  
test itself, it was decided to establish colonies of  
mice, dogs, and swine on Japtan Island in preparation  
for Operation Greenhouse. The animal quarters, special  
handling equipment, laboratory, shop, and living  
quarters for personnel are described. Procedures which  
were used in breeding, cleaning, veterinary care, and

5003415

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shipping are given. A history of the entire program is included.

801. KEYWORD(S) GREENHOUSE//DOGS/handling ; SWINE/handling ;  
MICE/handling ; GREENHOUSE; DOGS; HANDLING; SWINE; MICE;  
BEHAVIOR; BIOLOGICAL RADIATION EFFECTS; BIOLOGICAL EFFECTS;  
ATOMIC EXPLOSIONS; PRODUCTION

Item 74

150. REPORT NUMBER WT--49  
110. PRIMARY TITLE(M) Meteorological data. Operation Greenhouse  
371. PUB. DATE(YMMDD) 500500  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Meteorological data of the Central Pacific area  
are presented for the period March-May 1950.  
801. KEYWORD(S) GREENHOUSE/meteorology ; ENIWETOK PROVING  
GROUND/meteorology ; GREENHOUSE; METEOROLOGY; PACIFIC OCEAN

Item 75

150. REPORT NUMBER WT--75(Ref.)  
110. PRIMARY TITLE(M) US Army structures. Appendix 3. Materials tests.  
Annex 3.1 [of] scientific director's report of atomic  
weapon tests at Eniwetok, 1951. Operation Greenhouse  
710. CORPORATE SOURCE Ammann and Whitney, New York (USA)  
371. PUB. DATE(YMMDD) 510800  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT The testing program was designed to supply  
information on the strength of the precast and  
poured-in-place concrete, the reinforcing steel, and the  
structural steel. Most of the materials were subjected  
to a number of independent tests and the values used in  
the post-test analysis were based on the results  
thereof. Data from these tests are presented in the  
report.  
801. KEYWORD(S) STRUCTURAL MATERIALS/materials testing ;  
GREENHOUSE//CONCRETES; GREENHOUSE; STEELS

Item 76

150. REPORT NUMBER WADC-TR--59-506  
110. PRIMARY TITLE(M) Absorptivity measurement by the thermal  
irradiation method  
70. PERSONAL AUTHOR(M) Mills, G.W.  
710. CORPORATE SOURCE Air Force Wright Air Development Center,  
Wright-Patterson AFB, OH (USA)  
371. PUB. DATE(YMMDD) 590900  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT A method is described for measuring thermal  
absorptivity of painted aircraft skin subjected to

5003416

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thermal radiation by a nuclear detonation. It consists of irradiating the surface with a known amount of thermal energy and measuring the energy absorbed. The methods and equipment for the measuring technique, tested in the laboratory and during Operation Redwind, were shown to be reliable, repeatable, and accurate to within a probable error of  $\pm 5$  percent. It is concluded that the absorptivity values obtained on painted panels by the thermal irradiation method define that portion of the incident energy causing a temperature rise in the panel more accurately than does a method depending on the measurement of reflected energy. 6 references.

801. KEYWORD(S)

AIRCRAFT SKIN/absorptivity ; THERMAL RADIATION/absorption ; PAINTS/absorptivity ; ABSORPTIVITY; ABSORPTION; PAINTS; ATOMIC EXPLOSIONS; REDWING; MEASUREMENT; THERMAL RADIATION EFFECTS

Item 77

150. REPORT NUMBER ITR--1630-2  
110. PRIMARY TITLE(M) Behavior of deep reinforced-concrete slabs in high-pressure regions. Project 3.6 (supplement) [of] Operation Hardtack  
70. PERSONAL AUTHOR(M) Bultmann, E.H. Jr.; Haltiwanger, J.D.; Wright, R.N. III  
710. CORPORATE SOURCE Air Force Special Weapons Center, Kirtland AFB, NM (USA) ; Illinois Univ., Urbana (USA)  
371. PUB. DATE(YMMDD) 581215  
34. CLASSIF. LEVEL TEXT Official Use Only  
950. ABSTRACT (See also ITR-1630-1.) This is a summary of all data acquired since the submission of the ITR-1630-1. The data indicate that the design criteria used to proportion the test specimens is unnecessarily conservative. Since the one-way slabs at the high-pressure level were damaged enough to define closely their dynamic strengths in flexure and diagonal tension, it will be possible to establish definitive design criteria for slabs for this type. The damage sustained by the one-way slabs at the lower pressure level was minor; however, it should be adequate to indicate the applicability or lack thereof of these design criteria to slabs under lower blast pressures. Because of the nature of the damage sustained by the two-way slabs, which apparently resulted primarily from their proximity to the crater, it will not be possible to establish design criteria for them as well defined as the criteria to be developed for the one-way slabs.

801. KEYWORD(S) STRUCTURAL ELEMENTS/blast loading ; HARDTACK; REINFORCED CONCRETE

5003417

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Item 78

150. REPORT NUMBER LAC-LMSD--288070  
110. PRIMARY TITLE(M) Absorption coefficients of air. Final summary report  
70. PERSONAL AUTHOR(M) Landshoff, R.K.M.; Buttrey, D.E.  
710. CORPORATE SOURCE Lockheed Aircraft Corp., Sunnyvale, CA (USA)  
371. PUB. DATE(YMMDD) 591000  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Research is summarized on the study of the absorption coefficients of hot gases for the analysis of nuclear fire balls and other high temperature sources. The research carried out included a theoretical calculation of the absorption coefficients of air for temperatures from 1000 to 12,000<sup>0</sup>K and for densities from 10 to 10<sup>-6</sup> times normal sea level air density. An interpretation of data taken at Operation Redwing was made concerning light absorption shells in air after passage of shocks from nuclear explosions. Experimental studies were made by the observation of spectra under shock tube conditions to ascertain optical properties of O<sub>2</sub> and N<sub>2</sub> at high temperatures. Additional absolute intensity measurements must be made in order to compare theoretical and experimental results quantitatively. Qualitatively, experimental and theoretical results are in agreement. 4 references.

801. KEYWORD(S) AIR/absorption spectra ; THERMAL RADIATION/absorption ; ATMOSPHERIC BURSTS/thermal radiation ; ATMOSPHERIC BURSTS/visible radiation ; VISIBLE RADIATION/absorption ; REDWING; ATOMIC WEAPON TESTS; BALL OF FIRE; AIR; NITROGEN OXIDES; ABSORPTION

Item 79

150. REPORT NUMBER NMDL-TP--28  
110. PRIMARY TITLE(M) Seismic studies of Eniwetok Atoll. Part I  
70. PERSONAL AUTHOR(M) McLeroy, E.G.; Dowling, G.B.  
371. PUB. DATE(YMMDD) 580600  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT As a part of the 1957 Office of Naval Research (ONR) survey of Eniwetok Atoll, seismic measurements were made to determine the bottom reflection coefficients on the outside southwest slope of the atoll. The values of the reflection coefficients are low and irregular and have been related to bottom structure. Reflections from several very thin shallow layers and from deeper layers were observed indicating a submarine geology agreeing with that found previously by other

5003418

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methods. Amplitudes and velocities of signals from refraction shots fired inside and outside the lagoon are presented. 10 references.

801. KEYWORD(S) ENIWETOK/oceanography ; ENIWETOK/seismology ;  
ENIWETOK; OCEANOGRAPHY; SEISMOLOGY; REFLECTION; SIGNALS

Item 80

150. REPORT NUMBER WDC--546  
110. PRIMARY TITLE(M) Subsurface geology of Eniwetok Atoll  
70. PERSONAL AUTHOR(M) Schlanger, S.O.  
710. CORPORATE SOURCE Geological Survey, Washington, DC (USA)  
371. PUB. DATE(YMMDD) 630000  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The subsurface geology of Eniwetok Atoll, as deduced from two holes drilled to depths of 4610 and 4158 feet, respectively, is discussed. The core samples and cottings were analyzed and are described in detail. Sections by other contributors are: (1) Carbonate Mineralogy, by Donald L. Graf and Julian R. Goldsmith; (2) Petrography of the Basalt Beneath the Limestones, by Gordon A. Macdonald; (3) Dating of Carbonate Rocks by Ionium-Uranium Ratios, by William M. Sackett and Herbert A. Potratz; and (4) Bikini and Nearby Atolls, Marshall Islands.  
801. KEYWORD(S) ENIWETOK/geology ; BIKINI/geology ; MARSHALL ISLANDS/geology ; ENIWETOK; GEOLOGY; BASALT; BIKINI

Item 81

150. REPORT NUMBER WT--937  
110. PRIMARY TITLE(M) Medical examination of Rongelap people six months after exposure to fall-out. Addendum report for project 4.1A [of] Operation Castle  
70. PERSONAL AUTHOR(M) Bond, V.P.  
710. CORPORATE SOURCE Naval Medical Research Inst., Bethesda, MD (USA) ;  
Naval Radiological Defense Lab., San Francisco, CA (USA)  
371. PUB. DATE(YMMDD) 550400  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Follow-up medical examinations were made of the inhabitants of Rongelap Atoll six months after exposure to Castle fall-out. The individuals, in general, appeared healthy and normally active, and no deaths had occurred. The skin lesions previously prominent had healed. Regrowth of hair was essentially complete. Residual of the fingernail discoloration previously noted was found in three individuals. No additional findings on physical examination could be ascribed to radiation exposure. Neutrophile, lymphocyte, and platelet counts were not significantly different from

5003419

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counts taken on the 74th post-exposure, and none of these values had returned to control levels. Studies of bone-marrow specimens revealed no significant abnormalities. Minimal amounts of residual radioactivity were detectable in the urine of approximately 1/3 of the exposed individuals.

801. KEYWORD(S) BETA PARTICLES/biological effects ;CASTLE/fallout ;  
MAN/biological radiation effects ;BONE MARROW;CASTLE;  
FALLOUT;HEMATOLOGY; RADIATION HAZARDS;MAN;URINE;RONGELAP;  
RESIDUAL RADIATION

Item 82

150. REPORT NUMBER WT--936  
110. PRIMARY TITLE(M) Nature and extent of internal radioactive  
contamination of human beings, plants, and animals  
exposed to fallout. Addendum report for project 4.1 [of]  
Operation Castle  
70. PERSONAL AUTHOR(M) Cohn, S.H.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(United States); Naval Medical Research Inst., Bethesda,  
MD (United States)

34. CLASSIF. LEVEL TEXT Official Use Only

950. ABSTRACT The objectives of this study of internal  
radioactive contamination are as follows: (1) To  
determine the nature and extent of the internal  
radiation hazard to human beings exposed to the fall-out  
from Bravo Burst. (2) To evaluate the contribution of  
the internal contamination to the acute and long-term  
radiation syndrome. (3) To determine the feasibility of  
an internal decontamination therapy program. (4) To  
determine the amount and type of contamination sustained  
by exposed animals, food plants, soil, and water of the  
contaminated atolls. Evaluation of the internal  
contamination of the human beings was made by a study of  
the radioelements excreted. Since very little  
information is presently available concerning the ratio  
of excreted radioelements to the amount deposited in the  
body, it was necessary to base the evaluation on data  
obtained from animals that had been contaminated in the  
same event. Detailed studies of animal tissues and  
animal excreta then provided data on which estimates of  
the human body burden were based.

801. KEYWORD(S) ANIMALS/radioactive contamination ;  
ANIMALS/biological radiation effects ;MAN/radioactive  
contamination ;MAN/biological radiation effects ;  
PLANTS/radioactive contamination ;PLANTS/biological  
radiation effects ;CASTLE/fallout ;BRAVO BURST/fallout ;  
ANIMALS;MAN;PLANTS;CASTLE;FALLOUT; RADIATION HAZARDS

5003420

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## Item 83

150. REPORT NUMBER NRDL--455  
110. PRIMARY TITLE (M) Residual contamination of plants, animals, soil,  
and water of the Marshall Islands two years following  
Operation Castle fall-out  
70. PERSONAL AUTHOR (M) Weiss, H.V.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE (YYMMDD) 560815  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The amount and distribution of radioactive  
material remaining on several atolls and incorporated  
into plants and animals of the Marshall Islands was  
determined two years after their contamination by  
fall-out from the March 1, 1954 nuclear detonation of  
Operation CASTLE. Readily detectable amounts of  
radioactive contamination were found in animals, plants  
and soil. Most of the activity in the edible portion of  
plants and soil. Most of the activity in the edible  
portion of plant specimens was contributed by  
cesium-137. The major radionuclides found in the tissues  
of fish was zinc-65, and that in clams, cobalt-60.  
Residual soil contamination remained confined to the  
surface.  
801. KEYWORD (S) CASTLE/residual radiation ;FALLOUT/uptake ;  
MARSHALL ISLANDS/radioactive contamination ;PLANTS;  
ANIMALS;SOILS;CASTLE;ENVIRONMENTAL STUDIES;FALLOUT;  
UPTAKE;CESIUM 137; ZINC 65;COBALT 60;ECOSYSTEMS

## Item 84

150. REPORT NUMBER NRDL--454  
110. PRIMARY TITLE (M) Residual contamination of plants, animals, soil,  
and water of the Marshall Islands one year following  
Operation Castle fall-out  
70. PERSONAL AUTHOR (M) Rinehart, R.W.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE (YYMMDD) 550812  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The amount and distribution of radioactive  
materials remaining on several atolls and incorporated  
into flora and fauna of the Marshall Islands was  
determined one year after their contamination by  
fall-out. Significant amounts of radioactive  
contamination were found in animals, food plants,, water  
and soil samples. Highest concentrations of internally  
deposited activity were found in marine specimens taken

5003421

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from the northern Rongelap lagoon. Most of the activity in marine specimens was contributed by Zr{sup 95}-Nb{sup 95} and Ru{sup 106}-Rh{sup 106}. No fractionation of Sr{sup 89}- Sr{sup 90} occurred in tissue of fish analyzed. Residual soil contamination was confined to top several inches of soil, with movement indicated down to the lens water. The major radionuclide found in the tissues of land animals and plants was Cs{sup 137}. The island soil and lagoon water were contaminated principally by rare earth elements, Ru{sup 106}-Rh{sup 106} and Zr{sup 95}-Nb{sup 95}. Amount of activity in specimens analyzed was generally proportional to external gamma reading in each of the areas.

801. KEYWORD(S)

CASTLE/residual radiation ;FALLOUT/uptake ;  
MARSHALL ISLANDS/radioactive contamination ;PLANTS;  
ANIMALS;WATER;SOILS;CASTLE;ENVIRONMENTAL STUDIES;  
ZIRCONIUM 95; RUTHENIUM 106;RHODIUM 106;CESIUM 137;  
ECOSYSTEMS;FALLOUT;UPTAKE

Item 85

150. REPORT NUMBER WT--1661  
110. PRIMARY TITLE(M) Proof test of AN/TVS-1 (XE-3) flash-ranging  
equipment. Project 6.14 [of] Operation Hardtack  
70. PERSONAL AUTHOR(M) Scarborough, G.D.; Van Sant, J.S.  
710. CORPORATE SOURCE Army Signal Research and Development Lab., Fort  
Monmouth, NJ (USA)  
371. PUB. DATE(YMMDD) 610124  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT (Supersedes ITR-1661) The overall objective of  
this project was to evaluate the Peerless flash-ranging  
set, AN/TVS-1 (XE-3), prior to its acceptance by the  
United States Army Signal Research and Development  
Laboratory (ASRDL). The specific objectives were to  
determine the operational capability of two types of  
automatic shutter-activating units and to compile data  
on shutter speeds and filter values at different ranges  
from point of burst of various low-yield nuclear  
devices. The project participated in eight detonations  
at the Nevada Test Site (NTS). Consistent, reliable  
operation of the equipment tested was obtained at 18  
miles from burst. This distance was the maximum  
line-of-sight range that was available for a suitable  
observation point. Although both types of automatic  
shutter-activating units performed equally well under  
conditions of high visibility such as existed during the  
test participations, the modified version was varied  
transmission factors such as existed during the test  
participations, the modified version was considered most  
applicable. Camera settings were kept constant, but

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neutral-density filters of varied transmission factors were experimentally employed. No recommendation for an overall optimum filtering can be made, because samples included only low-yield detonations and cannot be correlated to higher yields, varying ranges, and changing ambient light conditions.

801. KEYWORD(S) HARDTACK/optical detection ;OPTICAL DETECTION/;  
OPTICAL RANGE FINDERS/;HARDTACK

Item 86

150. REPORT NUMBER XRD--173  
110. PRIMARY TITLE(M) Hemorrhagic syndrome of acute ionizing radiation illness produced in goats and swine by exposure to the atomic bomb at Bikini, 1946. Appendix No. 15. Director of ship material report. Operation Crossroads  
70. PERSONAL AUTHOR(M) Cronkite, E.P.  
371. PUB. DATE(YMMDD) 481007  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Goats and Swine were exposed at varying distances to the bursts at Operation Crossroads in order to study the hemorrhagic effects of bomb radiations. It was considered that all pathologic phenomena observed were the result of {gamma} radiation, either at the time of the explosion or from {gamma} emission of residual radiation. In general, the hemorrhagic syndrome could be divided into three stages: that of increased capillary fragility; increased capillary fragility plus a progressive thrombopenia; increased capillary fragility, thrombopenia, and a blood coagulation defect. The blood coagulation defect was observed only in fatally irradiated animals in which terminal bacterial invasion was also prominent. A circulating anticoagulant was shown to be present 10d to 12d after exposure, and it could be neutralized in vitro by toluidine blue and to a lesser extent by thrombin and thromboplastin. Evidence was presented suggesting that fibrinolysins may have been activated or increased in concentration.

801. KEYWORD(S) CROSSROADS/effects experiments ;GOATS/biological radiation effects ;SWINE/biological radiation effects ;  
HEMORRHAGE/radioinduction ;IONIZING  
RADIATIONS/biological effects ;CROSSROADS;GOATS;SWINE;  
HEMORRHAGE;RADIOINDUCTION

Item 87

150. REPORT NUMBER XRD--172  
110. PRIMARY TITLE(M) Effect of the Bikini atomic bomb Test Able on soil microorganisms. Appendix No. 14. Director of ship material report. Operation Crossroads

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70. PERSONAL AUTHOR(M) Wenzel, M.E.; Smith, N.R.  
371. PUB. DATE(YMMDD) 461204  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Eleven samples each of Houston black clay, Caribou loam, and Decatur silty clay loam were exposed to Able Burst of Operation Crossroads in order to determine the effects of the explosion radiation on soil microorganisms. Microbiological analysis consisted of making dilutions of 10 g of the samples in steps of 10X from 10 to 100,000 in sterile water and then using appropriate dilutions to inoculate certain media to determine the numbers of microorganisms by the resulting growth. The total counts of all samples of the Houston clay were below that of the control samples kept in Beltsville, Md. In the Caribou loam the actinomycetes and fungi counts were quite uniform, the protozoa was very low, nitrite-formers low but definitely higher than in the Houston clay, and the nitrate-formers were absent. In the Decatur loam all except four of the fungi and five of the actinomycetes counts were higher than the controls. All samples except one showed a few protozoa. All samples contained 1000 or more nitrate bacteria per gram. The nitrate bacteria were low in all samples. Since there was no information as to the treatment the soil samples received at Bikini, it seemed from the analyses that the microorganisms were not injured to any appreciable extent.

801. KEYWORD(S) CROSSROADS/effects experiments ;  
MICROORGANISMS/biological radiation effects ;  
SOILS/microorganisms ;ABLE BURST/effects experiments ;  
CROSSROADS;MICROORGANISMS;SOILS

Item 88

150. REPORT NUMBER XRD--166  
110. PRIMARY TITLE(M) Statistical analysis of hematologic (red blood cell count) data on pigs. Test Able. Appendix No. 5. Director of ship material report. Operation Crossroads  
371. PUB. DATE(YMMDD) 471013  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Hematologic studies were made on swine exposed to the Test A radiation. Red blood counts (RBC) were tabulated prior to the test. There was a decline in the RBC subsequent to the tests; however, the depression was not as drastic as was observed for the white blood counts (WBC). There were 26 animals that experienced WBC reductions and of these, 17 died. The swine which died had lower minimum RBC than those that lived. The minimum WBC occurred within 96 hr, and the lowest RBC did not appear until 16 d to 22 d following the explosion. When

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comparisons were made collectively between RBC and WBC for all swine with WBC reductions, it was found that during the first 5-d period the average WBC dropped to 26% of normal and the RBC to 88% of normal. During the second period the RBC declined to the 81% level. From this period through the fourth, the WBC increased while the RBC dropped to 65%. From the fourth through the tenth period, the WBC showed a very slow recovery, while by the tenth period, the RBC had reached the 95% mark. During the last two months of study the RBC was above normal, and the WBC reached 75% of normal.

## 801. KEYWORD(S)

ABLE BURST/effects experiments ;ANIMALS/biological radiation effects ;HEMATOPOIETIC SYSTEM/biological radiation effects ;SWINE/biological radiation effects ; ANIMALS;BLAST DAMAGE;SWINE

## Item 89

150. REPORT NUMBER WT--938

110. PRIMARY TITLE(M) Exposure of Marshall Islanders and American military personnel to fallout. Project 4.1 addendum [of] Operation Castle

70. PERSONAL AUTHOR(M) Sharp, R.; Chapman, W.H.

710. CORPORATE SOURCE Naval Medical Research Inst., Bethesda, MD (United States)

371. PUB. DATE(YYMMDD) 570300

34. CLASSIF. LEVEL TEXT Official Use Only

950. ABSTRACT This addendum to Project 4.1 (See WT--923)

contains the following supplementary data regarding the exposed Marshallese: (1) a detailed sketch of Rongelap Village; (2) a brief description of the islanders' homes and their food and water supplies; (3) the various family groups and the location of their dwellings; (4) events during fallout; (5) the evacuation and decontamination procedures; and (6) readings of the external radioactive contamination of these individuals.

## 801. KEYWORD(S)

CASTLE/fallout ;MAN/radioactive contamination ; MILITARY PERSONNEL/radioactive contamination ;MARSHALL ISLANDS/fallout ;CASTLE;FALLOUT;DECONTAMINATION;MAN; RONGELAP

## Item 90

150. REPORT NUMBER WT--923

110. PRIMARY TITLE(M) Study of response of human beings accidentally exposed to significant fallout radiation. Final report. Project 4.1 [of] Operation Castle

70. PERSONAL AUTHOR(M) Cronkite, E.P.

710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (United States); Naval Medical Research Inst., Bethesda,

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MD (United States)

371. PUB. DATE (YYMMDD) 541000

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT

Following the detonation on Bikini Atoll on March 1, 1954, 28 Americans and 239 Marshallese were exposed to fallout. The radiation dosages received by the individuals ranged from 14--175 r. Some immediate effects observed were mild nausea, burning of the eyes, and itching of the skin. Later, signs of radiation injury included epilation and the development of spotty, superficial, hyperpigmented skin lesions that desquamated from the center of the lesions outward. All lesions healed rapidly with no further breakdown of the skin noted during the observation period. In those individuals in which hematologic changes were definite, lymphopenia appeared promptly and persisted for a prolonged period of time. The most consistent hematologic change was the depression in the platelet counts. Urinary excretion of radioisotopes was studied. From this it was determined that ingestion and inhalation of isotopes did not contribute significantly to the initial radiation exposure.

801. KEYWORD (S)

CASTLE/fallout ; HEMATOPOIETIC SYSTEM/biological radiation effects ; MAN/biological radiation effects ; CASTLE;FALLOUT;HEMATOLOGY;MAN;SKIN;RADIATION DOSES

Item 91

150. REPORT NUMBER WT--602

110. PRIMARY TITLE (M) Air shock pressure-time versus distance. Project 6.1 [of] Operation Ivy

70. PERSONAL AUTHOR (M) Rollosso, G.W.

710. CORPORATE SOURCE Sandia Corp., Albuquerque, NM (USA)

371. PUB. DATE (YYMMDD) 530400

34. CLASSIF. LEVEL TEXT Unclassified

950. ABSTRACT

Pressure-time vs. distance measurements were made on Mike and King Bursts of Operation Ivy. Mike Burst offered an opportunity to verify experimentally the applicability of the  $W^{1/3}$  scaling law at large yields; and on King Burst it was possible to observe the development of the shock waveform over land and over water. The scaling law was found to be valid for yields as large as the Mike yield. Overpressures from Mike Burst are in agreement with the assumption that the pressures to be expected from a yield,  $W$ , burst at the surface of a perfect reflector, are the same as would be observed from a yield of  $2W$ , burst in free air. Measurements on King Burst showed that the waveform over water was nearly ideal, whereas that over land was subject to deterioration as a result of the thermal and

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precursor effects. The height-of-burst chart can be extended to yields of the order of 500 KT. Semiquantitative measurements of shock symmetry are described in Appendix A.

801. KEYWORD(S) KING BURST/blast measurements ;KING BURST/yield ;  
KING BURST/pressure-distance studies ;MIKE BURST/blast  
measurements ;MIKE BURST/yield ;MIKE  
BURST/pressure-distance studies ;HEIGHT OF BURST;IVY;  
YIELD;SCALING LAWS;DISTANCE;PRESSURE MEASUREMENT

Item 92

150. REPORT NUMBER NAVORD-R--6156  
110. PRIMARY TITLE(M) Frequency-modulation magnetic-tape playback system  
70. PERSONAL AUTHOR(M) Torpy, D.J.  
710. CORPORATE SOURCE Naval Ordnance Lab., White Oak, MD (USA)  
371. PUB. DATE(YMMDD) 580801  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Data recording systems which make use of  
frequency-modulation of a carrier signal recorded on  
magnetic tape are subject to noise resulting from speed  
variations in the recording or playback mechanisms. This  
report describes a playback system which reduces this  
noise by utilizing a constant-frequency signal recorded  
simultaneously with the data signal, but on a different  
channel of the tape, to obtain a measure of the speed  
variations. By using this information, the system  
reduces the noise to a fixed level which is independent  
of the magnitude of the speed variations. This playback  
system was designed for use in connection with Hardtack  
Project 1.1 and was used in processing the magnetic tape  
information obtained in the field. 2 references.

801. KEYWORD(S) ATOMIC WEAPON TESTS/magnetic recording systems ;  
ATOMIC WEAPON TESTS/data processing ;NOISE;HARDTACK;  
INSTRUMENTATION

Item 93

150. REPORT NUMBER WT--59  
110. PRIMARY TITLE(M) US Air Force structures. Appendix E. Blast loading  
and structural response. Section 1. General blast  
loading and response. Annex 3.3 [of] scientific  
director's report of atomic weapon tests at Eniwetok,  
1951. Operation Greenhouse  
70. PERSONAL AUTHOR(M) Pettitt, B.E.  
710. CORPORATE SOURCE Air Force Air Materiel Command, Wright-Patterson  
AFB, OH (USA). Air Installations Div. ;Armour Research  
Foundation, Chicago, IL (USA)  
371. PUB. DATE(YMMDD) 510300  
34. CLASSIF. LEVEL TEXT Official Use Only

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## 950. ABSTRACT

The loading problem is to predict the forces imposed on an isolated structure which is struck by a given blast wave moving across the structure in a direction normal to one of its faces, and the net horizontal and vertical forces as function of time are found for the period during which the structure is immersed in the wave. The development of the loading method was accomplished by a study of known theory and existing experimental data. Data obtained by shock tube studies were combined with theory to produce a set of fundamental parameter plots and a rational load-computation method. Equations of motion, used in the prediction of response, are discussed and possible alternate methods of solutions are given. Subjects for future investigations are discussed.

## 801. KEYWORD(S)

GREENHOUSE/effects experiments ; STRUCTURES/blast loading ; GREENHOUSE; STRUCTURES; SHOCK TUBES; BLAST MODEL STUDIES

## Item 94

## 150. REPORT NUMBER

WT--3

## 110. PRIMARY TITLE (M)

Alkali halide and phosphate glass radiological casualty dosimeters. Annex 5.1. Annex A [of] scientific director's report of atomic weapon tests at Eniwetok, 1951. Operation Greenhouse

## 70. PERSONAL AUTHOR(M)

Alger, R.S.; Dyson, J.P.; Levy, R.A.; McQuilling, D.W.

## 710. CORPORATE SOURCE

Naval Radiological Defense Lab., San Francisco, CA (USA)

## 371. PUB. DATE (YYMMDD)

510700

## 34. CLASSIF. LEVEL TEXT

Official Use Only

## 950. ABSTRACT

The production by ionizing radiations of color centers in alkali halide crystals and fluorescent centers in Ag-bearing phosphate glasses was investigated as a basis for casualty-badge radiation dosimeters. Doses of 25 r of  $^{60}\text{Co}$   $\gamma$  rays were detected by visible color changes in KBr and KCl crystals sensitized by heating in a combined atmosphere of alkali vapor and hydrogen. The sensitivity of the phosphate glass is comparable to that of the crystals, but a reading device is needed for the fluorescent measurements. The crystals and glasses are strongly energy- dependent for x-ray energies below about 150-kV effective. The crystals and glasses can be bleached by strong illumination in their respective optical absorption bands; consequently, the exposed dosimeter elements must be shielded from light between observations. In a test bomb detonation the crystals and glasses were exposed to total dosages of 17 to 4460 r at

5003428

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varying dosage rates. In general, there was good agreement among the dosage readings for samples of a given material but the readings for different materials varied from 0.81 to 2.3 times the readings obtained with National Bureau of Standards (NBS) film badges.

801. KEYWORD(S)

DOSEMETERS//; GAMMA DOSIMETRY//; ALKALI METALS;  
DOSEMETERS; GREENHOUSE; GLASS; FLUORESCENCE; COLORATION;  
BLEACHING; ATOMIC EXPLOSIONS; ATOMIC WEAPON TESTS

Item 95

150. REPORT NUMBER SWC-TR--57-26  
110. PRIMARY TITLE(M) Study of the effectiveness of gloves for the  
reduction of the contact radiation hazard associated  
with contaminated aircraft  
70. PERSONAL AUTHOR(M) Banks, J.E.; Dick, J.L.; Pulliam, J.M.  
710. CORPORATE SOURCE Air Force Special Weapons Center, Kirtland AFB, NM  
(USA)  
371. PUB. DATE(YMMDD) 570900  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Results are reported of experiments conducted  
during Operations Teapot and Redwing to evaluate the  
value of gloves to give radiation protection to  
personnel working on contaminated aircraft. Tests  
indicated that gloves reduce radiation hazard to the  
whole hand by 40 percent and to small areas near hot  
spots by 60 percent. Recommendation is made that all  
personnel having contact with contaminated aircraft be  
required to wear one of the following types of gloves:  
(a) vinyl-coated cotton, (b) a combination of surgical  
rubber and broadcloth, or (c) leather flying gloves with  
liners. 2 references.

801. KEYWORD(S)

PERSONNEL/radiation protection ; GLOVES//;  
AIRCRAFT/radioactive contamination ; PROTECTIVE  
CLOTHING/performance ; RADIATION HAZARDS; REDWING;  
MATERIALS TESTING; TEAPOT; PERSONNEL; GLOVES; PERFORMANCE;  
HANDS/radiation protection; COTTON; TEXTILES

Item 96

150. REPORT NUMBER NRDL-TR--86  
110. PRIMARY TITLE(M) Internal radioactive contamination of human beings  
accidentally exposed to radioactive fallout material  
70. PERSONAL AUTHOR(M) Cohn, S.H.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA  
(USA)  
371. PUB. DATE(YMMDD) 560509  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The first instance of exposure of human beings to  
significant internal contamination with fission products

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occurred as a result of the ingestion and inhalation of fallout material from a nuclear detonation in the Spring of 1954. An evaluation of the nature and extent of this internal radioactive contamination was made by a comparison of the radioelements excreted by the exposed human beings with data obtained from radiochemical analysis of the tissues and excreta of animals contaminated in the same event. The body burden of the group of human beings with the greatest internal contamination was near but did not exceed the maximum permissible levels for the individual radionuclides. Radioiodine and radiostrontium were present in highest concentrations at early times after exposure and were potentially the greatest internal hazard. The contribution of the internal radiation to the acute radiation syndrome observed appears to be small on the basis of the estimated body burden of the the principal radioelements. In view of the short half-life of the most-abundant fission products in this situation, the possibility that chronic irradiation effects will occur is quite small.

## 801. KEYWORD(S)

MAN/radioactive contamination ;MAN/radionuclide kinetics ;FALLOUT/uptake ;CASTLE/fallout ; ANIMALS/radioactive contamination ;MAN;FALLOUT;UPTAKE; ATOMIC EXPLOSIONS; INHALATION;INGESTION;IODINE ISOTOPES; STRONTIUM ISOTOPES;CASTLE;ANIMALS;EXCRETION; PERSONNEL MONITORING;BODY BURDEN

## Item 97

150. REPORT NUMBER

NRDL-TR--170

110. PRIMARY TITLE(M)

Physical, chemical, and radiological properties, of slurry particulate fall-out collected during Operation Redwing

70. PERSONAL AUTHOR(M)

Farlow, N.H.; Schell, Wr.

710. CORPORATE SOURCE

Naval Radiological Defense Lab., San Francisco, CA (USA)

371. PUB. DATE(YMMDD)

570505

34. CLASSIF. LEVEL TEXT

Unclassified

950. ABSTRACT

The properties of individual fallout particles produced by nuclear detonations at zero height over shallow sea water are analytically described for the first time. The particles produced during operation REDWING were slurry masses composed of water, dissolved and crystalline sea salts, and seawater-insoluble solids from the weapon, barge, and ocean floor. Special techniques were used to measure the chloride, water, and insoluble-solids content of individual slurry particles. Autoradiography showed that the activity is primarily associated with the solids. A table of experimental data

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presents particle size versus time of arrival after detonation as well as measurements of particle density and relative specific activity. Estimates of mass and relative activity of fallout per unit area for certain locations about the shot point are shown.

801. KEYWORD(S)

FALLOUT/chemical composition ;FALLOUT/physical properties ;REDWING/fallout ;SURFACE BURSTS/fallout ; FALLOUT;PARTICLES;REDWING;AUTORADIOGRAPHY;PARTICLE SIZE; TIME OF ARRIVAL; CHLORIDES;WATER;SLURRIES

Item 98

150. REPORT NUMBER NRDL-TR--137  
110. PRIMARY TITLE(M) Relationship of time of peak activity from fall-out to time of arrival  
70. PERSONAL AUTHOR(M) La Riviere, P.D.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (USA)  
371. PUB. DATE(YMMDD) 570228  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT The time of arrival ( $t_{\text{sub a}}$ ), time of peak ( $t_{\text{sub p}}$ ), and time of cessation ( $t_{\text{sub c}}$ ) of fall-out are shown by related equations where the times are hours after detonation. These relations are shown to apply over a wide range of arrival times, yields, and scaled depths.

801. KEYWORD(S)

FALLOUT/time of arrival ;FALLOUT/decay ; CASTLE/fallout ;GREENHOUSE/fallout ;REDWING/fallout ; TEAPOT/fallout ; WIGWAM/fallout ;FALLOUT;DECAY;ATOMIC EXPLOSIONS;CASTLE;DOSE RATES;GAMMA RADIATION;GREENHOUSE; REDWING;TEAPOT

Item 99

150. REPORT NUMBER NRDL-TR--166  
110. PRIMARY TITLE(M) Salt concentration in the air at Bikini Atoll: a preliminary study  
70. PERSONAL AUTHOR(M) Evans, E.C. III  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (USA)  
371. PUB. DATE(YMMDD) 570515  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT This preliminary study conducted at the Bikini Atoll investigated the variation of salt concentration in the first 300 ft of atmosphere by collection on specially developed silver dichromate reagent films. For a 10-knot wind maximum concentration appeared to exist at 50 to 75 ft above Mean Low Water Springs, with the possibility of a second maximum somewhere above 300 ft. Preliminary size-frequency counts showed a bimodal

5003431

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distribution of salt nuclei with maximum at 5 and 12 microns. 16 references.

801. KEYWORD(S) BIKINI/meteorology ;BIKINI;AIR;WIND;CHEMICAL COMPOSITION;SODIUM CHLORIDES;ATMOSPHERE

Item 100

150. REPORT NUMBER XRD--150  
110. PRIMARY TITLE(M) Final report of atomic bomb tests. Appendix V. Report of commander task unit 1.4.1 (engineer). Vol. 2 of 7 Vol. [of] report of commander army ground group (task group 1.4). [Operation Crossroads]  
371. PUB. DATE(YMMDD) jdate  
34. CLASSIF. LEVEL TEXT Confidential  
950. ABSTRACT (See Vol. 1 and Vol. 3 through 7 as XRD-149 and XRD-151 through XRD-156 respectively). The object of the test was to determine the radii of damage to typical items of the Corps of Engineers Equipment and to discover weaknesses which might be corrected by improved design. Data were obtained and are presented on construction equipment, floating bridges, water supply equipment, mine detectors, electrical equipment, surveying equipment, fire fighting equipment, and infrared equipment. With the exception of searchlights and for infrared devices (Penrod), Corps of Engineer Equipment will probably withstand the effects of an air burst of the dimensions of Test A when exposed at a range of 1000 yd. Recommendations for improved design are presented.

801. KEYWORD(S) CROSSROADS/effects experiments ;BRIDGES/blast damage ;ARMY ENGINEER EQUIPMENT/blast damage ; CONSTRUCTION EQUIPMENT/blast damage ;CROSSROADS;BRIDGES

No data for number 2999 (item 101)

No data for number 2999 (item 101)

Item 102

150. REPORT NUMBER NRDL-TR--402  
110. PRIMARY TITLE(M) Taut-wire mooring for ocean anchoring  
70. PERSONAL AUTHOR(M) Egeberg, L.E.  
710. CORPORATE SOURCE Naval Radiological Defense Lab., San Francisco, CA (USA)  
371. PUB. DATE(YMMDD) 591211  
34. CLASSIF. LEVEL TEXT Unclassified  
950. ABSTRACT Twenty taut-wire moorings were designed and placed to hold instrument buoys for the deep underwater detonation, Shot Wahoo, of Operation HARDTACK. Water depths varied from 300 to 1000 fathoms and the majority of the moorings enjoyed no protection of the nearby atoll from open sea conditions. These conditions

5003432

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consisted of a 12 to 18-knot breeze and a short 3-ft chop from the northeast superimposed over a 300-ft long, 6 to 8 ft high swell from the east southeast. Each mooring consisted of a 1500-lb anchor connected by a 5/32-in., 1 x 19 galvanized steel cable to a 36 to 41-in. diameter buoy 150 ft below the surface. A floated 7/16-in. diameter nylon pennant 300 ft long connected this buoy to the surface instrumented buoy. Of the twenty moorings placed, 7 or 8 survived the effects of the event. One failed from collision with a vessel. Eleven failures resulted from undetermined effects of the detonation. The cause for ten of these was a tension break at the lower end of the cable; the cause for the eleventh could not be determined. The remaining mooring, which had no instrument buoy attached and was marked only by a spare subsurface buoy at the end of the nylon pennant, was never found. All but one cable failure was within 8000 ft of surface zero. However, the survival of two moorings at 4800 ft from surface zero indicates that the wire size chosen, though marginal, would have been satisfactory for open sea conditions alone. For the combined sea and detonation conditions that did prevail, an increase to 1/4 in. diameter cable for stations within 8000 ft of surface zero probably would have been sufficient to maintain all moorings. 4 references.

801. KEYWORD(S)

WAHOO BURST/instrumentation ;WIRES;INSTRUMENTATION;  
HARDTACK;MOORINGS;ANCHORS; FAILURES;BUOYS

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EDB Item 1

ANALYTIC TITLE ENGLISH A review of internal exposure accidents

ANALYTIC AUTHOR/AFFIL Nenot, J.C. [CEA Centre d'Etudes de Fontenay-aux-Roses,  
92 (France). Inst. de Protection et de Surete Nucleaire]

PAGE RANGE 265-277

PUB. DATE (YYMMDD) 930700

LIMITATION CODE UNL

ABSTRACT

The definition of an internal exposure accident is much more difficult to establish clearly than the one concerning external overexposures. For the latter, the notion is implicitly related to resulting health damage, while in most cases any internal contamination, regardless of its level and the upcoming or no of a detriment, is qualified as accidental. Therefore, this overview is limited to (1) large scale internal exposure accidents because large groups of individuals, highly contaminated or not, were involved; (2) occupational contaminations which sometimes resulted into long-term health effects, and (3) the results of the follow-up of patients who were either explored or treated in the 30s and 50s by alpha emitting radionuclides. Among large-scale accidents, mention is made of the 1954 american nuclear test in the Pacific ocean, uncorrectly programmed and responsible for thyroid diseases, of the 1957 accident in the Mayak complex in the Urals, of the Chernobyl nuclear reactor accident in 1986 and of the 1987 Goiania accident due to the uncontrolled dismantling of a teletherapy source. Among occupational contaminations, several medical and epidemiological follows-up are of particular interest, such as those concerning dial painters who used radium in the years 1910 and uranium miners, although it is difficult to qualify as accidental these practices, even if the doses received at this time were widely in excess of the limits in use nowadays. Taking into account the previous caution, the groups of patients who received relatively large amounts of thorotrast (used as contrast material) and of radium (considered as a large spectrum therapeutic agent) are very interesting as well; these two medical practices resulted into various long-term health effects, and were used, in some degree, to quantify the risk in man of alpha emitters. (author).

KEYWORDS

RADIATION ACCIDENTS/internal irradiation ;BRAZIL;  
CHERNOBYLSK-4 REACTOR;CONTAMINATION;DELAYED RADIATION  
EFFECTS;EPIDEMIOLOGY;HISTORICAL ASPECTS;HYPOTHYROIDISM;  
MARSHALL ISLANDS;OCCUPATIONAL DISEASES;OCCUPATIONAL

EXPOSURE; PLUTONIUM; PUBLIC HEALTH; RADIUM; RADON; RUSSIAN  
FEDERATION; THORIUM 232; THOROTRAST; WORKING CONDITIONS

EDB Item 2  
PRIMARY REPORT NUMBER UCRL-JC--115100  
TITLE ENGLISH A dose assessment for a U.S. nuclear test site --  
Bikini Atoll  
PERSONAL AUTHOR/AFFIL Robison, W.L.; Bogen, K.T.; Conrado, C.L.  
CORPORATE TEXT Lawrence Livermore National Lab., CA (United States)  
PUB. DATE (YYMMDD) 930700  
LIMITATION CODE UNL  
ABSTRACT On March 1, 1954, a nuclear weapon test, code-named  
BRAVO, conducted at Bikini Atoll in the northern  
Marshall Islands contaminated the major residence  
island. Here the authors provide a radiological dose  
assessment for the main residence island, Bikini, using  
extensive radionuclide concentration data derived from  
analysis of food crops, ground water, cistern water,  
fish and other marine species, animals, air, and soil  
collected at Bikini Island. The unique composition of  
coral soil greatly alters the relative contribution of  
cesium-137 and strontium-90 to the total estimated dose  
relative to expectations based on North American and  
European soils. Cesium-137 produces 96% of the estimated  
dose for returning residents, mostly through uptake from  
the soil to terrestrial food crops but also from  
external gamma exposure. The estimated maximum annual  
effective dose is  $4.4 \text{ mSv y}^{-1}$  when imported  
foods, which are now an established part of the diet,  
are available. The 30-, 50-, and 70-y integral effective  
doses are 10 cSv, 14 cSv, and 16 cSv, respectively. An  
analysis of interindividual variability in 0- to 30-y  
expected integral dose indicates that 95% of Bikini  
residents would have expected doses within a factor of  
3.4 above and 4.8 below the population-average value. A  
corresponding uncertainty analysis showed that after  
about 5 y of residence, the 95% confidence limits on  
population-average dose would be  $\pm 35\%$  of its expected  
value. The authors have evaluated various  
countermeasures to reduce  $^{137}\text{Cs}$  in food crops.  
Treatment with potassium reduces the uptake of  $^{137}\text{Cs}$   
into food crops, and therefore the ingestion dose,  
to less than 10% of pretreatment levels and has  
essentially no negative environmental consequences.

KEYWORDS BIKINI/fallout ; MAN/radiation doses ; FOOD  
CHAINS/contamination ; CESIUM 137/uptake ; STRONTIUM  
90/uptake ; BIKINI;FALLOUT;EXPERIMENTAL DATA;MAN;  
CONTAMINATION; UPTAKE

EDB Item 3  
PRIMARY REPORT NUMBER UCRL-ID--110051  
TITLE ENGLISH Possible differences in biological availability of isotopes of plutonium: Report of a workshop  
PERSONAL AUTHOR/AFFIL Kercher, J.R.; Gallegos, G.M. [eds.]  
CORPORATE TEXT Lawrence Livermore National Lab., CA (United States)  
PUB. DATE (YYMMDD) 930900  
LIMITATION CODE UNL  
ABSTRACT This paper presents the results of a workshop conducted on the apparent different bioavailability of isotopes {sup 238}Pu and {sup 239}Pu. There is a substantial body of evidence that {sup 238}Pu as commonly found in the environment is more biologically available than {sup 239}Pu. Studies of the Trinity Site, Nevada Test Site from nonnuclear and nuclear events, Rocky Flats, Enewetak and Bikini, and the arctic tundra support this conclusion and indicate that the bioavailability of {sup 238}Pu is more than an order of magnitude greater than that of {sup 239}Pu. Plant and soil studies from controlled environments and from Savannah River indicate no isotopic difference in availability of Pu to plants; whereas studies at the Trinity Site do suggest a difference. While it is possible that these observations can be explained by problems in the experimental procedure and analytical techniques, this possibility is remote given the ubiquitous nature of the observations. Studies of solubility of Pu in the stomach contents of cattle grazing at the Nevada Test Site and from fish from Bikini Atoll both found that {sup 238}Pu was more soluble than {sup 239}Pu. Studies of the Los Alamos effluent stream indicate that as particle size decreases, the content of {sup 238}Pu relative to {sup 239}Pu increases.  
KEYWORDS PLUTONIUM 238/biological availability ;PLUTONIUM 239/biological availability ;SOILS/contamination ;FOOD CHAINS/contamination ;SOILS;CONTAMINATION;PLANTS;FISHES; NEVADA TEST SITE;ENIWETOK;BIKINI;ARCTIC REGIONS;CATTLE; LOS ALAMOS

EDB Item 4  
ANALYTIC TITLE ENGLISH Adsorption and desorption kinetics of cesium in an organic matter-rich soil saturated with different cations  
ANALYTIC AUTHOR/AFFIL Aharoni, C. [Technion-Israel Inst. of Technology, Haifa (Israel)]; Pasricha, N.S. [Punjab Agricultural Univ., Ludhiana (India)]; Sparks, D.L. [Univ. of Delaware, Newark, DE (United States)]

PAGE RANGE 233-239  
PUB. DATE (YYMMDD) 931000  
LIMITATION CODE UNL  
ABSTRACT

The fallout from nuclear weapons tests conducted on Bikini Atoll Island in 1954 resulted in contamination of soil with Cesium 137. To develop effective regimes for decontaminating the Bikini Atoll soil, the exchange of Cs for K, Na, and other cations on the soil must be understood. Samples of soils made homoionic with K, Na, or Ca were reacted with solutions containing Cs ions, and the quantities of Cs sorbed and the rates of exchange were measured. The samples were then reacted with solutions containing K, Na, or Ca, and the quantities of Cs desorbed and the rates of exchange were again measured. Samples made homoionic with Na had a greater ion exchange capacity than samples made homoionic with K, and, in both cases, the ion exchange capacity increased with the organic matter content of the soil. For samples pretreated with Ca, the ion exchange capacity is not related in a simple way to the organic matter content. The kinetics were assessed by plotting the rate of exchange vs. the time and vs. the quantity exchanged. A first-order equation was obeyed during most of the run in Cs desorption experiments and during a limited part of the run in Cs adsorption experiments. An increase in the rate of Cs exchange was observed at the beginning of the experiments especially for Cs adsorption. This increase is presumably due to an increase of the ionic strength of the liquid phase during the exchange process. 33 refs., 9 figs., 2 tabs.

KEYWORDS CESIUM/chemical reaction kinetics ;CESIUM/ion exchange ; BIKINI/fallout ;BIKINI/land reclamation ;ADSORPTION; DESORPTION;CESIUM;ORGANIC MATTER;CATIONS;SOILS;NUCLEAR EXPLOSIONS;BIKINI;FALLOUT;POTASSIUM;SODIUM;CALCIUM

EDB Item 5

ANALYTIC TITLE ENGLISH On-site polychlorinated biphenyl destruction demonstration project on Kwaylein Atoll, Republic of the Marshall Islands

TITLE ENGLISH Air & Waste Management Association 85th annual meeting  
ANALYTIC AUTHOR/AFFIL Machanoff, R.; Donaldson, T.L.; Brown, C.H. [Martin Marietta Energy Systems, Oak Ridge, TN (United States)]

PAGE RANGE 43-44  
PUB. DATE (YYMMDD) 920000  
LIMITATION CODE UNL  
ABSTRACT

The Hazardous Waste Remedial Actions Program (HAZWRAP), managed by Martin Marietta Energy Systems, Inc., is providing environmental management support for the installation restoration of the U.S. Army Kwajalein



Atoll (USAKA) Base. The USAKA Base is located on Kwajalein Atoll, Republic of the Marshall Islands, which is over 2100 miles west of Hawaii in the southern North Pacific. HAZWRAP was tasked to devise a scheme for disposal of polychlorinated biphenyl (PCB)-contaminated transformer fluids. Alternatives to incineration were sought because of the remote location, harsh marine environment, and difficult logistics in transporting PCB-contaminated materials to the United States for disposal. Many of the transformers on Kwajalein Island contain askarels in the range of 300,000- to 700,000-ppm PCB. A survey of PCB disposal methods identified thermal destruction as the only available and permitted process for destroying very high-concentration PCB fluids. The economics and risk associated with transportation make this option unattractive. Existing chemical destructive methods are permitted for <10,000-ppm PCB and result in incomplete degradation of PCB. A new chemical method referred to as base catalyzed destruction (BCD) was developed by scientists at the Environmental Protection Agency Reduction Engineering Laboratory. The BCD chemical reaction will destroy PCBs in excess of 100,000 ppm. This emerging technology was not at the process or demonstration phase of development. HAZWRAP tasked scientists and engineers from Oak Ridge National Laboratory to develop and scale up the process. These efforts will result in a mobile chemical reactor unit that can be transported to remote locations and decontaminate high-concentration PCB fluids on-site.

KEYWORDS

MARSHALL ISLANDS/military facilities ;POLYCHLORINATED BIPHENYLS/in-situ processing ;WASTE MANAGEMENT; TRANSFORMERS;REMEDIAL ACTION;DECONTAMINATION;CHEMICAL REACTORS;MOBILE REACTORS

EDB Item 6

PRIMARY REPORT NUMBER  
TITLE ENGLISH

SAND--93-0218

Mission hazard assessment for STARS Mission 1 (M1) in the Marshall Islands area

PERSONAL AUTHOR/AFFIL  
CORPORATE TEXT  
PUB. DATE (YYMMDD)  
LIMITATION CODE  
ABSTRACT

Outka, D.E.; LaFarge, R.A.

Sandia National Labs., Albuquerque, NM (United States)  
930700

UNL

A mission hazard assessment has been performed for the Strategic Target System Mission 1 (known as STARS M1) for hazards due to potential debris impact in the Marshall Islands area. The work was performed at Sandia National Laboratories as a result of discussion with Kwajalein Missile Range (KMR) safety officers. The STARS

M1 rocket will be launched from the Kauai Test Facility (KTF), Hawaii, and deliver two payloads to within the viewing range of sensors located on the Kwajalein Atoll. The purpose of this work has been to estimate upper bounds for expected casualty rates and impact probability or the Marshall Islands areas which adjoin the STARS M1 instantaneous impact point (IIP) trace. This report documents the methodology and results of the analysis.

KEYWORDS

MISSILES/failures ;MISSILES/testing ;  
FAILURES/probabilistic estimation ;HUMAN  
POPULATIONS/health hazards ;MARSHALL ISLANDS;MISSILES;  
FAILURES;TESTING;ROCKETS;RISK ASSESSMENT;MISSILE  
LAUNCHING SITES;STATISTICAL MODELS;BALLISTIC MISSILE  
DEFENSE;TRAJECTORIES;RELIABILITY;NOZZLES

EDB Item 7

ANALYTIC TITLE ENGLISH Fall-out of military nuclear explosions: Marshall Islands, Utah and Nevada states  
TITLE ENGLISH The radioactive iodine irradiation  
ANALYTIC AUTHOR/AFFIL Galle, P. [Hopital Henri-Mondor, 94 - Creteil (France)]  
CORPORATE TEXT Electricite de France, 75 - Paris (France). Comite de Radioprotection  
PAGE RANGE 43-47  
PUB. DATE (YYMMDD) 920200  
LIMITATION CODE UNL  
ABSTRACT In this article, the author presents 1954 Bikini atoll accident and early and delayed effects on population: non thyroid and thyroid effects (hypothyroidism, nodules) in according to age, radiation doses. In conclusion, the most of late complications are induced by iodine radioisotopes. (5 tabs).

KEYWORDS

FALLOUT/nuclear explosions ;NUCLEAR EXPLOSIONS/delayed radiation effects ;NUCLEAR EXPLOSIONS/early radiation effects ;ACCIDENTS;BIKINI;DOSE RATES;EPIDEMIOLOGY; FALLOUT;FISSION PRODUCT RELEASE;HYPOTHYROIDISM;IODINE 131;IRRADIATION;NEOPLASMS;NEVADA;PUBLIC HEALTH;RADIATION DOSES;THYROID;UTAH

EDB Item 8

PRIMARY REPORT NUMBER MIC--92-07456/XAB  
TITLE ENGLISH Chernobyl radioactivity impacts and remediation of forest ecosystems  
PERSONAL AUTHOR/AFFIL Rennie, C.D.; Baweja, A.S.  
CORPORATE TEXT Environment Canada, Ottawa, ON (Canada)  
PUB. DATE (YYMMDD) 920000  
LIMITATION CODE UNL  
ABSTRACT This report gives an overview of the results of the

Chernobyl nuclear accident, the impacts of strontium, cesium, and plutonium on forestry ecosystems, the toxicity of the radionuclides, remediation techniques such as upgrading the soils with the addition of potassium and calcium, and other possible measures for remediation, based primarily on the Bikini Atoll model.

KEYWORDS

NUCLEAR POWER PLANTS/accidents ;FORESTS/radiation effects ;ACCIDENTS;FORESTS;REMEDIAL ACTION;STRONTIUM; CESIUM;PLUTONIUM;FORESTRY;TOXICITY;SOILS;POTASSIUM; CALCIUM;BIKINI

EDB Item 9

PRIMARY REPORT NUMBER MIC--92-07455/XAB

TITLE ENGLISH

Bibliography on Chernobyl radioactivity impacts and remediation of forest ecosystems

PERSONAL AUTHOR/AFFIL Rennie, C.D.; Baweja, A.S.

CORPORATE TEXT

Environment Canada, Ottawa, ON (Canada)

PUB. DATE (YYMMDD)

920000

LIMITATION CODE

UNL

ABSTRACT

Bibliography on the Chernobyl nuclear accident pertaining to radiological sources, distribution of radioactivity, transport of radionuclides in aquatic and terrestrial ecosystems, and biological impacts/indicators. The second section lists references on remediation technologies at Bikini Atoll Islands. References include books and periodicals from Canada, the United States, and European sources.

KEYWORDS

NUCLEAR POWER PLANTS/accidents ;RADIATION EFFECTS/bibliographies ;FORESTS/radiation effects ; ACCIDENTS;BIBLIOGRAPHIES;FORESTS;REMEDIAL ACTION; RADIOACTIVITY TRANSPORT;TERRESTRIAL ECOSYSTEMS;BIKINI; CANADA;ALLOCATIONS;EUROPE;USA;AQUATIC ECOSYSTEMS

EDB Item 10

ANALYTIC TITLE ENGLISH Clean soil at Eniwetok and Johnston Atolls

ANALYTIC AUTHOR/AFFIL Bramlitt, E.T.

PAGE RANGE

70-71

PUB. DATE (YYMMDD)

900000

LIMITATION CODE

UNL

ABSTRACT

The Defense Nuclear Agency has managed two large-scale soil cleanups (landmass decontaminations) of plutonium contamination. Both are at Pacific Ocean atolls formerly used for nuclear weapons tests. The Eniwetok Atoll (EA) cleanup between 1977 and 1980 evaluated 390 ha of contaminated land and cleaned 50 ha by removing 80,000 m<sup>3</sup> of contaminated soil. The Johnston Atoll (JA) cleanup is in process. It has checked 270 ha, will clean 15 ha, and plans for removal of 80,000 m<sup>3</sup> of soil.

The cleanups are similar in other respects including carbonate-based soil, in situ radiation surveys, contamination characteristics, soil excavation methods, safety, and weather. The two cleanups are in contrast relative to planning time, agencies involved, funding, documentation, environmental considerations, cleanup workforce, site beneficiaries, waste characterization, regulatory permits, management, and project duration. The most noteworthy differences are the rationale for cleanup, the cleanup process, the definition of clean, and the cost.

KEYWORDS

ENIWETOK/remedial action ;SOILS/decontamination ;  
ACTIVITY LEVELS;DOCUMENTATION;ENIWETOK;EXCAVATION;  
FINANCING;IN-SITU PROCESSING;METEOROLOGY;NUCLEAR  
EXPLOSIONS;NUCLEAR FACILITIES;NUCLEAR WEAPONS;PACIFIC  
OCEAN;PLANNING;PLUTONIUM;PROGRAM MANAGEMENT;RADIATION  
MONITORING;REGULATIONS;SAFETY;SITE CHARACTERIZATION;  
SOILS;DECONTAMINATION;SURVEILLANCE;TESTING;USA;VOLUME

EDB Item 11

PRIMARY REPORT NUMBER  
TITLE ENGLISH

BNL--46444(1992)  
Fallout: The experiences of a medical team in the care  
of a Marshallese population accidentally exposed to  
fallout radiation

PERSONAL AUTHOR/AFFIL  
CORPORATE TEXT  
PUB. DATE (YYMMDD)  
LIMITATION CODE  
ABSTRACT

Conard, R.A.  
Brookhaven National Lab., Upton, NY (United States)  
920900  
UNL

This report presents an historical account of the experiences of the Brookhaven Medical Team in the examination and treatment of the Marshallese people following their accidental exposure to radioactive fallout in 1954. This is the first time that a population has been heavily exposed to radioactive fallout, and even though this was a tragic mishap, the medical findings have provided valuable information for other accidents involving fallout such as the recent reactor accident at Chernobyl. Noteworthy has been the unexpected importance of radioactive iodine in the fallout in producing thyroid abnormalities.

KEYWORDS

MARSHALL ISLANDS/radiation accidents ;MEDICAL  
EXAMINATIONS/historical aspects ;HUMAN POPULATIONS;  
FALLOUT

EDB Item 12

ANALYTIC TITLE ENGLISH

Compensation for the victims of the Marshall Islands  
nuclear testing programme: the Marshall Islands Nuclear  
Claims Tribunal

TITLE ENGLISH Nuclear Inter Jura '91: nuclear law and nuclear energy  
for the future

SUBTITLE ENGLISH Proceedings of the biennial congress of the  
International Nuclear Law Association (AIDN-INLA), Bath,  
England, 23-26 September 1991

ANALYTIC AUTHOR/AFFIL Briscoe, W.

CORPORATE TEXT International Nuclear Law Association, Harwell (United  
Kingdom). British Administrative Committee

PAGE RANGE 367-386

PUB. DATE (YYMMDD) 920000

LIMITATION CODE UNL

ABSTRACT The Marshall Islands Nuclear Claims Tribunal was  
established in 1988 pursuant to legislation enacted by  
the Republic of the Marshall Islands as part of its  
obligations under the Compact of Free Association  
between it and the United States (ratified 1986) and an  
associated Compact implementation agreement. The  
Tribunal is generally considered to be the last hope for  
compensation for a large number of Marshallese who claim  
to have suffered injury or damage as a result of the  
United States Nuclear Testing Programme in the Marshall  
Islands, 1946 - 1958. Under the Compact, the United  
States admitted liability for injuries and damages  
suffered by Marshallese as a result of the Testing  
Programme and made provision for the payment of  
compensation. In return, the Republic agreed to espouse,  
on behalf of it and its citizens, all current and future  
claims for compensation against the United States. The  
Tribunal has been given a most challenging and unique  
assignment: - to identify and compensate the victims of  
the Testing Programme, with a potentially limited sum of  
money, an indefinite number of victims, and with  
cultural, environmental and political circumstances  
which are not altogether conducive to Western concepts  
associated with compensating people for damages and  
personal injuries suffered as a result of a wrongful  
act. The paper will describe the Tribunal's role in  
compensating the victims of the Testing Programme. It  
will highlight a number of legal, social and cultural  
difficulties in establishing and operating a scheme to  
compensate people for damages and injuries suffered or  
commenced up to forty years previously. (author).

KEYWORDS HARDTACK PROJECT/victims compensation ;HUMAN  
POPULATIONS/delayed radiation effects ;HUMAN  
POPULATIONS/marshall islands ;REDWING PROJECT/victims  
compensation ;LEGISLATION;LOCAL FALLOUT;NUCLEAR  
EXPLOSIONS;NUCLEAR INSURANCE;NUCLEAR LIABILITY;NUCLEAR  
WEAPONS;USA

EDB Item 13

ANALYTIC TITLE ENGLISH Late medical consequences of exposure to radioactive fallout

ANAL. SUBTITLE ENGLISH Rongelap and Utirik 35 years after 'BRAVO'

ANALYTIC AUTHOR/AFFIL Adams, W.H. [Brookhaven National Lab., Upton, NY (United States). Dept. of Medical]

PAGE RANGE 269-290

PUB. DATE (YYMMDD) 920100

LIMITATION CODE UNL

ABSTRACT Data collected by the Brookhaven Medical Program on the late medical consequences of the exposure to radioactive fallout originated from the detonation of a thermonuclear device on Bikini atoll in Marshall Islands are discussed. (author) 23 refs.; 6 figs.; 9 tabs.

KEYWORDS BRAVO EVENT/delayed radiation effects ;AGE GROUPS; EXPERIMENTAL DATA;FALLOUT;HEMATOLOGY;HUMAN POPULATIONS; MARSHALL ISLANDS;MEDICAL EXAMINATIONS;NEOPLASMS; RADIATION DOSES;SYMPTOMS;THYROIDITIS;TIME DEPENDENCE

EDB Item 14

PRIMARY REPORT NUMBER PB--92-216381/XAB

TITLE ENGLISH Definitional mission: Ocean Thermal Energy Conversion, Republic of the Marshall Islands. Export trade information

PERSONAL AUTHOR/AFFIL Dean, S.R.; Ross, J.M.

PUB. DATE (YYMMDD) 900900

LIMITATION CODE UNL

ABSTRACT The objective of the study was to determine the commercial viability of an Ocean Thermal Energy Conversion (OTEC) electric power plant at the Majuro Atoll in the Marshall Islands. It was concluded that various technology improvements and economic factors have converged to present a feasible opportunity. United States industrial and research organizations are technically capable of developing a commercial OTEC industry for domestic and export markets. It is estimated that 100% of OTEC equipment and services could be supplied by United States firms. However, Japan has aggressively pursued OTEC development with an apparent goal of dominating the export market.

KEYWORDS MARSHALL ISLANDS/ocean thermal power plants ;OCEAN THERMAL POWER PLANTS/marketing research ;TECHNOLOGY ASSESSMENT;COMPETITION;FINANCING;FEASIBILITY STUDIES; PLANNING;USA;JAPAN;TRADE;EXPORTS

EDB Item 15

ANALYTIC TITLE ENGLISH Bioremediation case study: Fuel-contaminated soil  
cleanup in the Marshall Islands

TITLE ENGLISH WATtec '92. Innovation in the 21st century: Excellence  
through continuous improvement

ANALYTIC AUTHOR/AFFIL Machanoff, R. [Martin Marietta Energy Systems, Inc.,  
Oak Ridge, TN (United States)]

PAGE RANGE 63

PUB. DATE (YYMMDD) 920000

LIMITATION CODE UNL

ABSTRACT Using microbes to degrade fuels in contaminated soils  
is becoming increasingly more attractive as an approach  
to environmental restoration. Removing contamination by  
traditional methods is costly, does not always eliminate  
the problem, and often just moves it somewhere else.  
Biodegradation of contaminants can often be accomplished  
in situ, resulting in the actual destruction of the  
contaminants by microbial conversion to harmless  
by-products. Bioremediation is not applicable to all  
forms of environmental contamination but has been  
demonstrated to be particularly effective on petroleum  
hydrocarbon based fuels. Bioremediation can offer a  
cost-effective means for site cleanup, particularly  
where challenging logistical considerations have to be  
factored into cleanup projects. Logistical  
considerations have made bioremediation the method of  
choice for the decontamination of fuel-containing soils  
on Kwajalein Island, Republic of the Marshall Islands.  
Kwajalein is located more than 2,100 miles west of  
Hawaii in the southernmost part of the North Pacific.  
The site of a major missile range of the Strategic  
Defense Command (SDC), Kwajalein has been the center of  
US defense activities for almost 50 years. The island is  
part of a typical coral atoll and is only 2.5 miles long  
and 0.5 miles wide. Mission-related activities over the  
past 5 decades have resulted in about 10% of the island  
being contaminated with diesel, gasoline, and jet fuels.  
SDC has executed an agreement with the Department of  
Energy for the Hazardous Waste Remedial Actions Program  
(HAZWRAP), a division of Martin Marietta Energy Systems,  
Inc., to assist the US Army Kwajalein Atoll (USAKA) in  
the management of the Base restoration activities on  
Kwajalein Atoll. HAZWRAP initiated sampling and  
feasibility studies to determine whether bioremediation  
was a viable choice for site cleanup at USAKA.

KEYWORDS HYDROCARBONS/biodegradation ;MARSHALL ISLANDS/land  
pollution ;SOILS/decontamination ;DIESEL FUELS;GASOLINE;  
HYDROCARBONS;BIODEGRADATION;JET ENGINE FUELS;  
MICROORGANISMS;REMEDIAL ACTION;SAMPLING;SOILS;  
DECONTAMINATION

EDB Item 16

PRIMARY REPORT NUMBER LA-UR--92-2514

TITLE ENGLISH High-speed photography of the first hydrogen-bomb explosion

PERSONAL AUTHOR/AFFIL Brixner, B.

CORPORATE TEXT Los Alamos National Lab., NM (United States)

PUB. DATE (YYMMDD) 920000

LIMITATION CODE UNL

ABSTRACT Obtaining detailed photographs of the early stages of the first hydrogen bomb explosion in 1952 posed a number of problems. First, it was necessary to invent a continuous-access camera which could solve the problem that existing million-picture-per-second cameras were blind most of the time. The solution here was to alter an existing camera design so that two modified cameras could be mounted around a single high-speed rotating mirror. A second problem, acquiring the necessary lenses of precisely specified focal lengths, was solved by obtaining a large number of production lenses from war surplus salvage. A third hurdle to be overcome was to test the new camera at an A-bomb explosion. Finally, it was necessary to solve the almost impossible difficulty of building a safe camera shelter close to a megaton explosion. This paper describes the way these problems were solved. Unfortunately the successful pictures that were taken are still classified.

KEYWORDS EXPLOSIONS/ultrahigh-speed photography ;EXPLOSIONS; HYDROGEN;MHZ RANGE 01-100;RADIATION PROTECTION;CAMERAS; ENIWETOK

EDB Item 17

ANALYTIC TITLE ENGLISH Office of the US Nuclear Waste Negotiator

ANALYTIC AUTHOR/AFFIL Leroy, D.H.

PAGE RANGE 152

PUB. DATE (YYMMDD) 911100

LIMITATION CODE UNL

ABSTRACT The Office of the US Nuclear Waste Negotiator was created as an independent federal agency by the US Congress pursuant to the 1987 amendments to the Nuclear Waste Policy Act of 1982. The office, which was authorized by Congress for 5 years following the enactment of the 1987 amendments, is headquartered in Boise, Idaho, and maintains a liaison office in Washington DC. The negotiator is charged with the responsibility of attempting to find a state or Indian tribe willing to host a repository or monitored retrievable storage (MRS) facility at a technically



qualified site on reasonable terms. The negotiator is instructed to negotiate with any state or Indian tribe that expresses an interest in hosting a repository or MRS facility. The negotiator will formally submit the negotiated agreement and environmental assessment to Congress, and the agreement will become effective when acted on by Congress and signed by the President into law.

KEYWORDS

RADIOACTIVE WASTE FACILITIES/site selection ;  
USA/radioactive waste management ;AMERICAN INDIANS;  
AMERICAN SAMOA;GUAM;HIGH-LEVEL RADIOACTIVE WASTES;IDAHO;  
MARIANA ISLANDS;MARSHALL ISLANDS;MONITORED RETRIEVABLE  
STORAGE;NUCLEAR WASTE POLICY ACTS;PUERTO RICO;STATE  
GOVERNMENT;TRUST TERRITORY OF THE PACIFIC ISLANDS;US DOE;  
USA;VIRGIN ISLANDS;WASHINGTON DC

EDB Item 18

PRIMARY REPORT NUMBER  
TITLE ENGLISH

UCRL-ID--104916

Estimates of the radiological dose to people living on  
Bikini Island for two weeks while diving in and around  
the sunken ships in Bikini Lagoon

PERSONAL AUTHOR/AFFIL  
CORPORATE TEXT  
PUB. DATE (YYMMDD)  
LIMITATION CODE  
ABSTRACT

Robison, W.L.

Lawrence Livermore National Lab., CA (United States)

900900

UNL

Bikini Island and Bikini Lagoon were contaminated by fallout from nuclear weapons tests conducted at the atoll by the United States from 1946 to 1958. The second test, Baker, of the Crossroads series was an underwater detonation in 1946 that sank several ships in the lagoon, including the USS Saratoga and the Japanese battleship Nagato. The ships received high-intensity gamma-ray and neutron bombardment from the Baker test, which induced radioactivity in the metal structures. Some of the tests conducted after the Baker shot (there were 21 tests in all) injected contaminated carbonate particles into the air, some of which were deposited across the lagoon surface. Most of this contaminated soil then settled onto the ships' decks and other structures and on the lagoon bottom. These sunken ships provide an interesting location for divers. Recreational diving and swimming in and around the ships raises the question of the potential radiological dose from the radionuclides present in or on the ships and in the lagoon sediments. The purpose of this paper, therefore, is to present an analysis of the potential radiological dose to persons who would dive near the sunken ships and live on Bikini Island for a short period of time.

KEYWORDS

BIKINI/fallout deposits ;SHIPS/underwater ;

SHIPS/radiation hazards ;FALLOUT DEPOSITS/sampling ;  
BIKINI;SHIPS;UNDERWATER;RADIATION DOSES;COBALT 60;CESIUM  
137;AMERICIUM 241;BISMUTH 207;EUROPIUM 155;SEDIMENTS;  
NUCLEAR EXPLOSIONS;SAMPLING;ACTIVITY LEVELS

EDB Item 19

PRIMARY REPORT NUMBER BNL--46444

TITLE ENGLISH Fallout: The experiences of a medical team in the care  
of a Marshallese population accidentally exposed to  
fallout radiation

PERSONAL AUTHOR/AFFIL Conard, R.A.

CORPORATE TEXT Brookhaven National Lab., Upton, NY (United States)

PUB. DATE (YYMMDD) 910000

LIMITATION CODE UNL

ABSTRACT This report presents an historical account of the  
experiences of the Brookhaven Medical team in the  
examination and treatment of the Marshallese people  
following their accidental exposure to radioactive  
fallout in 1954. This is the first time that a  
population has been heavily exposed to radioactive  
fallout, and even though this was a tragic mishap, the  
medical findings have provided valuable information for  
other accidents involving fallout such as the recent  
reactor accident at Chernobyl. Particularly important  
has been the unexpected importance of radioactive iodine  
in the fallout in producing thyroid abnormalities.

KEYWORDS HUMAN POPULATIONS/biological radiation effects ;  
MARSHALL ISLANDS;BRAVO EVENT;FALLOUT;NEOPLASMS

EDB Item 20

PRIMARY REPORT NUMBER BNL--45868-Rev.

TITLE ENGLISH Radiological dose assessments in the northern Marshall  
Islands (1989--1991)

SUBTITLE ENGLISH Revision

PERSONAL AUTHOR/AFFIL Sun, L.C.; Meinhold, C.B.; Moorthy, A.R.; Clinton, J.H.;  
Kaplan, E.

CORPORATE TEXT Brookhaven National Lab., Upton, NY (United States)

PUB. DATE (YYMMDD) 911100

LIMITATION CODE UNL

ABSTRACT The Republic of the Marshall Islands (RMI) is located  
in the central Pacific Ocean about 3500 km southwest of  
Hawaii and 4500 km east of Manila, Philippines. It  
consists of 34 atolls and 2 coral islands, having a  
total land area of about 180 km<sup>2</sup>, distributed over  
more than 2.5 {times} 10<sup>6</sup> of ocean. Between 1946  
and 1958 the United states conducted nuclear tests  
there: 43 at Enewetak and 23 at Bikini. Thirty-three  
years after the cessation of nuclear testing in the RMI,

the impact of these operations on the health and radiological safety of the people living in or planning to return to their contaminated homelands is still an important concern. The present Brookhaven National Laboratory (BNL) Marshall Islands Radiological Safety Program (MIRSP) began in 1987 with funding from the US Department of Energy (DOE). The objectives of the MIRSP are to determine the radionuclides present in the bodies of those people potentially exposed to residual radionuclide from weapon tests and fallout, and to assess their present and lifetime dose from external and internal sources. Field bioassay missions involving whole-body counting (WBC) and urine sample collection have, therefore, been important components of the program. WBC is used to measure {gamma}-emitters, such as <sup>40</sup>K, <sup>60</sup>Co and <sup>137</sup>Cs, present in individuals. Urine samples are used to measure {alpha} and {beta}-emitting nuclides such as <sup>239</sup>Pu and <sup>90</sup>Sr, that are undetectable by WBC routine methods.

KEYWORDS

MARSHALL ISLANDS/human populations ;HUMAN POPULATIONS/radiation doses ;BIOASSAY;URINE;POTASSIUM 40; COBALT 60;CESIUM 137;PLUTONIUM 239;STRONTIUM 90; QUALITATIVE CHEMICAL ANALYSIS;FALLOUT;NUCLEAR WEAPONS

EDB Item 21

PRIMARY REPORT NUMBER BNL--45868-Rev.12/91

TITLE ENGLISH Radiological dose assessments in the northern Marshall Islands (1989--1991)

SUBTITLE ENGLISH Revision

PERSONAL AUTHOR/AFFIL Sun, L.C.; Meinhold, C.B.; Moorthy, A.R.; Clinton, J.H.; Kaplan, E.

CORPORATE TEXT Brookhaven National Lab., Upton, NY (United States)

PUB. DATE (YYMMDD) 911200

LIMITATION CODE UNL

ABSTRACT The Republic of the Marshall Islands (RMI) is located in the central Pacific Ocean about 3500 km southeast of Hawaii and 4500 km east of Manila, Philippines. It consists of 34 atolls and 2 coral island, having a total land area of about 180 km<sup>2</sup>, distributed over more than 2.5 {times} 10<sup>6</sup> km<sup>2</sup> of ocean. Between 1946 and 1958 the United States conducted nuclear tests there: 43 at Enewetak and 23 at Bikini. Thirty-three years after the cessation of nuclear testing in the RMI, the impact of these operations on the health and radiological safety of the people living in or planing to return to their contaminated homelands is still an important concern. The present Brookhaven National Laboratory (BNL) Marshall Islands Radiological Safety

Program (MIRSP) began in 1987 with funding from the US Department of Energy (DOE). The objectives of the MIRSP are to determine the radionuclides present in the bodies of those people potentially exposed to residual radionuclide from weapon tests and fallout, and to assess their present and lifetime dose from external and internal sources. Field bioassay missions involving whole-body counting (WBC) and urine sample collection have, therefore, been important components of the program. WBC is used to measure {gamma}-emitters, such as {sup 40}K, {sup 60}Co and {sup 137}Cs, present in individuals. Urine samples are used to measure {alpha} and {beta}-emitting nuclides, such as {sup 239}Pu and {sup 90}Sr, that are undetectable by WBC routine methods. 6 refs.

KEYWORDS

MARSHALL ISLANDS/HUMAN POPULATIONS/radiation doses ; CESIUM 137/radiation detection ; PLUTONIUM 239/radiation detection ; WHOLE-BODY COUNTING; COBALT 60; POTASSIUM 40; STRONTIUM 90; RADIOACTIVITY; URINE

EDB Item 22

PRIMARY REPORT NUMBER BNL--45868

TITLE ENGLISH Radiological dose assessments in the northern Marshall Islands (1989--1991)

PERSONAL AUTHOR/AFFIL Sun, L.C.; Meinhold, C.B.; Moorthy, A.R.; Clinton, J.H.; Kaplan, E.

CORPORATE TEXT Brookhaven National Lab., Upton, NY (United States)

PUB. DATE (YYMMDD) 920000

LIMITATION CODE UNL

ABSTRACT

The present Brookhaven National Laboratory (BNL) Marshall Islands Radiological Safety Program (MIRSP) began in 1987 with funding from the US Department of Energy (DOE). The objectives of the MIRSP are to determine the radionuclides present in the bodies of those people potentially exposed to residual radionuclide from weapon tests and fallout, and to assess their present and lifetime dose from external and internal sources. Field bioassay missions involving whole body counting (WBC) and urine sample collection have, therefore, been important components of the program. WBC is used to measure {gamma}-emitters, such as {sup 40}K, {sup 60}Co and {sup 137}Cs, present in individuals. Urine samples are used to measure {alpha} and {beta}-emitting nuclides, such as {sup 239}Pu and {sup 90}Sr, that are undetectable by WBC routine methods.

KEYWORDS

MARSHALL ISLANDS/radiation monitoring ; HUMAN POPULATIONS/radiation doses ; RADIOECOLOGICAL CONCENTRATION; CESIUM 137; COBALT 60; POTASSIUM 40;

STRONTIUM 90;PLUTONIUM 239;URINE;RADIOISOTOPE SCANNING

EDB Item 23  
PRIMARY REPORT NUMBER PB--92-106244/XAB  
TITLE ENGLISH Sediment facies of Enewetak Atoll lagoon. Geologic and geophysical investigations of Enewetak Atoll, Republic of the Marshall Islands. Professional paper  
PERSONAL AUTHOR/AFFIL Wardlaw, B.R.; Henry, T.W.; Martin, W.E.  
CORPORATE TEXT Geological Survey, Alexandria, VA (United States)  
PUB. DATE (YYMMDD) 910000  
LIMITATION CODE UNL  
ABSTRACT Two sets of benthic (bottom-surface) samples were taken from the lagoon on Enewetak Atoll, Republic of the Marshall Islands, during the PEACE Program (1984-1985). These samples were collected to (1) familiarize project geologists with the distribution of sediment types and facies within Enewetak lagoon, (2) increase understanding of the distribution of modern microfaunas in the lagoon, and (3) supplement studies of the sea-floor features both within and near OAK and KOA craters. The benthic sample studies aided both evaluation of the stratigraphic sequence penetrated during the Drilling Phase and interpretation of the litho- and biostratigraphic framework used in analysis of OAK and KOA.  
KEYWORDS ENIWETOK/paleontology ;SEDIMENTS;BENTHOS;BATHYMETRY;STRATIGRAPHY;GEOLOGIC SURVEYS;GEOPHYSICS;SEDIMENTATION;FIELD TESTS;MARSHALL ISLANDS;SEA BED;COMPILED DATA;CRATERS;NUCLEAR EXPLOSIONS;SURFACE WATERS;ENIWETOK;PALEONTOLOGY

EDB Item 24  
PRIMARY REPORT NUMBER PB--92-100825/XAB  
TITLE ENGLISH Larger foraminifer biostratigraphy of PEACE boreholes, Enewetak Atoll, Western Pacific Ocean. Geologic and geophysical investigations of Enewetak Atoll, Republic of the Marshall Islands. Professional paper  
PERSONAL AUTHOR/AFFIL Gibson, T.G.; Margerum, R.  
CORPORATE TEXT Geological Survey, Alexandria, VA (United States)  
PUB. DATE (YYMMDD) 910000  
LIMITATION CODE UNL  
ABSTRACT Larger foraminiferal assemblages, including *Lepidocyclina orientalis*, *Miogypsina thecidæaeformis*, *Miogypsinoides dehaartii*, etc., and a smaller foraminifer, *Austrotrillina striata*, are used to correlate upper Oligocene and lower Miocene strata in the Pacific Atoll Exploration Program (PEACE) boreholes at Enewetak Atoll, Republic of the Marshall Islands,

western Pacific Ocean, with the Te and Tf zones of the previously established Tertiary Far East Letter Zonation. Correlation using these two benthic groups is critical because calcareous nannofossils and planktic foraminifers are absent in the lower Miocene strata. Biostratigraphic data from these boreholes delineate a thick (greater than 700 feet) sequence of upper Oligocene and lower Miocene strata corresponding to lower and upper Te zone. These strata document a major period of carbonate accumulation at Enewetak during the Late Oligocene and early Miocene (26 to 18 million years ago).

KEYWORDS

ENIWETOK/geologic formations ;GEOLOGIC FORMATIONS/paleontology ;STRATIGRAPHY;FORAMINIFERA; BOREHOLES;MARSHALL ISLANDS;THICKNESS;CARBONATES;ENIWETOK; TERTIARY PERIOD;CORRELATIONS;EXPLORATION;AGE ESTIMATION; PALEONTOLOGY;NUCLEAR EXPLOSIONS

EDB Item 25

ANALYTIC TITLE ENGLISH Comparative study of plutonium and americium bioaccumulation from two marine sediments contaminated in the natural environment

ANALYTIC AUTHOR/AFFIL Hamilton, T.F.; Smith, J.D. [Melbourne Univ., Parkville (Australia). Dept. of Inorganic Chemistry]; Fowler, S.W.; LaRosa, J.; Holm, E. [International Atomic Energy Agency, Monaco-Ville (Monaco). Lab. of Marine Radioactivity]; Aarkrog, A.; Dahlgaard, H. [Risoe National Lab., Roskilde (Denmark)]

PAGE RANGE 211-223

PUB. DATE (YYMMDD) 910000

LIMITATION CODE UNL

ABSTRACT

Plutonium and americium sediment-animal transfer was studied under controlled laboratory conditions by exposure of the benthic polychaete *Nereis diversicolor* (O. F. Mueller) to marine sediments contaminated by a nuclear bomb accident (near Thule, Greenland) and nuclear weapons testing (Enewetak Atoll). In both sediment regimes, the bioavailability of plutonium and <sup>241</sup>Am was low, with specific activity in the tissues <1% (dry wt) than in the sediments. Over the first three months, a slight preference in transfer of plutonium over <sup>241</sup>Am occurred and <sup>241</sup>Am uptake from the Thule sediment was enhanced compared to that from lagoon sediments of Enewetak Atoll. Autoradiography studies indicated the presence of hot particles of plutonium in the sediments. The results highlight the importance of purging animals of their gut contents in order to obtain accurate estimates of transuranic transfer from ingested sediments into

tissue. It is further suggested that enhanced transuranic uptake by some benthic species could arise from ingestion of highly activity particles and organic-rich detritus present in the sediments. (author).

KEYWORDS

AMERICIUM 241/annelids ;AMERICIUM 241/sediments ;  
AMERICIUM 241/uptake ;PLUTONIUM ISOTOPES/annelids ;  
PLUTONIUM ISOTOPES/sediments ;PLUTONIUM ISOTOPES/uptake ;  
ANNELIDS;SEDIMENTS;UPTAKE;AQUATIC ORGANISMS;  
CONTAMINATION;FALLOUT;GREENLAND;MARSHALL ISLANDS;NUCLEAR  
EXPLOSIONS;RADIONUCLIDE KINETICS

EDB Item 26

PRIMARY REPORT NUMBER

PB--91-239061/XAB

TITLE ENGLISH

Calcareous nannofossils and planktic foraminifers from Enewetak Atoll, Western Pacific Ocean: Geologic and geophysical investigations of Enewetak Atoll, Republic of the Marshall Islands. Professional paper

PERSONAL AUTHOR/AFFIL

Bybell, L.M.; Poore, R.Z.

CORPORATE TEXT

Geological Survey, Alexandria, VA (United States)

PUB. DATE (YYMMDD)

910000

LIMITATION CODE

UNL

ABSTRACT

Boring of the carbonate sequence at the northern end of Enewetak Atoll, Republic of the Marshall Islands, was conducted in 1985, as part of the Pacific Enewetak Atoll Crater Exploration (PEACE) Program. The overall goal of the program was to characterize physical effects of large-scale nuclear blasts, which were conducted in the early 1950's, on the sediments of the atoll. In the report the authors document the occurrences of stratigraphically diagnostic planktic microfossils in samples from Enewetak (generally referred to as core) and outline the rationale for incorporating all available diagnostic planktic assemblages into a composite sequence that was used to date the Enewetak benthic zonation.

KEYWORDS

ENIWETOK/geologic surveys ;NUCLEAR EXPLOSIONS/blast effects ;GEOPHYSICAL SURVEYS;SEDIMENTS;PACIFIC OCEAN; STRATIGRAPHY;CARBONATE ROCKS;MARSHALL ISLANDS;FOSSILS; FORAMINIFERA;ENIWETOK

EDB Item 27

PRIMARY REPORT NUMBER

ORNL/TM--11894

TITLE ENGLISH

Bioremediation demonstration on Kwajalein Island: Site characterization and on-site biotreatability studies

PERSONAL AUTHOR/AFFIL

Siegrist, R.L.; Korte, N.E.; Pickering, D.A. [Oak Ridge National Lab., TN (United States)]; Phelps, T.J. [Tennessee Univ., Knoxville, TN (United States)]

CORPORATE TEXT Oak Ridge National Lab., TN (United States)  
PUB. DATE (YYMMDD) 910900  
LIMITATION CODE UNL  
ABSTRACT An environmental study was conducted during February 1991 on Kwajalein Island, a US Army Kwajalein Atoll (USAKA) Base in the Republic of the Marshall Islands (RMI). This study was undertaken for the US Department of Energy (DOE) Hazardous Waste Remedial Actions Program (HAZWRAP) acting in behalf of USAKA. The purpose of the study was to determine if selected locations for new construction on Kwajalein Island were contaminated by petroleum hydrocarbons as suspected and, if so, whether bioremediation appeared to be a feasible technology for environmental restoration. Two different sites were evaluated: (1) the site planned freshwater production facility and (2) a site adjacent to an aboveground diesel fuel storage tank. Within the proposed construction zone for the freshwater production facility (a.k.a desalination plant), total petroleum hydrocarbons (TPH) were either absent or at low levels. Characterization data for another potential construction site adjacent to an aboveground diesel fuel storage tank southeast of the old diesel power plant revealed high concentrations of diesel fuel in the soil and groundwater beneath the site. Results of this investigation indicate that there are petroleum-contaminated soils on Kwajalein Island and bioremediation appears to be a viable environmental restoration technique. Further experimentation and field demonstration are required to determine the design and operating conditions that provide for optimum biodegradation and restoration of the petroleum-contaminated soils. 17 refs., 7 figs., 26 figs.

KEYWORDS DIESEL FUELS/biodegradation ;SUBSURFACE ENVIRONMENTS/pollution control ;MARSHALL ISLANDS; MILITARY FACILITIES;SITE CHARACTERIZATION;BIODEGRADATION; SOILS;MICROORGANISMS;ENVIRONMENTAL IMPACTS;GROUND WATER; FEASIBILITY STUDIES;HAZARDOUS MATERIALS;VOLATILE MATTER; WATER TABLES;STORAGE FACILITIES;LEAKS;BIOLOGICAL ADAPTATION;INFORMATION NEEDS;EXPERIMENT PLANNING

EDB Item 28  
ANALYTIC TITLE ENGLISH The impact of atmospheric aerosols on trace metal chemistry in open ocean surface seawater 3. Lead  
ANALYTIC AUTHOR/AFFIL Maring, H.B.; Duce, R.A. [Univ. of Rhode Island, Narragansett (United States)]  
PAGE RANGE 5341-5347  
PUB. DATE (YYMMDD) 900415



LIMITATION CODE  
ABSTRACT

UNL

Atmospheric aerosols collected at Enewetak Atoll in the tropical North Pacific were exposed to seawater in laboratory experiments to assess the impact of atmospheric aerosols on lead chemistry in surface seawater. The net atmospheric flux of soluble lead to the ocean is between 16 and 32 pmol cm<sup>{minus}2</sup>/yr at Enewetak. The stable lead isotopic composition of soluble aerosol lead indicates that it is of anthropogenic origin. Anthropogenic aerosol lead from Central and North America appears to be less soluble and/or to dissolve less rapidly than that from Asia. Dissolved organic matter and possibly lower pH appear to increase the nonaluminosilicate aerosol lead solubility and/or dissolution rate. The isotopic composition of lead in air, seawater and dry deposition suggests that after deposition in the ocean, nonaluminosilicate particulate lead can be reinjected into the atmosphere during sea salt aerosol production.

KEYWORDS

AEROSOLS/dissolution ; AEROSOLS/synthesis ;  
LEAD/environmental transport ; AEROSOLS; DISSOLUTION;  
SYNTHESIS; AIR; AIR POLLUTION; ALUMINIUM SILICATES; ASIA;  
BENCH-SCALE EXPERIMENTS; DEPOSITION; ENIWETOK; LEAD; LEAD  
ISOTOPES; ORGANIC MATTER; PACIFIC OCEAN; PARTICULATES; PH  
VALUE; POLLUTION SOURCES; SALTS; SEAWATER; SOLUBILITY; WATER  
CHEMISTRY

EDB Item 29

PRIMARY REPORT NUMBER

BNL--46439

TITLE ENGLISH

Whole-body counting in the Marshall Islands

SUBTITLE ENGLISH

1989--1991 Extended Abstract

PERSONAL AUTHOR/AFFIL

Sun, L.C.; Clinton, J.; Kaplan, E.; Meinhold, C.B.

CORPORATE TEXT

Brookhaven National Lab., Upton, NY (United States)

PUB. DATE (YYMMDD)

910000

LIMITATION CODE

UNL

ABSTRACT

In 1978 the Marshall Islands Radiological Safety Program was organized to perform radiation measurements and assess radiation doses for the people of the Bikini, Enewetak, Rongelap and Utirik Atolls. One of the major field components of this program is whole-body counting (WBC). WBC is used to monitor the quantity of gamma-emitting radionuclides present in individuals. A primary objective of the program was to establish <sup>137</sup>Cesium body contents among the Enewetak, Rongelap and Utirik populations. <sup>137</sup>Cs was the only gamma-emitting fission radionuclide detected in the 1,967 persons monitored. <sup>137</sup>Cs body burdens tended to increase with age for both sexes, and were higher in males. The average <sup>137</sup>Cs dose Annual Effective

Dose for the three populations was as follows: For Enewetak, the dose was  $22 \pm 4 \mu\text{Sv}$ . For Ujae, the dose was  $33 \pm 3 \mu\text{Sv}$ . Since 1985 the Rongelap people have been self-exiled to Mejjatto. Biological elimination should have reduced their dose to virtually zero, and the measured dose was  $2 \pm 2 \mu\text{Sv}$ . If they had remained on Rongelap Island, the calculated dose would have been  $99 \mu\text{Sv}$ , which is about one-third of the background dose. 7 refs., 1 tab. (MHB)

KEYWORDS

HUMAN POPULATIONS/radionuclide kinetics ; MARSHALL ISLANDS/; WHOLE-BODY COUNTING/data acquisition systems ; BODY BURDEN/age dependence ; BODY BURDEN/sex dependence ; CESIUM 137; STATISTICS; BIOASSAY; CALIBRATION; COBALT 60; PHANTOMS; RADIATION DOSES; ENVIRONMENTAL EXPOSURE; BIOLOGICAL HALF-LIFE; CONTAMINATION; CHRONIC EXPOSURE

EDB Item 30

PRIMARY REPORT NUMBER  
TITLE ENGLISH

DOE/SF/11634--T1

A guidebook to alternative energy projects on American Samoa, The Commonwealth of the Northern Mariana Islands, The Federated States of Micronesia, Guam, and The Republics of the Marshall Islands and Palau

PERSONAL AUTHOR/AFFIL  
CORPORATE TEXT

Case, C.W.

Golden Gate Energy Center, Sausalito, CA (United States); Xavier High School, Moen, Truk (Micronesia)

PUB. DATE (YYMMDD)

870500

LIMITATION CODE

UNL

ABSTRACT

The purpose of this guidebook is to help transfer information concerning alternative energy projects that have been tried on the Pacific islands affiliated with the US. These islands include those in American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia (Kosrae, Pohnpei, Truk, and Yap), Guam, and the Republics of the Marshall Islands and Palau. Distances are long between islands and populations are sparse, making communication and the transfer of information particularly difficult. A project that works on American Samoa might be appropriate for Yap, but to get this information to the proper people on Yap in a reasonable period of time is extremely difficult. This book describes 100 alternative energy projects that have been tried on the islands since the mid-1970's. This description and record of what has been done to date should be a source of ideas for energy workers, reduce duplication of work, and help encourage successes by describing other successes and failures. Alternative energy projects are projects that use indigenous, renewable resources in order to reduce local dependency on imported petroleum for electricity

or liquid fuels. The islands have an apparent abundance of natural resources for this purpose such as the sun, rivers, vegetation, the ocean, and wind; and, ideally, it should be relatively simple to convert these resources to electricity or fuel. However, there are problems unique to the remote, tropical Pacific that often appear insurmountable, and successes to date are the results of unusual persistence, hard work, and ingenuity of those on the islands. Projects are confined to those that actually develop or demonstrate hardware. These projects use the complete spectrum of alternative technologies such as biomass conversion, wind electric, solar water heating, photovoltaics, wind water pumping, hydroelectric, water desalination, and integrated systems. 381 refs., 85 figs.

KEYWORDS

SOLAR ENERGY/demonstration programs ;WIND  
TURBINES/demonstration programs ;RENEWABLE  
RESOURCES/demonstration programs ;HYDROELECTRIC  
POWER/demonstration programs ;BIOMASS/demonstration  
programs ;BIOGAS PROCESS/demonstration programs ;  
AMERICAN SAMOA;MARIANA ISLANDS;MICRONESIA;MARSHALL  
ISLANDS;GUAM;PALAU;TRUST TERRITORY OF THE PACIFIC  
ISLANDS;BIOMASS;SOLAR CELL ARRAYS;PHOTOVOLTAIC POWER  
SUPPLIES;SOLAR WATER HEATING;GRANTS;WIND POWER;  
WIND-POWERED PUMPS;BIOMASS PLANTATIONS;CHARCOAL

EDB Item 31

ANALYTIC TITLE ENGLISH Clinal morphological variation along a depth gradient  
in the living scleractinian reef coral *Favia pallida*:  
Effects on perceived evolutionary tempos in the fossil  
record

ANALYTIC AUTHOR/AFFIL Cuffey, R.J. [Pennsylvania State Univ., University Park  
(USA)]; Pachut, J.F. [Indiana Univ.-Purdue Univ.,  
Indianapolis (USA)]

PAGE RANGE 580-588

PUB. DATE (YYMMDD) 901200

LIMITATION CODE UNL

ABSTRACT

The Holocene reef-building coral *Favia pallida* was  
sampled at 4.5 m depth increments (to 40 m) from two  
reefs on Enewetak Atoll to examine intraspecific  
environmental effects. An exposed outer reef was massive  
and wall-like, whereas a sheltered lagoonal reef grew as  
a slender pinnacle. Corallite diameter and growth rate,  
two attributes retrievable in fossil corals, were  
measured with data partitioned into shallow (<20 m),  
intermediate (20 to 29 m), and deep-water (>29 m)  
subsets. Highly significant differences between depth  
zone populations were found for both corallite diameters  
and growth rates in analyses of individual and combined

reef data sets. Canonical variates analyses, (CVA) separated populations from depth zones along single, highly significant, functions. Centroids and 95% confidence intervals, calculated from CVA scores of colonies in each population, are widely separated for the lagoon reef and combined data sets. Conversely, populations from shallow and intermediate depths on the outer reef display overlapping confidence bars indicative of more gradational morphologic changes. When CV's were used to classify specimens to groups, misassignments of intermediate depth specimens to shallow or deep-water populations underscored the gradational nature of the environment. Completely intergrading populations of *Favia pallida* collected from different depths can be morphologically separated into statistically distinct groupings. A stratigraphic succession of such morphotypes might be interpreted as abruptly appearing separate species if sampling were not as uniform, systematic, and detailed as was possible on modern reefs. Analyses of evolutionary patterns must carefully assess potential effects of clinal variation if past evolutionary patterns are to be interpreted correctly.

KEYWORDS

COASTAL REGIONS/geomorphology ; CORALS/morphology ; ENIWETOK/coastal regions ; CLASSIFICATION; CLIMATES; GEOMORPHOLOGY; CORALS; MORPHOLOGY; CORRELATIONS; DEPTH; ENIWETOK; ENVIRONMENTAL EFFECTS; GEOLOGIC HISTORY; QUATERNARY PERIOD; REEFS; SAMPLING; STRATIGRAPHY; VARIATIONS

EDB Item 32

ANALYTIC TITLE ENGLISH Introduction: Enewetak Atoll and the PEACE program

ANALYTIC AUTHOR/AFFIL Henry, T.W.; Wardlaw, B.R.

PAGE RANGE A1-A29

PUB. DATE (YYMMDD) 900000

LIMITATION CODE UNL

ABSTRACT

An extensive study was made from June 1984 through August 1985 of the surface and subsurface configurations of two large nuclear craters on the northern side of Enewetak Atoll, Republic of the Marshall Islands. These craters, KOA and OAK, resulted from the near-surface detonation of two high-yield thermonuclear devices in 1958, when the atoll was part of the Pacific Proving Grounds. This multidisciplinary study was designed to produce a broad well-documented geologic, geophysical, and materials-properties data base for use in answering critical questions concerning craters formed by high-yield bursts. The study was part of a larger research initiative by the US Department of Defense to better understand high-yield, strategic-scale nuclear

bursts and how Pacific Proving Grounds craters relate to the basing and targeting of nuclear-weapon systems and related national defense issues. The data gathered during the study of the Enewetak craters are applicable to many scientific topics well beyond cratering mechanics and other related strategic concerns of the US DOD. These scientific topics include the geologic evolution of the Pacific Basin, the biologic and geologic history of a coral atoll, the fluctuation of sea level in response to glaciation and deglaciation, the diagenetic history of carbonate rocks in relation to sea-level changes and the differing substrate-water geochemistries thus produced, the speciation and migration of marine biotas, and the biostratigraphic succession of biotas through time and the calibration of these events with an absolute isotopic time scale, to name a few.

KEYWORDS

CRATERS/geologic surveys ;CRATERS/geophysical surveys ; ENIWETOK/craters ;BLAST EFFECTS;CALIBRATION;CARBONATE ROCKS;CRATERING EXPLOSIONS;CRATERS;DIAGENESIS;ENIWETOK; ENVIRONMENTAL TRANSPORT;FLUCTUATIONS;GEOCHEMISTRY; GEOLOGIC HISTORY;GLACIERS;NUCLEAR WEAPONS;PALEONTOLOGY; ROCK MECHANICS;SEA LEVEL;STRATIGRAPHY;THERMONUCLEAR EXPLOSIONS;US DOD

EDB Item 33

ANALYTIC TITLE ENGLISH Investigation of radioactivities on the wood samples taken from a fishing boat, the 5th Sumiyoshimaru  
ANALYTIC AUTHOR/AFFIL Shizuma, Kiyoshi; Iwatani, Kazuo; Hasai, Hiromi [Hiroshima Univ., Higashi-Hiroshima (Japan). Faculty of Engineering]

PAGE RANGE 159-164

PUB. DATE (YYMMDD) 910300

LIMITATION CODE UNL

ABSTRACT Radioactivity survey has been performed on samples taken from a fishing boat, the 5th Sumiyoshimaru. This boat has been presumed to be exposed to the fallout of Bikini hydrogen bomb test. Gamma-ray measurements have been carried out for six wood samples and two soil samples. Since the {sup 137}Cs concentration estimated for all samples were comparable to the fallout of the nuclear test, it was hard to judge whether the boat was definitely exposed to the Bikini fallout. (author).

KEYWORDS

NUCLEAR EXPLOSIONS/fallout ;FALLOUT/bikini ;RADIATION DOSES;FALLOUT;BIKINI;GAMMA SPECTROSCOPY;SHIPS;WOOD;SOILS; RADIOACTIVITY;CESIUM 137;AMERICIUM 241;COBALT 60; EUROPIUM 155;SAMPLING

EDB Item 34  
PRIMARY REPORT NUMBER UCRL-ID--105719-Rev.1  
TITLE ENGLISH Bikini, Enewetak, and Rongelap Marshallese, and United States nuclear weapons testing in the Marshall Islands:  
A bibliography  
SUBTITLE ENGLISH Revision 1  
PERSONAL AUTHOR/AFFIL Schultz, V. [Washington State Univ., Pullman, WA (USA)]; Schultz, S.C. [Oregon Univ., Eugene, OR (USA)]; Robison, W.L. [ed.] [Lawrence Livermore National Lab., CA (USA)]  
CORPORATE TEXT Lawrence Livermore National Lab., CA (USA)  
PUB. DATE (YYMMDD) 910500  
LIMITATION CODE UNL  
ABSTRACT A considerable literature exists on the Bikini, Enewetak, and Rongelap Marshallese and their atolls; however, this literature consists of a large number of governmental documents that are relatively unknown and difficult to locate. This is particularly true of the documents of the Trust Territory of the Pacific Islands and those related to nuclear weapons testing in the Marshall Islands. Because a comprehensive bibliography on the impact of nuclear weapons testing on the Marshallese and their atolls does not exist, the preparation of a bibliography that includes sufficient information to locate all types of reports seems justified. This document is the bibliography.  
KEYWORDS NUCLEAR EXPLOSIVES;/BIBLIOGRAPHIES;BIKINI;MARSHALL ISLANDS;ENIWETOK

EDB Item 35  
PRIMARY REPORT NUMBER AD-A--230631/4/XAB  
TITLE ENGLISH Modelling and observations of the equatorial ionosphere. Rept. for 1 Oct 87-30 Sep 88  
PERSONAL AUTHOR/AFFIL Mendillo, M.  
CORPORATE TEXT Boston Univ., MA (USA). Center for Space Physics  
PUB. DATE (YYMMDD) 901010  
LIMITATION CODE UNL  
ABSTRACT The equatorial ionosphere experiences one of the most severe forms of a geophysical plasma instability - a phenomenon known as spread F. An observational campaign was organized to bring a complement of diagnostic instruments to two sites in the western Pacific sector (Kwajalein Atoll in the Marshall Islands and Wake Island) for a period of coordinated optical and radio measurements of spread F phenomena in August 1988. All-sky optical imaging observations were conducted from 2-16 August in conjunction with ALTAIR radar observations on Kwajalein. Preliminary review of the

data sets obtained identified at least five case study events for detailed investigation.

KEYWORDS

SPREAD F/monitoring ;GEOPHYSICS;INCOHERENT SCATTERING; IONOSPHERE;ISLANDS;MARSHALL ISLANDS;PACIFIC OCEAN;RADAR; MONITORING;PLASMA;PLASMA INSTABILITY;VISIBLE RADIATION; RADIOWAVE RADIATION;IMAGES;DATA

EDB Item 36

PRIMARY REPORT NUMBER DOE/NV--209-Rev.11

TITLE ENGLISH Announced United States nuclear tests, July 1945--December 1990

SUBTITLE ENGLISH Revision 11

CORPORATE TEXT USDOE Nevada Operations Office, Las Vegas, NV (USA). Office of External Affairs

PUB. DATE (YYMMDD) 910100

LIMITATION CODE UNL

ABSTRACT

This document lists chronologically and alphabetically by event name all nuclear tests conducted and announced by the United States from July 1945 to December 1990 with the exception of the GMX experiments. Discussion is included on test dates, test series, test yields, test locations, test types and purposes, test totals for Nevada Test Site (NTS) detection of radioactivity from NTS events, and categorization of NTS nuclear tests. Briefly discussed are agreements between the US and the Soviet Union regarding test banning. (MB)

KEYWORDS

USA/nuclear explosions ;NUCLEAR EXPLOSIONS/historical aspects ;USA;NUCLEAR WEAPONS;NEVADA TEST SITE;NATIONAL DEFENSE;UNDERGROUND EXPLOSIONS;DETONATIONS;US DOE;LANL; SANDIA LABORATORIES;US AEC;US ERDA;NOUGAT OPERATION; DOMINIC PROJECT;CROSSROADS PROJECT;ATMOSPHERIC EXPLOSIONS;UNITED KINGDOM;JAPAN;PACIFIC OCEAN;ANVIL PROJECT;ATLANTIC OCEAN;MARSHALL ISLANDS;ALEUTIAN ISLANDS; SANDSTONE PROJECT;RANGER PROJECT;GREENHOUSE PROJECT; JANGLE PROJECT;TUMBLER PROJECT;IVY PROJECT;UPSHOT PROJECT;CASTLE PROJECT;TEAPOT PROJECT;REDWING PROJECT; PLUMBBOB PROJECT;HARDTACK PROJECT;ARGUS EVENT;CROSSTIE OPERATION;BOWLINE OPERATION;MANDREL OPERATION;EMERY OPERATION;GROMMET OPERATION;TOGGLE OPERATION;ARBOR PROJECT;BEDROCK PROJECT;FULCRUM OPERATION;PRAETORIAN PROJECT;FUSILEER OPERATION;PLOWSHARE PROJECT

EDB Item 37

ANALYTIC TITLE ENGLISH Contemporary distributions of Cs-137 in Marshall Islands soils

TITLE ENGLISH The 1989 international chemical congress of Pacific Basin Societies: Abstracts of papers, Parts I and II

ANALYTIC AUTHOR/AFFIL Hamilton, T.; Rosenstock, L. [Univ. of Washington,

Seattle (USA)]; Greenhouse, N.A.  
PAGE RANGE 716-717, Paper INOR 717  
PUB. DATE (YYMMDD) 890000  
ABSTRACT Atmospheric tests of nuclear weapons ranging from tens of kT to 15 MT of TNT were conducted by the United States at two sites in the northern Marshall Islands. The test areas are now parts of the Republic of the Marshall Islands. Resolutions of health related problems or property damage resulting from the weapons tests were assumed by a Nuclear Claims Tribunal which was funded for this purpose. This paper describes the results of a survey conducted in 1988 which was designed to determine whether a potential connection exists between local fallout and the incidence of radiogenic disease among Marshallese residents of islands in the greater vicinity of the two test areas. Soil samples were collected from two southern atolls as controls, and from five northern sites to look for higher cesium-137 levels which may have been contributed by tropospheric fallout from the weapons tests.

KEYWORDS CESIUM 137/ecological concentration ;MARSHALL ISLANDS/soil chemistry ;BIOLOGICAL RADIATION EFFECTS; HEALTH HAZARDS;LOCAL FALLOUT;NUCLEAR WEAPONS;PERFORMANCE TESTING

EDB Item 38  
ANALYTIC TITLE ENGLISH Overview of the radiological accidents in the world, updated December 1989  
ANALYTIC AUTHOR/AFFIL Nenot, J.C. [CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Protection Sanitaire]  
PAGE RANGE 1073-1085  
PUB. DATE (YYMMDD) 900600  
LIMITATION CODE UNL  
ABSTRACT This outline historical review discusses radiological accidents of two categories: those involving large groups of the population with relatively low doses, or a few individuals with high doses resulting in acute health effects. Comments on the following accidents are made: (a) the Marshallese population and the Japanese Fisherman, Pacific Ocean 1954 (b) South East Urals USSR 1957 (c) Juarez, Mexico 1983/84 (d) Chernobyl 1986 (e) Goiania, Brazil 1987. Registration of accidents resulting in high doses to few individuals is also discussed:-criticality accidents, those resulting in high whole-body doses from sealed sources, nuclear power reactor incidents leading to acute doses among workers, those resulting in localized radiation injury and those resulting in severe internal exposure. (UK).



KEYWORDS RADIATION ACCIDENTS/reviews ; REACTOR ACCIDENTS/reviews ;  
BRAZIL; CHERNOBYLSK-4 REACTOR; MARSHALL ISLANDS; PACIFIC  
OCEAN; REVIEWS; RADIOLOGICAL PERSONNEL; REACTOR OPERATORS;  
SEALED SOURCES; THREE MILE ISLAND-2 REACTOR; USA; USSR;  
WINDSCALE PRODUCTION REACTORS

EDB Item 39

ANALYTIC TITLE ENGLISH Radiation hazards and victims: a bitter legacy

ANALYTIC AUTHOR/AFFIL Ruff, T. [Monash Univ., Clayton (Australia)]

PAGE RANGE 20-23

PUB. DATE (YYMMDD) 890500

LIMITATION CODE UNL

ABSTRACT The problems of contamination as a result of exposure  
to ionizing radiation, whether human or natural in  
origin are reviewed. It is revealed that cancer is still  
on the increase in the exposed population from the  
Hiroshima and Nagasaki bombings, with genetic defects and  
chromosomal aberrations higher than thought. The effect  
of radiation fallout from the nuclear weapon tests in  
the Pacific and USA are also discussed and it is  
concluded that nuclear arsenals and the very existence  
of nuclear facilities containing large inventories of  
long-lived radionuclides constitute a major threat to  
the health of humankind, even if nuclear war never  
occurs.

KEYWORDS NUCLEAR EXPLOSIONS/biological radiation effects ;  
NUCLEAR EXPLOSIONS/human populations ; AUSTRALIA;  
ENVIRONMENTAL IMPACTS; FALLOUT; FRANCE; HEALTH HAZARDS;  
HIROSHIMA; IONIZING RADIATIONS; MARSHALL ISLANDS; NAGASAKI;  
NUCLEAR WEAPONS; PUBLIC OPINION; RADIATION DOSES; UNITED  
KINGDOM; USA; USSR

EDB Item 40

ANALYTIC TITLE ENGLISH Uncertainties in estimating dose-effects relationships  
under emergency (Hiroshima, Nagasaki 1945, Bikini 1954)

TITLE ENGLISH Proceedings of the 15. Berzelius symposium on somatic  
and genetic effects of ionizing radiation

ANALYTIC AUTHOR/AFFIL Nishiwaki, Y. [IAEA, Vienna (Australia). Div of Nuclear  
Safety]

PERSONAL AUTHOR/AFFIL Stigbrand, T. [ed.]

PAGE RANGE 167-176

PUB. DATE (YYMMDD) 890000

LIMITATION CODE UNL

ABSTRACT There are many types of uncertainties involved in the  
estimation of risks or dose-effect relationships under  
emergency conditions. However, they may be divided into  
two major categories: uncertainty due to randomness and  
that due to fuzziness. The conventional methods of

treating uncertainty are to apply statistical methods of estimation, which are, in turn, based upon the concept of probability. Even in cases where the source of uncertainty is of non-statistical nature, formal application of statistical methods of analysis is often made to deal quantitatively with uncertainty, tacitly accepting the premise that uncertainty - whatever its nature - can be equated with randomness. Most of the work on risk analysis or risk assessment has been done using such methods. In the fuzzy set concept set uncertainties are accepted as uncertain with the introduction of the membership function. Instead of the non-fuzzy two-valued logic 'true or false' any intermediate value between zero (false) and one (true) can be assumed for the membership function in the fuzzy set theory. Use of the fuzzy set theory is proposed in an attempt to analyse the causal relation between dose and effects under emergency conditions. After the atomic bombings in Hiroshima and Nagasaki and the Bikini Accident many efforts have been made to estimate the dose of survivors. However, because of various uncertainties involved in this type of estimation under the emergency conditions, the accurate estimation of the individual dose is very difficult. It was recently reported that ESR dosimetry could be applied to estimate the radiation doses of the individual using the enamel of the teeth of the survivors or material such as shell-button, sugar etc. found on the person. (author).

KEYWORDS

DOSE-RESPONSE RELATIONSHIPS/probabilistic estimation ;  
BIKINI;HIROSHIMA;NAGASAKI;RISK ASSESSMENT

EDB Item 41

ANALYTIC TITLE ENGLISH Clean-up of a radioactive spill

ANAL. SUBTITLE ENGLISH Soil chemistry and the lessons of Bikini Atoll

TITLE ENGLISH Proceedings of the 1987 Pacific Northwest metals and minerals conference (abstracts)

SUBTITLE ENGLISH Modern mineral and metal technology

ANALYTIC AUTHOR/AFFIL Fish, W. [Oregon Graduate Center, Beaverton, OR (US)]

PAGE RANGE 33

PUB. DATE (YYMMDD) 870000

LIMITATION CODE UNL

ABSTRACT Bikini Atoll in the Marshall Islands of the South Pacific was extensively contaminated with radionuclides deposited by thermonuclear weapons testing in the 1940s and 1950s. In recent years, the U.S. government has attempted to restore the habitability of the islands by cleaning up the remaining radioactive material. Although the island no longer presents an acute radiation risk to inhabitants, plants growing on the island concentrate

cesium-137 from the soil, presenting an unacceptable risk to the future population. The behavior of Cs-137 has proved to be an intractable problem that has major implications for the risks associated with transporting and processing high-level nuclear wastes in the U.S. Various proposed soil treatment strategies for Bikini are discussed, including ion-exchange treatments and competing-ion strategies. No fully satisfactory treatment currently exists and the problems and prospects of cleaning up after a major nuclear waste spill are presented.

KEYWORDS

SOILS/decontamination ; CESIUM 137/removal ;  
BIKINI/radiation hazards ; SOILS; DECONTAMINATION; REMOVAL;  
RADIOECOLOGICAL CONCENTRATION; RADIONUCLIDE MIGRATION;  
BIKINI

EDB Item 42

ANALYTIC TITLE ENGLISH Agronomic behavior of phosphoric rock from Bahia Inglesa using isotopic techniques. 2. Greenhouse experiment in three volcanic ash soils

ANALYTIC AUTHOR/AFFIL Pino N, I.; Casas G, L. [Comision Chilena de Energia Nuclear, Santiago (Chile)]

PAGE RANGE 37-40

PUB. DATE (YYMMDD) 890400

LIMITATION CODE UNL

ABSTRACT

With the aim to evaluate the behaviour of phosphoric rock in regard to the sorption capacity from three volcanic ash soils, a greenhouse trial was carried out. The isotopic dilution method with triple superphosphate labeled P32 (TSP-32) was used. Total dry matter, P total was determined by colorimetry and the liquid scintillation method for P32 was used. The evaluation of the rock was measured through different isotopical parameters such as A value and P derived from the rock. The behaviour of this material was affected by the different properties of the soils mainly on account of the diverse sorption capacity of them giving an inverse relation among sorption and effectiveness of the rock. The results showed a higher efficiency of TSP for the three soils compared with the phosphoric rock either concentrated or not. (author).

KEYWORDS

PHOSPHORUS 32/labelled compounds ; PHOSPHORUS  
32/radionuclide migration ; PHOSPHORUS 32/soils ;  
SOILS/greenhouse project ; SOILS/isotope dilution ;  
SOILS/superphosphates ; ABSORPTION SPECTROSCOPY;  
ADSORPTION; CHILE; IGNEOUS ROCKS; LIQUID SCINTILLATION  
DETECTORS; SOILS; SUPERPHOSPHATES

EDB Item 43

PRIMARY REPORT NUMBER LA--11728-C

ANALYTIC TITLE ENGLISH Mission to planet Earth

TITLE ENGLISH Proceedings of the conference on technology-based  
confidence building: Energy and environment

ANALYTIC AUTHOR/AFFIL McLucas, J.L.

PERSONAL AUTHOR/AFFIL Allred, J.C.; Eckhardt, R.C.; Nichols, A.S. [eds.]

CORPORATE TEXT Los Alamos National Lab., NM (USA)

PAGE RANGE 266-274

PUB. DATE (YYMMDD) 891100

ABSTRACT National leaders are taking notice of the importance of the topic, and it is the subject of discussion at meetings of heads of state. Whereas only a few years ago, most people were not concerned about the environment, recent public opinions show that 3/4 of the people in the US regard it as a primary concern that demands more attention than it is getting. Many have gone even farther in their thinking, to the point that they think we are in a serious environmental crisis. It is possible that the air of crisis is doing us a favor. It presents the people of all the Earth with the threat of a common danger. It is usually easier to elicit people's cooperation in facing a common danger than it is to get them to cooperate on some worthy but altruistic purpose. Because of the threat, there is a surprising degree of consensus that the problem is real, that we must change not only our ways of behaving but our ways of thinking about our world. There is also a feeling that we used both new policies and new leadership from the top to deal adequately with what faces us. All of this leads me to consider how we can use our space assets to improve our knowledge and equip us to deal with the environmental challenge. Mission to Planet Earth refers to a continuing study of the Earth from space. One of the principal points of this paper is that space is the place to gather most of the data we need to understand the Earth for the first time in all its beauty, glory, and increasingly recognized vulnerability.

KEYWORDS RESOURCE MANAGEMENT/environmental effects ;USA/resource management ;DATA ACQUISITION;DATA COMPILATION; DEFORESTATION;DEVELOPING COUNTRIES;ECOLOGY;GREENHOUSE PROJECT;HUMAN POPULATIONS;NASA;NATIONAL SCIENCE FOUNDATION;RESOURCE DEPLETION;SATELLITES;SOIL CONSERVATION;US DOE;US EPA;US NOAA;USA

EDB Item 44

PRIMARY REPORT NUMBER AD-A--214150/5/XAB

TITLE ENGLISH Kiernan reentry measurements system on Kwajalein atoll  
PERSONAL AUTHOR/AFFIL Roth, K.R.; Austin, M.E.; Frediani, D.J.; Knittel, G.H.;  
Mrstik, A.V.  
CORPORATE TEXT Massachusetts Inst. of Tech., Lexington, MA (USA).  
Lincoln Lab.  
PUB. DATE (YYMMDD) 890000  
LIMITATION CODE UNL  
ABSTRACT The Kiernan Reentry Measurements System (KREMS),  
located on Kwajalein Atoll in the Pacific, is the United  
States' most sophisticated and important research and  
development radar site. Consisting of four one-of-a-kind  
instrumentation radars, KREMS has played a major role  
for the past 25 years in the collection of data  
associated with ICBM testing. Furthermore, it has served  
as an important space-surveillance facility that  
provides an early U.S. view of many Soviet and Chinese  
satellite launches. Finally, the system is slated to  
play a key role in Strategic Defense Initiative  
experiments.

KEYWORDS RADAR;/MISSILES/test facilities ;BALLISTIC MISSILE  
DEFENSE/test facilities ;SATELLITES;DATA ACQUISITION;  
RADAR;REENTRY VEHICLES;SURVEILLANCE;MISSILES;MARSHALL  
ISLANDS

EDB Item 45  
PRIMARY REPORT NUMBER AD-A--214139/8/XAB  
TITLE ENGLISH Proposed actions at US Army Kwajalein atoll. Final  
environmental impact statement (FEIS)  
CORPORATE TEXT Army Strategic Defense Command, Huntsville, AL (USA)  
PUB. DATE (YYMMDD) 891000  
LIMITATION CODE UNL  
ABSTRACT The purpose of the Proposed Action is to conduct tests  
and collect data in support of continuing research,  
development, and operational missions; operational space  
track missions; and Strategic Defense Initiative  
research, development, test, and evaluation activities.  
Three alternatives are considered in the Environmental  
Impact Statement (EIS). The No-Action Alternative  
includes the ongoing activities at USAKA. The Proposed  
Action includes installation and testing of SDI  
sensing/tracking equipment and interceptor missile  
systems. Four construction projects in support of base  
operators are also included. Finally, the EIS examines a  
Change of Duration Alternative that implement as the  
Proposed Action over a longer period of time. The EIS  
examines the environmental impacts of each alternative.  
Where impacts were found to be potentially significant,  
mitigation measures are identified. Key topics addressed  
by the EIS include land and reef areas, water resources,

air quality, noise, biological resources including endangered species, cultural resources, socioeconomics, transportation, utilities, electromagnetic radiation from radars, and range safety.

KEYWORDS

SPACE WEAPONS/test facilities ;BALLISTIC MISSILE DEFENSE/space weapons ;TEST FACILITIES/environmental impact statements ;MISSILES/test facilities ;AIR QUALITY; CONSTRUCTION;DATA ACQUISITION;ECONOMIC IMPACT; ELECTROMAGNETIC RADIATION;ENDANGERED SPECIES;MARSHALL ISLANDS;NOISE;SURVEILLANCE;WATER RESOURCES;MISSILES

EDB Item 46

PRIMARY REPORT NUMBER

AD-A--209676/6/XAB

TITLE ENGLISH

Draft environmental impact statement. Proposed actions at US Army Kwajalein Atoll

CORPORATE TEXT

Army Strategic Defense Command, Huntsville, AL (USA)

PUB. DATE (YYMMDD)

890600

LIMITATION CODE

UNL

ABSTRACT

This report is the Draft Environmental Impact Statement (DEIS) for the proposed actions at the U.S. Army Kwajalein Atoll (USAKA). The proposed action would include continuation of current activities at USAKA and planned non-Strategic Defense Initiative (SDI) activities as well as proposed SDI activities. The U.S. Army Strategic Defense Command will conduct two public hearings as part of the environmental impact analysis process. The close of the public comment period on the DEIS is August 7, 1989. The comments received during the public hearings, as well as written comments received during the public-comment period, will be used to develop the final environmental impact statement which is scheduled to be published in October 1989.

KEYWORDS

MILITARY FACILITIES/environmental impact statements ; MARSHALL ISLANDS/military facilities ;BALLISTIC MISSILE DEFENSE/missile launching sites ;MISSILE LAUNCHING SITES/environmental impact statements

EDB Item 47

PRIMARY REPORT NUMBER

BNL--52192

TITLE ENGLISH

Medical status of Marshallese accidentally exposed to 1954 Bravo fallout radiation, January 1985--December 1987

PERSONAL AUTHOR

Adams, W.H.;Heotis, P.M.;Scott, W.A.

CORPORATE TEXT

Brookhaven National Lab., Upton, NY (USA)

PUB. DATE (YYMMDD)

870000

LIMITATION CODE

UNL

ABSTRACT

This report updates, through 1987, the medical findings on a population of Marshallese accidentally exposed to

radioactive fallout in 1954. The Marshall Islands Medical Program of the Medical Department, Brookhaven National Laboratory, issues these summaries for distribution to institutions and individuals world-wide who are concerned about the adverse medical consequences of radiation exposure in general or, in particular, the plight of the radiation-exposed Marshallese. The exposed Marshallese population originally comprised 64 persons on Rongelap Atoll who received an estimated 190 rads of whole-body external gamma radiation, 18 on Ailingnae Atoll who received 110 rads, and 159 on Utirik Atoll who received 11 rads. In addition, there were 3 fetuses on Rongelap, 1 on Ailingnae, and 8 on Utirik, each of which received equivalent whole-body doses. Because of radioiodines in the fallout, the thyroid gland received an additional exposure that was much greater than the whole-body dose, although its magnitude was, in part, a function of age at the time of exposure (Lessard et al., 1985).

KEYWORDS

HUMAN POPULATIONS/health hazards ;FALLOUT/biological radiation effects ;MORTALITY/evaluation ;MARSHALL ISLANDS;FALLOUT;BRAVO EVENT;DIAGNOSIS;NEOPLASMS; MORTALITY;EVALUATION;COMPILED DATA

EDB Item 48

PRIMARY REPORT NUMBER

UCID--18538-Rev.1

TITLE ENGLISH

Resuspension studies at Bikini Atoll

SUBTITLE ENGLISH

Revision 1

PERSONAL AUTHOR

Shinn, J.H.;Homan, D.N.;Robison, W.L.

CORPORATE TEXT

Lawrence Livermore National Lab., CA (USA)

PUB. DATE (YYMMDD)

890800

LIMITATION CODE

UNL

ABSTRACT

The following experiments were conducted on Bikini Atoll to provide key parameters for an assessment of inhalation exposure from plutonium-contaminated dust aerosols: (1) a characterization of background (plutonium activity, dust, plutonium, sea spray, and organic aerosol concentrations), (2) a study of plutonium resuspension from a bare field, (3) a study of plutonium resuspension by traffic, and (4) a study of personal inhalation exposure. Studies similar to (1) and (2) have been previously performed at Enewetak Atoll. 9 refs., 5 figs., 8 tabs.

KEYWORDS

PLUTONIUM/inhalation ;PARTICLE RESUSPENSION/risk assessment ;BIKINI;RADIATION PROTECTION;PLUTONIUM; INHALATION;AEROSOLS;DUSTS;AUTOMOBILES;DOSE EQUIVALENTS; OCCUPATIONAL EXPOSURE;PARTICLE SIZE;SOILS;PLANTS

EDB Item 49

PRIMARY REPORT NUMBER UCRL--53917

TITLE ENGLISH

Estimates of the radiological dose from ingestion of {sup 137}Cs and {sup 90}Sr to infants, children, and adults in the Marshall Islands

PERSONAL AUTHOR

Robison, W.L.;Phillips, W.A.

CORPORATE TEXT

Lawrence Livermore National Lab., CA (USA)

PUB. DATE (YYMMDD)

890217

LIMITATION CODE

UNL

ABSTRACT

In this report, we examine whether the radiological dose equivalent due to the intake of {sup 137}Cs and {sup 90}Sr at a contaminated atoll in the Marshall Islands would be greater when intake begins as an adult than when intake begins as an infant or child. We found that generally {sup 137}Cs contributes 97 to 98% of the dose and {sup 90}Sr contributes only 2 to 3 %. We also found that the integral 30-, 50-, and 70-y effective dose equivalent estimated for intake beginning as adults is greater than that for intake beginning at any other age. There are two factors that cause the adult estimated dose to be greater than the dose to infants and children. The major factor is the consistently higher intake of local foods, and consequently higher intake of {sup 137}Cs, for adults. The second is a combination of changing body weights, fractional deposits, and biological half-life for {sup 137}Cs with age, and the reduced concentration of {sup 137}Cs in food with time. Consequently, the estimated effective integral dose equivalents for adults due to ingestion of {sup 137}Cs and {sup 90}Sr can be used as a conservative estimate or intake beginning in infancy and childhood. 95 refs., 4 figs., 10 tabs.

KEYWORDS

MARSHALL ISLANDS/human populations ;INFANTS/dose equivalents ;CHILDREN/dose equivalents ;ADULTS/dose equivalents ;CESIUM 137;STRONTIUM 90;INFANTS;CHILDREN;ADULTS;INGESTION;BIOLOGICAL EFFECTS;FOOD CHAINS

EDB Item 50

ANALYTIC TITLE ENGLISH Evolution of reef and atoll margin carbonates, upper Eocene through lower Miocene, Enewetak, Marshall Islands

AUTHOR ANALYTIC

Saller, A.H.;Schlanger, S.O.

PAGE RANGE

243

PUB. DATE (YYMMDD)

880200

ABSTRACT

Two wells drilled along the margin of Enewetak Atoll penetrated approximately 1000 m of upper Eocene, Oligocene, and lower Miocene carbonates. Strontium isotope stratigraphy indicates relatively continuous



deposition of carbonate from 40 Ma to 20 Ma. Depositional environments show a gradual basinward progradation of facies with slope carbonates passing upward into fore-reef, reef, back-reef, and lagoonal carbonates. Slope strata contain wackestones and packstones with submarine-cemented lithoclasts, coral, coralline algae fragments, benthic rotaline forams, planktonic forams, and echinoderm fragments. Fore-reef strata are dominantly packstones and boundstones containing large pieces of coral, abundant benthic forams, coralline algae fragments, stromatoporoids(?), and minor planktonic forams. Reef and near-reef sediments include corallgal boundstones and grainstones with abundant benthic forams. Halimeda and miliolid forams are common in lagoonward parts of the back reef. Sponge borings, geopetal structures, and fractures are common in reef and fore-reef strata. Lagoonal strata are wackestones and packstones with common mollusks, coral, coralline algae, and benthic forams (rotaline and miliolid). Diagenesis has extensively altered strata near the atoll margin. Aragonite dissolution and calcite cements (radial and cloudy prismatic) are abundant in fore-reef, reef, and some back-reef strata. Petrographic and geochemical data indicate aragonite dissolution and calcite cementation in seawater at burial depths of 100 to 300 m. Dolomite occurs in slope and deeply buried reefal carbonates. Most dolomitization occurred at burial depths of more than 1000 m in cool marine waters circulating through the atoll. lagoonal strata are not significantly altered by marine diagenesis and still contain abundant primary aragonite and magnesium calcite.

KEYWORDS

MARSHALL ISLANDS/reefs ; REEFS/deposition ; ALGAE; CALCITE; CARBONATE ROCKS; CORALS; DISSOLUTION; FOSSILS; GEOCHEMISTRY; REEFS; MIOCENE EPOCH; DEPOSITION; STRATIGRAPHY

EDB Item 51

PRIMARY REPORT NUMBER UCRL--50007-87

ANALYTIC TITLE ENGLISH Summary of the Bikini Atoll ionizing-radiation survey  
TITLE ENGLISH Hazards Control Department annual technology review, 1987

AUTHOR ANALYTIC Shingleton, K.L.; Cate, J.L.; Trent, M.G.; Robison, W.L.  
PERSONAL AUTHOR Griffith, R.V.; Anderson, K.J. (eds.)  
CORPORATE TEXT Lawrence Livermore National Lab., CA (USA)

PAGE RANGE 1-13

PUB. DATE (YYMMDD) 880700

ABSTRACT This survey was designed to measure the beta dose rate from  $^{137}\text{Cs}$  and  $^{90}\text{Sr}/^{90}\text{Y}$  relative to previously measured gamma dose rates on Bikini and Eneu

Islands. The authors exposed modified Panasonic-802 thermoluminescent dosimeters (TLDs) in over 100 sites for six months to accomplish this task. The sites were selected to be either in areas of known high gamma dose rates, in areas where the Marshallese would likely spend most of their time upon resettlement, or in areas where experimental environmental changes has been made. Therefore, the beta and gamma dose rates do not represent island averages. The mean beta dose rate on Eneu ranged from 23 mrem/yr at 1 cm to 6 mrem/yr at 100 cm, as compared with a mean deep dose rate of 17.5 mrem/yr. The mean beta dose rate around houses and in general area on Bikini ranged from 425 mrem/yr at 1 cm to 178 mrem/yr at 100 cm, compared with a deep dose rate of about 154 mrem/yr. Because monitoring sites were specifically placed in the most-contaminated areas of Bikini and Eneu, the unshielded beta dose rates reported provide an upper limit of radiation dose; actual doses received by the Bikinians would be reduced significantly by clothing, footwear, and ground cover such as crushed coral, which reduces the beta dose rate by 80-90%. The amount of time spent in houses and in the minimally contaminated areas around houses and the lagoon would further reduce the beta dose rates reported here. 17 referenced, 12 figures, 1 table.

KEYWORDS

BIKINI/radiation monitoring ; CESIUM 137/beta dosimetry ; STRONTIUM 90/beta dosimetry ; BIKINI; PROGRESS REPORT; SURFACE CONTAMINATION

EDB Item 52

TITLE ENGLISH

Evolution of reef and atoll margin carbonates, upper Eocene through lower Miocene, Enewetak, Marshall Islands  
Saller, A.H.; Schlanger, S.O.

PERSONAL AUTHOR

PUB. DATE (YYMMDD)

880000

LIMITATION CODE

UNL

ABSTRACT

Two wells drilled along the margin of Enewetak Atoll penetrated approximately 1,000 m of upper eocene, Oligocene, and lower Miocene carbonates. Strontium isotope stratigraphy indicates relatively continuous deposition of carbonate from 40 Ma to 20 Ma. Depositional environments show a gradual basinward progradation of facies with slope carbonates passing upward into fore-reef, reef, back-reef, and lagoonal carbonates. Slope strata contain wackestones and packstones with submarine-cemented lithoclasts, coral, coralline algae fragments, benthic rotaline forams, planktonic forams, and echinoderm fragments. Fore-reef strata are dominantly packstones and boundstones containing large pieces of coral, abundant benthic

forams, coralline algae fragments, stromatoporoids(?), and minor planktonic forams. Reef and near-reef sediments include corallgal boundstones and grainstones with abundant benthic forams. Halimeda and miliolid forams are common in lagoonward parts of the back reef. Sponge borings, geopetal structures, and fractures are common in reef and fore-reef strata. Lagoonal strata are wackestones and packstones with common mollusks, coral, coralline algae, and benthic forams (rotaline and miliolid). Diagenesis has extensively altered strata near the atoll margin. Aragonite dissolution and calcite cements (radial and cloudy prismatic) are abundant in fore-reef, reef, and some back-reef strata. Petrographic and geochemical data indicate aragonite dissolution and calcite cementation in seawater at burial depths of 100 to 300 m. Dolomite occurs in slope and deeply buried reefal carbonates.

KEYWORDS

REEFS/deposition ; PETROLEUM DEPOSITS/geologic history ; CARBONATE ROCKS/deposition ; MARSHALL ISLANDS/petroleum geology ; NATURAL GAS DEPOSITS/geologic history ; REEFS; DEPOSITION; CONTINENTAL MARGIN; MIOCENE EPOCH; EXPLORATION; STRATIGRAPHY; SANDSTONES; CEMENTING; PETROGRAPHY; EOCENE EPOCH; ISOTOPE DATING; CALCITE; GEOCHEMISTRY; DOLOMITE

EDB Item 53

ANALYTIC TITLE ENGLISH Bikini Atoll still hazardous

AUTHOR ANALYTIC Vogt, H.H.

PAGE RANGE 1565-1566

PUB. DATE (YYMMDD) 890529

LIMITATION CODE UNL

ABSTRACT None

KEYWORDS BIKINI/contamination ; BIKINI/radiation hazards ; BIKINI; CONTAMINATION; NUCLEAR WEAPONS; NUCLEAR EXPLOSIONS; FALLOUT; FISSION PRODUCTS; STRONTIUM 90; CESIUM 137; RADIONUCLIDE MIGRATION; FOOD CHAINS; SOILS; COCONUT PALMS; VEGETABLES; FRUITS; RADIATION DOSES; HUMAN POPULATIONS

EDB Item 54

PRIMARY REPORT NUMBER ESC-WR--89-02

TITLE ENGLISH Starting points and backgrounds of calculations of the EOS-scenarios DG and GO with CO/sub 2/ emission maximum. Object subsidy project greenhouse scenarios (7002)

PERSONAL AUTHOR Okken, P.A.

CORPORATE TEXT Stichting Energieonderzoek Centrum Nederland, Petten (Netherlands). Energie Studie Centrum

PUB. DATE (YYMMDD) 890300

LIMITATION CODE UNL

ABSTRACT Calculations have been executed by means of the

MARKAL-model for the Dutch energy economy with exogenous national CO/sub 2/ emission limits. Starting points are the EOS-scenarios 'Dynamic and Growth' (DG) and 'Partial Development' (Gedeelde Ontwikkeling or GO) for the period 1989-2020. The model has been adjusted for the transport sector and altered with regard to CO/sub 2/. These alterations are discussed here. 4 figs., 37 refs., 3 tabs.

KEYWORDS

CARBON DIOXIDE/emission ;ELECTRIC POWER/uses ;  
NETHERLANDS;M CODES;MATHEMATICAL MODELS;COMPUTER  
CALCULATIONS;EMISSION;FORECASTING;ENERGY DEMAND;USES;  
NATURAL GAS;AIR POLLUTION ABATEMENT;GREENHOUSE PROJECT;  
ENVIRONMENTAL POLICY;ENERGY MODELS;NUMERICAL DATA;  
CALCULATION METHODS;RECYCLING;RENEWABLE ENERGY SOURCES

EDB Item 55

ANALYTIC TITLE ENGLISH Handling of radioactive fallout problems at Chernobyl  
accident (1986) as compared with that of Bikini accident  
(1954)

TITLE ENGLISH Radiation protection practice. IRPA 7

AUTHOR ANALYTIC Nishiwaki, Y.;Kawai, H.;Morishima, H.;Koga, T.;Niwa, T.;  
Sugimura, Y.

CORPORATE TEXT International Radiation Protection Association,  
Washington, DC (USA) ; Australian Radiation Protection  
Society, Sydney (Australia)

PAGE RANGE 1102-1105

PUB. DATE (YYMMDD) 880000

LIMITATION CODE UNL

ABSTRACT

We conducted an analysis in Japan of the highly  
radioactive fall-out on the Japanese fishing boat No. 5  
Fukuryu Maru that was engaged in fishing about 150 km  
east of Bikini at the time of the thermonuclear test  
conducted early in the morning of 1 March 1954, and  
which returned to Japan in the middle of the same month.

KEYWORDS

CHERNOBYLSK-4 REACTOR/contamination ;FALLOUT  
DEPOSITS/japan ;FISSION PRODUCT RELEASE/;  
PERSONNEL/radiation accidents ;REACTOR  
ACCIDENTS/contamination ;ACTIVITY LEVELS;AIR;BETA  
DETECTION;BETA SPECTRA;BIKINI;CALCITE;CESIUM 137;  
CONTAMINATION;COMPARATIVE EVALUATIONS;DUSTS;JAPAN;GAMMA  
RADIATION;GLOBAL FALLOUT;IODINE 131;IRRADIATION;ISOTOPE  
RATIO;KRYPTON 85;LOCAL FALLOUT;PARTICLE SIZE;PERSONNEL;  
RADIATION DOSES;RADIATION SYNDROME;RADIOACTIVITY;RARE  
GASES;SEAFOOD;SOCIO-ECONOMIC FACTORS;SOURCE TERMS;  
THERMONUCLEAR EXPLOSIONS;TUNA;URANIUM 237

EDB Item 56

PRIMARY REPORT NUMBER OEVS-Mitteilung--1988

Order number 940330-160606-96 -001-001  
page 41 set 11 with 111 of 111 items

ANALYTIC TITLE ENGLISH Bikini accident and Chernobyl accident  
TITLE ENGLISH 4. European congress and 13. regional congress of IRPA.  
20 years experience in radiation protection - a review  
and outlook

AUTHOR ANALYTIC Nishiwaki, Y.  
PERSONAL AUTHOR Tschirf, E.;Hefner, A. (ed.)  
CORPORATE TEXT Oesterreichischer Verband fuer Strahlenschutz (OeVS),  
Vienna (Austria)

PAGE RANGE 786-790

PUB. DATE (YYMMDD) 881100

LIMITATION CODE UNL

ABSTRACT The number of persons evacuated after Chernobyl  
accident is reported to be about 135000, which is almost  
comparable to that of the exposed to the atomic bombings  
at Hiroshima and Nagasaki in 1945. However, in case of  
atomic bombing, the whole body gamma and neutron  
radiation is received in an extremely short time,  
possibly of the order of some nano seconds. In addition,  
they received strong effects of blast waves, thermal  
radiation, and other toxic chemicals released to the  
environment due to destruction of various facilities by  
bombing. In case of Chernobyl accident, the whole body  
gamma radiation is received in a much longer time,  
possibly of the order of some hours, by the evacuees.  
The dose rate would be greatly different. In this  
respect, the accidental exposure to the strongly  
radioactive fallout at Bikini accident in 1954 may be  
more similar to the case of Chernobyl accident. The  
author makes some comparison of these cases, because of  
his involvement in investigation of the past radioactive  
fallout as observed in Japan. The radioactivity due to  
Chernobyl accident reached Japan at about 8 days after  
the accident. The volatile radionuclides such as I 131,  
Cs 137 were predominant. The radioactivity ratio Cs  
137/Cs 134 was about 2. In case of Bikini H-bomb test,  
all radioactivities are released instantaneously and  
radioactivities of non-volatile as well as volatile  
elements were observed. 2 figs.

KEYWORDS BIKINI/nuclear explosions ;CHERNOBYLSK-4  
REACTOR/reactor accidents ;HUMAN POPULATIONS/radiation  
doses ;NUCLEAR EXPLOSIONS/fallout ;REACTOR  
ACCIDENTS/fallout ;BIKINI;COMPARATIVE EVALUATIONS;  
FALLOUT

EDB Item 57

ANALYTIC TITLE ENGLISH Bikini Atoll ionizing radiation survey - May 1985 - May  
1986

TITLE ENGLISH Radiation protection practice. IRPA 7

AUTHOR ANALYTIC Shingleton, K.L.;Cate, J.L.;Trent, M.G.;Robison, W.L.

CORPORATE TEXT International Radiation Protection Association,  
Washington, DC (USA) ; Australian Radiation Protection  
Society, Sydney (Australia)  
PAGE RANGE 1370-1373  
PUB. DATE (YYMMDD) 880000  
LIMITATION CODE UNL  
ABSTRACT Between 1946 and 1958, the United States conducted 23  
nuclear tests at the Bikini Atoll in the Marshall  
Islands. The single largest detonation was the Bravo  
test, which resulted in extensive radioactive  
contamination of a number of islands and prevented the  
timely resettlement of the native population. Since 1958,  
many studies have been conducted to assess clean up  
options and the internal and external radiation doses  
the Bikinians would likely receive, should they resettle  
the islands. Although the external dose rates from  
{beta} and {gamma} radiation have been previously  
determined by aerial and ground measurement techniques,  
technical constraints limited the assessment of external  
{beta} dose rates from the Cs-137 and Sr-90/Y-90  
contamination on the islands. Now, because of the recent  
development of very thin thermoluminescent dosimeters  
(TLDs), these external {beta} dose rates can be  
measured.

KEYWORDS BIKINI/beta dosimetry ;BIKINI;CONTAMINATION;DOSE RATES;  
GROUND COVER;HOUSES;RADIATION DOSES;RADIATION MONITORING;  
SPATIAL DOSE DISTRIBUTIONS;THERMOLUMINESCENT DOSEMETERS

EDB Item 58  
PRIMARY REPORT NUMBER UCRL--53840  
TITLE ENGLISH Radiological conditions at Bikini Atoll: Radionuclide  
concentrations in vegetation, soil, animals, cistern  
water, and ground water  
PERSONAL AUTHOR Robison, W.L.; Conrado, C.L.; Stuart, M.L.  
CORPORATE TEXT Lawrence Livermore National Lab., CA (USA)  
PUB. DATE (YYMMDD) 880531  
ABSTRACT This report is intended as a resource document for the  
eventual cleanup of Bikini Atoll and contains a summary  
of the data for the concentrations of {sup 137}Cs, {sup  
90}Sr, {sup 239+240}Pu, and {sup 241}Am in vegetation  
through 1987 and in soil through 1985 for 14 islands at  
Bikini Atoll. The data for the main residence island,  
Bikini, and the most important island, Eneu, are  
extensive; these islands have been the subject of a  
continuing research and monitoring program since 1974.  
Data for radionuclide concentrations in ground water,  
cistern water, fish and other marine species, and pigs  
from Bikini and Eneu Islands are presented. Also  
included are general summaries of our resuspension and

rainfall data from Bikini and Eneu Islands. The data for the other 12 islands are much more limited because samples were collected as part of a screening survey and the islands have not been part of a continuing research and monitoring program. Cesium-137 is the radionuclide that produces most of the estimated dose for returning residents, mostly through uptake by terrestrial foods and secondly by direct external gamma exposure. Remedial measures for reducing the {sup 137}Cs uptake in vegetation are discussed. 40 refs., 32 figs., 131 tabs.

KEYWORDS

NUCLEAR EXPLOSIONS/fallout ;BIKINI/radiation monitoring ;ENIWETOK/radiation monitoring ;CESIUM 137/radioecological concentration ;STRONTIUM 90/radioecological concentration ;PLUTONIUM 239/radioecological concentration ;PLUTONIUM 240/radioecological concentration ;AMERICIUM 241/radioecological concentration ;FALLOUT;TESTING; BIKINI;ENIWETOK;PLANTS;SOILS;SAMPLING;GROUND WATER; FISHES;SWINE;PARTICLE RESUSPENSION;DOSE EQUIVALENTS; REMEDIAL ACTION

EDB Item 59

TITLE ENGLISH

Day of two suns. US nuclear testing and the Pacific Islanders

PERSONAL AUTHOR

Dibblin, Jane.

PUB. DATE (YYMMDD)

880000

ABSTRACT

The book focuses on two Pacific communities affected by nuclear testing, the people of Rongelap atoll irradiated by fallout, and the people of Kwajalein atoll forced to leave their islands so it could be used as a target area for missiles launched from the western USA. Both atolls are part of the Marshall Islands which are on the eastern side of the groups of islands known as Micronesia. The USA conducted 66 nuclear tests in the period 1946-1958, one on Bikini Island, codenamed Bravo, causing the contamination of Rongelap. Following the halting of atmospheric nuclear explosions in 1958 the area became a missile testing target area. The reasons why the Marshall Islands were used, the effects of the fallout and destruction of the islanders way of life when they were moved from their homes is described. It draws widely on experience of the Marshall Islanders themselves. One of the appendices lists the tests and displacement in the Marshall Islands in chronological order. (U.K.).

KEYWORDS

BRAVO EVENT/environmental impacts ;MARSHALL ISLANDS/evacuation ;MARSHALL ISLANDS/local fallout ; NUCLEAR WEAPONS/test facilities ;BIOLOGICAL RADIATION EFFECTS;CONTAMINATION;HISTORICAL ASPECTS;EVACUATION;

Order number 940330-160606-96 -001-001  
page 44 set 11 with 111 of 111 items

MISSILES;PACIFIC OCEAN;USA

EDB Item 60  
PRIMARY REPORT NUMBER AD-A--955363/7/XAB  
TITLE ENGLISH Nuclear test summary - trinity-hardtack. Sanitized  
CORPORATE TEXT Defense Atomic Support Agency, Washington, DC (USA)  
PUB. DATE (YYMMDD) 620815  
ABSTRACT None  
KEYWORDS ATMOSPHERIC EXPLOSIONS/trinity event ;HARDTACK PROJECT/;  
NUCLEAR EXPLOSIONS/atmospheric explosions ;TRINITY  
EVENT/;EXPERIMENTAL DATA

EDB Item 61  
PRIMARY REPORT NUMBER AD-A--197314/8/XAB  
TITLE ENGLISH Pacific Enewetak Atoll Crater Exploration (PEACE)  
Program, Enewetak Atoll, Republic of the Marshall  
Islands. Part 4. Analysis of borehole gravity surveys  
and other geologic and bathymetric studies in vicinity  
of Oak and Koa craters  
PERSONAL AUTHOR Henry, T.W.; Wardlaw, B.R.  
CORPORATE TEXT Geological Survey, Denver, CO (USA)  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The Pacific Enewetak Atoll Crater Exploration (PEACE)  
Program was established to resolve a number of questions  
for the Department of Defense (DOD) about the geologic  
and material-properties parameters of two craters (KOA  
and OAK), formed by near-surface bursts of high-yield  
thermonuclear devices on the northern margin of Enewetak  
Atoll, Marshall Islands, in 1958. The multidisciplinary  
studies conducted by the USGS in collaboration with  
other organizations during 1984 through 1987 were part  
of a much larger research initiative by the DNA to  
better understand the dynamic properties of  
strategic-scale nuclear bursts and the relevance of the  
Pacific Proving Grounds (PPG) craters to issues of  
strategic basing and targeting of nuclear weapons. Major  
topics include: Borehole gravity; Paleontologic evidence  
for mixing; Electron paramagnetic resonance studies;  
Bathymetric studies of OAK crater; Constraints on  
densification and piping for OAK; and Additional studies  
of geologic crater models.  
KEYWORDS CRATERS/boreholes ;ENIWETOK/nuclear explosions ;NUCLEAR  
EXPLOSIONS/craters ;BARGES;BATHYMETRY;CRATERS;BOREHOLES;  
DENSITY;DYNAMICS;ENIWETOK;GEOLOGIC MODELS;GEOLOGY;  
GRAVIMETRY;MARSHALL ISLANDS;PALEONTOLOGY;STRATIGRAPHY;  
YIELDS



Order number 940330-160606-96 -001-001  
page 45 set 11 with 111 of 111 items

EDB Item 62  
PRIMARY REPORT NUMBER DOE/ET/20485--T4  
TITLE ENGLISH Report of refurbishment of Utirik photovoltaic system  
PERSONAL AUTHOR Ratajczak, A.F.  
CORPORATE TEXT National Aeronautics and Space Administration,  
Cleveland, OH (USA). Lewis Research Center  
PUB. DATE (YYMMDD) 881011  
ABSTRACT This report describes the repairs and modifications  
made to the Photovoltaic Power system installed on the  
island of Utirik in the Republic of the Marshall Islands  
in the Micronesia region of the Pacific.  
KEYWORDS PHOTOVOLTAIC POWER PLANTS/repair ;COST;ELECTRIC  
BATTERIES;MARSHALL ISLANDS;MODIFICATIONS;OFF-PEAK ENERGY  
STORAGE;REPAIR;SOLAR BATTERY CHARGERS;TRAVEL

EDB Item 63  
PRIMARY REPORT NUMBER ACIESP--60-Vol.1  
ANALYTIC TITLE ENGLISH Historical review of Bikini radiation accident in 1954  
and radiation protection in Japan  
TITLE ENGLISH Proceedings of the 6. Japan-Brazil Symposium on Science  
and Technology  
AUTHOR ANALYTIC Kumatori, T.  
CORPORATE TEXT Academia de Ciencias do Estado de Sao Paulo (Brazil)  
PUB. DATE (YYMMDD) 880000  
ABSTRACT None  
KEYWORDS BIKINI/historical aspects ;BIKINI/thermonuclear  
explosions ;JAPANESE ORGANIZATIONS/radiation protection ;  
JAPANESE ORGANIZATIONS/thermonuclear explosions ;  
JAPANESE ORGANIZATIONS/victims compensation ;BIKINI;  
BIOLOGICAL RADIATION EFFECTS;RADIATION ACCIDENTS

No data for number 564243 (item 64)

No data for number 564243 (item 64)

No data for number 550982 (item 65)

No data for number 550982 (item 65)

EDB Item 66  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1  
ANALYTIC TITLE ENGLISH Avifauna of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The  
ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Berger, A.J.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000

5003479

ABSTRACT

About 41 species of birds have been recorded at Eniwetok. The birds that have arrived there have had to be strong fliers. Many of the native seabirds are species that have a vast range in the Pacific region, and many of them spend only the breeding season on land. At least 12 species are known to breed on the atoll, and at least four other species are thought to nest there. Many other birds probably include Eniwetok within their range.

KEYWORDS

BIRDS/species diversity ; ENIWETOK/baseline ecology ;  
BIRDS; ENIWETOK; POPULATION DYNAMICS; SITE CHARACTERIZATION

EDB Item 67

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH Biology of the rodents of Enewetak Atoll

TITLE ENGLISH

The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes

AUTHOR ANALYTIC

Jackson, W.B.; Vessey, S.H.; Bastian, R.K.

PERSONAL AUTHOR

Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT

Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN 870000

PUB. DATE (YYMMDD)

ABSTRACT

Roof rats and Polynesian rats, introduced to the atoll by 20th Century commerce and the Micronesians, respectively, were present allopatrically on the larger islets. Of necessity, they were largely vegetarians. Reproductive cycles were keyed to rainfall patterns. High density populations had high stress indices, including high parasite loads. The rats, at the top of the terrestrial food pyramid, constituted a bioenvironmental monitor that was rarely utilized during the several test programs. Bioconcentration of radioisotopes, especially <sup>137</sup>Cs and <sup>60</sup>Co, occurred; rats implanted with dosimeters were determined to function as environmental radiation monitors. They hypothesized that roof rats on Enjebi survived the nearby nuclear detonation. Analysis of plasma transferrins indicated greater heterozygosity in the northern atoll rat populations. The incidence of oral palatal ridge deformations also was positively correlated with environmental radiation levels, but other gross indications of radiation effect were not found.

KEYWORDS

ENIWETOK/baseline ecology ; RODENTS/biology ;  
RODENTS/radionuclide kinetics ; BIOLOGICAL INDICATORS;  
BIOLOGICAL RADIATION EFFECTS; CESIUM 137; COBALT 60;  
ENIWETOK; FOOD CHAINS; POPULATION DENSITY; RODENTS; BIOLOGY

EDB Item 68  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1  
ANALYTIC TITLE ENGLISH Terrestrial environments and ecology of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The  
ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Reese, E.S.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The terrestrial ecosystem of Enewetak Atoll is the  
result of the dynamic interaction between the biota  
associated with the small dry land area and physical  
parameters of the environment, especially the climate,  
soil, and ground water. The shrubs and trees, man, birds,  
rats, and land crabs are among the more conspicuous  
elements of the terrestrial biota, whereas climatic  
events, the soils, and the availability of ground water  
are the most important physical components of the  
ecosystem.  
KEYWORDS ENIWETOK/terrestrial ecosystems ;BASELINE ECOLOGY;BIRDS;  
CLIMATES;CRABS;ENIWETOK;GROUND WATER;MAN;RATS;SHRUBS;  
SOILS;TREES

EDB Item 69  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1  
ANALYTIC TITLE ENGLISH Trophic relationships in Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The  
ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Marshall, N.; Gerber, R.P.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Some of the biologists who were attracted to Enewetak  
Atoll after the marine research laboratory opened have  
been studying species that are typical of reef environs  
and plentiful in this setting. Some have been interested  
in ecological features, particularly those of the  
well-developed windward reefs; and some, who have  
focused on the reef areas as an ecological subsystem,  
have been interested in the processes of the atoll as a  
whole. They start by noting three contrasting  
environments in this large, but typical, atoll. First,  
there are the coral reefs and knolls, the former almost

completely enclosing the atoll, the latter scattered through the lagoon and numbering over 2000. Then there are the open waters of the lagoon. Finally, there is the lagoon benthic environment (other than the coral knolls). In a real sense, and in comparison with the rest, the reefs and knolls are very productive, even though the oceanic waters surrounding the atoll are low in nutrients and organic food sources.

KEYWORDS

ENIWETOK/baseline ecology ; BENTHOS; CORALS; ECOSYSTEMS; ENIWETOK; NUTRIENTS; SITE CHARACTERIZATION

EDB Item 70

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH Reef processes: energy and materials flux

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes

AUTHOR ANALYTIC Marsh, J.A. Jr.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT An overview is presented of the many studies that have been conducted at Eniwetok on reef community processes, making major contributions to an understanding of these processes. These studies have also influenced the context in which many ecologists think about reef systems. Attention is focused on community metabolism, calcification processes at the ecosystem and organismal level, as well as nitrogen and phosphorus cycling. In addition, the role of detritus, coral nutrition, and ecological relationships of reef fishes are discussed.

KEYWORDS

ENIWETOK/ecosystems ; ENIWETOK/energy balance ; CORALS; DETRITUS; ENIWETOK; ECOSYSTEMS; FISHES; MINERAL CYCLING

EDB Item 71

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH Intertidal ecology of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes

AUTHOR ANALYTIC Kohn, A.J.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT The author summarizes the present state of knowledge of the ecology of intertidal environments at Eniwetok.

Studies over the past 25 years have documented the major outlines of community organization and have revealed some important, unexpected characteristics. The knowledge these studies have provided of the identity of the major organisms present, their population densities, distribution patterns, temporal variations, habitat requirements, and trophic roles and interactions is evaluated. However, a satisfactory model of intertidal community structure and processes will require more intensive future studies.

KEYWORDS

ENIWETOK/baseline ecology ;ANIMALS;ENIWETOK;ENVIRONMENT;  
HABITAT;PLANTS;POPULATION DENSITY

EDB Item 72

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH Subtidal environments and ecology of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The

AUTHOR ANALYTIC

Colin, P.L.

PERSONAL AUTHOR

Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)

CORPORATE TEXT

Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD)

870000

ABSTRACT

Subtidal environments of Eniwetok are the lagoon and outer reefs and the passage between them which are submerged at low tides. The lagoon and outer reefs are separated, except at passes, by the intertidal reef flat. The outer slope of the atoll is different from the lagoon. The present discussion will include descriptive information on the outer slope to 300 to 400 m depth, but below those depths there is little detailed information concerning the biological communities or geological perspectives.

KEYWORDS

ENIWETOK/baseline ecology ;ENIWETOK/environment ;  
ENIWETOK;ENVIRONMENT;SITE CHARACTERIZATION

EDB Item 73

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH Meteorology and atmospheric chemistry of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The

AUTHOR ANALYTIC

Merrill, J.T.; Duce, R.A.

PERSONAL AUTHOR

Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)

CORPORATE TEXT

Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD)

870000

ABSTRACT The authors discuss the various aspects of the weather of Eniwetok Atoll. The mean and variation for each observed quantity of interest are briefly covered and the authors note their state of knowledge of these factors. In relation to atmospheric chemistry of the atoll, the authors make use of the extensive data collected during experiments there in 1979.

KEYWORDS ENIWETOK/atmospheric chemistry ; ENIWETOK/meteorology ; ENIWETOK;METEOROLOGY;WEATHER

EDB Item 74  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1  
ANALYTIC TITLE ENGLISH Oceanography of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Atkinson, M.J.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN 870000  
PUB. DATE (YYMMDD)  
ABSTRACT The author presents a general oceanography of the northern Marshall Islands and then focuses on the oceanography of Eniwetok Lagoon. Frequent comparisons are made between Eniwetok and Bikini. Windward and leeward cross-reef currents, channel currents, and tidal flow are the major factors influencing the exchange of water between atoll lagoons and the surrounding ocean. Wind-driven circulation contributes primarily to internal circulation. Upwelling of the windward side of lagoons may occur but does not seem to be a generalized feature of deep lagoon circulation. Deep water flow appears to orient itself toward the channels of net water output.

KEYWORDS ENIWETOK/oceanography ; BIKINI; ENIWETOK; OCEANOGRAPHY; UPWELLING; WATER CURRENTS

EDB Item 75  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1  
ANALYTIC TITLE ENGLISH Geology and geohydrology of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Ristvet, B.L.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN 870000  
PUB. DATE (YYMMDD)

ABSTRACT

Data are summarized on the geological aspects of Eniwetok gathered over the last 40 years. The history of investigations may be divided into three periods: pre-1946, 1946-1964 and post-1964. The first period was one of discovery and initial exploration, focusing on surficial geologic features. Beginning in 1946, there was a significant increase in knowledge of atolls resulting from a series of comprehensive scientific studies which established baselines to assess effects from nuclear weapons testing conducted at Eniwetok between 1946 and 1958. From 1964 to the present, scientific studies have been of two types: those which have continued to address the problems conceptualized by earlier studies and those which have addressed the effects of the nuclear weapons testing. Studies of the hydrology of Eniwetok were initiated in 1972 to evaluate possible environmental effects of the proposed PACE high explosive craters on the ground-water resources of the islands.

KEYWORDS

ENIWETOK/geology ; ENIWETOK/hydrology ; NUCLEAR WEAPONS/testing ; BASELINE ECOLOGY; ENIWETOK; GEOLOGY; HYDROLOGY; HISTORICAL ASPECTS; TESTING

EDB Item 76

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH Physiography of Enewetak Atoll

TITLE ENGLISH

The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes

AUTHOR ANALYTIC

Colin, P.L.

PERSONAL AUTHOR

Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT

Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD)

870000

ABSTRACT

The author discusses the location, size, weather and climate of Eniwetok. The environment is also described, focusing on the lagoon, the reef flat, the seaward slope and the islands at Eniwetok. Man-made features that are evaluated include quarries which were excavated for building or road construction. A number of craters which remain from nuclear weapons testing are discussed.

KEYWORDS

ENIWETOK/climates ; ENIWETOK/environment ; ENIWETOK/geography ; NUCLEAR WEAPONS/testing ; ENIWETOK; CLIMATES; ENVIRONMENT; GEOGRAPHY; HYDROLOGY; TESTING

EDB Item 77

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1

ANALYTIC TITLE ENGLISH History of the people of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Kiste, R.C.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT This chapter focuses upon the people of Enewetak. It examines their history, the structure of their culture and society, the ways they have coped with the colonial powers that governed the islands, and their response to their resettlement on Ujilang Atoll. Some mention is necessarily made of the Bikini community because the histories of the two peoples are intertwined.  
KEYWORDS ENIWETOK/human populations ;HUMAN POPULATIONS/historical aspects ;BIKINI;ENIWETOK

EDB Item 78  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.1  
ANALYTIC TITLE ENGLISH Research at Enewetak Atoll: a historical perspective  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 1, The ecosystem: Environments, biotas, and processes  
AUTHOR ANALYTIC Helfrich, P.; Ray, R.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Between 1946 and 1958, 43 nuclear devices were tested at Eniwetok. This testing program provided an opportunity for research which eventually led to the establishment of the Eniwetok Marine Biological Laboratory in 1954. From 1954 to 1974 research was broadly aimed at increasing their knowledge of this diverse coral atoll ecosystem. The second period of research began with the reorganization of the laboratory in 1974. The major projects of the 1975-1980 period were (1) a study of the circulation of the Eniwetok Lagoon, (2) research on the dynamics of ground water resources of Eniwetok Atoll, and (3) studies of diguatera fish poisoning at Eniwetok.  
KEYWORDS CORALS/research programs ;ENIWETOK/research programs ; NUCLEAR WEAPONS/testing ;CORALS;ECOSYSTEMS;ENIWETOK; HISTORICAL ASPECTS;TESTING;SITE CHARACTERIZATION

EDB Item 79  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2



Order number 940330-160606-96 -001-001  
page 53 set 11 with 111 of 111 items

ANALYTIC TITLE ENGLISH Miscellaneous species records of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Titgen, R.H.; Burch, B.L.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The aim of this report is to provide a checklist of  
miscellaneous plant and animal species recorded at  
Eniwetok. The list includes some fossil material and/or  
material from drill cores.  
KEYWORDS ANIMALS/taxonomy ; ENIWETOK/baseline ecology ;  
PLANTS/taxonomy ; ANIMALS; TAXONOMY; DRILL CORES; ENIWETOK;  
PLANTS; SITE CHARACTERIZATION; SPECIES DIVERSITY

EDB Item 80  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Mammals of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Reese, E.S.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Although man is the dominant mammal of Eniwetok, marine  
mammals are occasional visitors there. Twenty-seven  
species of whales, dolphins, and porpoises may be  
expected to occur at Eniwetok Atoll. A checklist is  
provided of the mammals of Eniwetok.  
KEYWORDS ENIWETOK/baseline ecology ; MAMMALS/species diversity ;  
MAMMALS/taxonomy ; ENIWETOK; MAMMALS; TAXONOMY; SITE  
CHARACTERIZATION

EDB Item 81  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Birds of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Berger, A.J.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000

ABSTRACT Most of the seabirds that occur at Eniwetok have a very wide range in the Pacific basin, and they have not been shown to demonstrate a tendency for subspeciation. Because of its geographical location, Eniwetok provides a nesting habitat for some species whose primary breeding range is north of the atoll and for others whose primary breeding range is south of it. Approximately 17 species of shorebirds that nest in Alaska or Siberia have been recorded as migrating to the Eniwetok Atoll in winter. A checklist of Eniwetok birds is presented.

KEYWORDS BIRDS/species diversity ;BIRDS/taxonomy ;  
ENIWETOK/baseline ecology ;BIRDS;TAXONOMY;ENIWETOK;SITE  
CHARACTERIZATION

EDB Item 82

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Reptiles of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics

AUTHOR ANALYTIC Lamberson, J.O.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
870000

PUB. DATE (YYMMDD)

ABSTRACT The goals of this report are to provide a checklist of all the reptiles found on Eniwetok. Seven species of lizards and one species of blind snake comprise the known terrestrial herpetofauna there. Species found on nearby atolls may also be present on Eniwetok; however, no additional species have been collected from there. No amphibians or sea snakes have been found on Eniwetok. The biogeography and the ecology of the reptiles found there are presented.

KEYWORDS ENIWETOK/baseline ecology ;REPTILES/taxonomy ;COMPILED  
DATA;ENIWETOK;REPTILES;TAXONOMY;SITE CHARACTERIZATION;  
TABLES

EDB Item 83

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Annotated checklist of the fishes of Enewetak Atoll and  
other Marshall Islands

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics

AUTHOR ANALYTIC Randall, J.E.; Randall, H.A.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)

Order number 940330-160606-96 -001-001  
page 55 set 11 with 111 of 111 items

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT This report provides a checklist of the reef, shore,  
and epipelagic fishes known from the Marshall Islands. A  
total of 817 species in 338 genera and 92 families is  
recorded. Deep-water fishes have been omitted from the  
checklist because only a few such fishes have been  
reported from the area. An attempt is made to illustrate  
a few of the most conspicuous species.  
KEYWORDS ENIWETOK/baseline ecology ; FISHES/species diversity ;  
FISHES/taxonomy ; COMPILED DATA; ENIWETOK; FISHES; TAXONOMY;  
SITE CHARACTERIZATION; TABLES

EDB Item 84  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Protochordates of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Eldredge, L.G.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Few protochordates have been recorded from Eniwetok  
Atoll. A checklist of Ascidians and Cephalochordates  
from Eniwetok is included.  
KEYWORDS ENIWETOK/baseline ecology ; VERTEBRATES/taxonomy ;  
ENIWETOK; SITE CHARACTERIZATION; VERTEBRATES; TAXONOMY

EDB Item 85  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Echinodermata other than Holothuroidea of Enewetak  
Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Devaney, D.M.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT An attempt is made to bring together numerous records  
on the echinoderm fauna other than the holothurians at  
Eniwetok. In comparison with the Marshall Islands as a  
whole, knowledge of the Eniwetok echinoderms is  
considerable. A checklist is included of the echinoderm

KEYWORDS nonholothurian species of Eniwetok.  
ECHINODERMS/taxonomy ; ENIWETOK/baseline ecology ;  
COMPILED DATA; ECHINODERMS; TAXONOMY; ENIWETOK; SITE  
CHARACTERIZATION; TABLES

EDB Item 86  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Holothurians of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Cutress, B.M.; Rowe, F.W.E.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT An attempt is made to list the holothurians recorded on  
Eniwetok. A number of identified species are discussed  
in relation to their biogeography and ecology. Most of  
the species of holothurians recorded in the checklist  
were included in an unpublished systematic report by B.  
M. Cutress prepared for the Mid-Pacific Research  
Laboratory in 1956. Collection records based on that  
study are presented in the Appendix.  
KEYWORDS ECHINODERMS/species diversity ; ECHINODERMS/taxonomy ;  
ENIWETOK/baseline ecology ; COMPILED DATA; ECHINODERMS;  
TAXONOMY; ENIWETOK; SITE CHARACTERIZATION

EDB Item 87  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Crustacea Decapoda (Brachyura and Anomura) of Enewetak  
Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Garth, J.S.; Haig, J.; Knudsen, J.W.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The goals of this report are to list the numerous  
species of crabs found at Eniwetok. An attempt is made  
to indicate their biogeographic implications and to  
summarize their ecology. The Anomura presently known  
from Eniwetok Atoll comprise 76 species, representing 29  
genera and 10 families. Of this number, 48 species are  
new to Eniwetok, and 43 are new to the Marshall Islands  
as well. The Brachyura presently known from Eniwetok

Atoll comprise 291 species, representing 115 genera and 16 families. Of this number, 218 species are new to Eniwetok, and 170 are new to the Marshall Islands as well.

KEYWORDS

DECAPODS/species diversity ;DECAPODS/taxonomy ;  
ENIWETOK/baseline ecology ;COMPILED DATA;DECAPODS;  
TAXONOMY;ENIWETOK;SITE CHARACTERIZATION;TABLES

EDB Item 88

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Crustacea decapoda (Penaeidea, Stenopodidea, Caridea, and Palinura) of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Devaney, D.M.; Bruce, A.J.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT Biological surveys made during 1946 and 1947 in the northern Marshall Islands included faunal collections that resulted in a publication by Chace (1955) on several groups of shrimps. In this work, six species of sergestid, pasiphaeid, processid, and alpheid shrimps were recorded from Enewetak. Since then the number of taxa from the atoll has increased until now nearly 150 decapod shrimp and lobster species are recognized. Pontoniines and alpheids account for 73% (106 species) of the total number. There are several new records not only for Enewetak but also for the Marshalls, and in some cases, for the Pacific. A taxonomic checklist and a section on collection data for new records are provided.

KEYWORDS

DECAPODS/species diversity ;DECAPODS/taxonomy ;  
ENIWETOK/baseline ecology ;COMPILED DATA;DECAPODS;  
TAXONOMY;ENIWETOK;LOBSTERS;SHRIMP;SITE CHARACTERIZATION;  
SURVEYS;TABLES

EDB Item 89

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Ostracoda (Myodocopina) of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Kornicker, L.S.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT

Ostracods in the superorder Mydocopa, excluding the planktonic suborder Halocypridina, which is outside the scope of the present report, have not previously been reported from Micronesia. A comprehensive checklist of Ostracoda from southeast Asia is concerned with the area between 25<sup>0</sup>N and 11<sup>0</sup>S latitude and 140<sup>0</sup>E and 85<sup>0</sup>E longitude. The area includes the western edge of Micronesia, but a brief perusal of the checklist revealed no listing of specimens from Micronesia. A small collection of Enewetak ostracods in the suborder Mydocopina at the National Museum of Natural History, Smithsonian Institution, contains members of all five families that comprise the suborder. Although the species in the collection are capable of swimming, and do so occasionally, they spend most of their existence crawling on, or burrowing in, the substrate. An exception to this is members of the mainly pelagic genus Cypridina, which is represented in the collection by two species. Some of the Enewetak specimens are illustrated.

KEYWORDS

ARTHROPODS/taxonomy ; ENIWETOK/baseline ecology ;  
ARTHROPODS; TAXONOMY; ENIWETOK; SITE CHARACTERIZATION

EDB Item 90

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Lagoon plankton of Enewetak Atoll

TITLE ENGLISH

The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics

AUTHOR ANALYTIC

Gerber, R.P.

PERSONAL AUTHOR

Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)

CORPORATE TEXT

Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD)

870000

ABSTRACT

Studies on the species composition of lagoon zooplankton at Enewetak Lagoon and nearby atolls have for the most part focused on the holoplanktonic organisms, forms that are permanently planktonic all of their lives; these forms are the main attention of this chapter. Because information is lacking on the life history of many of the species mentioned, some meroplanktonic forms - organisms that are temporarily planktonic - are no doubt included in this checklist. A variety of sampling methods have been used to collect the zooplankton, and each method has its inherent advantages and disadvantages. In a sense it is perhaps fortunate that no one method is best to sample the various types of zooplankton. One important aspect

lacking in the data is adequate seasonal samplings to provide information on how species composition and abundance change over time. Whereas most of the lagoon plankton studies were based on samples collected over a few days in one season, the present author has sampled more extensively, during two winter periods and one summer period.

KEYWORDS

ENIWETOK/baseline ecology ;ZOOPLANKTON/species diversity ;ZOOPLANKTON/taxonomy ;COMPILED DATA;ENIWETOK;SAMPLING;SEASONAL VARIATIONS;SITE CHARACTERIZATION;TABLES;ZOOPLANKTON;TAXONOMY

EDB Item 91

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Nonplanktonic copepoda of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Devaney, D.M.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT

The copepod fauna of Enewetak is based on studies carried out on symbiotic (commensal and parasitic) species as well as those found as part of the plankton community. A checklist of copepod fauna is included.

KEYWORDS

COPEPODS/taxonomy ;ENIWETOK/baseline ecology ;COMPILED DATA;COPEPODS;TAXONOMY;ENIWETOK;SITE CHARACTERIZATION;SYMBIOSIS;TABLES;ZOOPLANKTON

EDB Item 92

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Cirripedia of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Titgen, R.H.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT

There has been relatively little research done on barnacles at Eniwetok. Only nine species have been reported from there. A checklist of barnacles found at Eniwetok Atoll is presented. The list also includes species that probably occur there because so few of the species that may occur there have been reported.

Order number 940330-160606-96 -001-001  
page 60 set 11 with 111 of 111 items

KEYWORDS CRUSTACEANS/taxonomy ;ENIWETOK/baseline ecology ;  
COMPILED DATA;CRUSTACEANS;TAXONOMY;ENIWETOK;SITE  
CHARACTERIZATION

EDB Item 93  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Stomatopod crustacea of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Reaka, M.L.; Manning, R.B.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT This study provides a checklist and discusses the  
biogeographic relationships of the 12 species of  
Stomatopoda (mantis shrimps) now known to occur on  
Enewetak Atoll. Five species are widely distributed  
throughout the Indo-West Pacific region, and three  
species have somewhat more restricted ranges in the  
Indo-West Pacific and Indian Ocean. Four species are  
endemic to the Central Pacific (two to Enewetak), and  
three taxa need further taxonomic investigation, which  
may demonstrate further endemism. Stomatopods from  
Enewetak are dwarfed in body size compared to their  
mainland relatives. Small size has strong consequences  
for life history and evolutionary patterns in  
stomatopods, and in particular is likely to generate  
endemism. They provide information on the color patterns  
of the stomatopods from Enewetak, showing which traits  
are the most reliable indicators of species identity for  
taxonomic and field research and which traits are most  
likely to be influenced by body size, sex, or habitat.  
Several anomalies in usually invariant color traits are  
found in stomatopods from Aomon Island, which was closer  
to sources of radiation from atomic testing than more  
southern islands in the atoll. They also summarize what  
is known about the habitat and fighting behavior of the  
coral-dwelling mantis shrimps from Enewetak. for each of  
the above topics, they identify or discuss all previous  
literature on the stomatopods of Enewetak.  
KEYWORDS CRUSTACEANS/taxonomy ;ENIWETOK/baseline ecology ;  
BEHAVIOR;COMPILED DATA;CRUSTACEANS;TAXONOMY;ENIWETOK;  
HABITAT;SITE CHARACTERIZATION;SPECIES DIVERSITY;TABLES

EDB Item 94  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

5003494



ANALYTIC TITLE ENGLISH Pycnogonida of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Child, C.A.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Pycnogonids are very scarce on Eniwetok with only five  
species in four genera known there. A sixth, Nymphon  
micronesicum is also known from Bikini. This is a very  
small faunule when considering the great diversity of  
this class of arthropods in the oceans of the world. A  
checklist is included of Pycnogonida of Eniwetok Atoll.  
KEYWORDS ARTHROPODS/taxonomy ; ENIWETOK/baseline ecology ;  
ARTHROPODS;TAXONOMY;ENIWETOK;SITE CHARACTERIZATION;  
SPECIES DIVERSITY

EDB Item 95  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Insects and allies (Arthropoda) of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Samuelson, G.A.; Nishida, G.M.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Insects and related terrestrial arthropods of Enewetak  
Atoll remain inadequately investigated. Woodbury (1962)  
included an inventory of arthropods known from the atoll  
in which he indicated that ectoparasites were taken from  
10 species of birds; altogether he reported 45 species  
or subspecies authentically recorded from the atoll. The  
present list increases the number of arthropods to 191  
species (or subspecies) and must still be considered  
preliminary, as records are lacking for many expected  
groups. Before this list can be completed, further  
collections and their study are required, especially of  
the soil fauna, ectoparasites and nidicoles of reptiles,  
birds, and rodents, and the forms associated with humans  
and human habitations. A checklist of Enewetak insects  
and related arthropods is provided.  
KEYWORDS ENIWETOK/baseline ecology ; INSECTS/taxonomy ; COMPILED  
DATA;ENIWETOK;INSECTS;TAXONOMY;SITE CHARACTERIZATION;  
TABLES

Order number 940330-160606-96 -001-001  
page 62 set 11 with 111 of 111 items

EDB Item 96  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Mollusca of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Kay, E.A.; Johnson, S.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT This report provides a check list of all the mollusks  
found on Eniwetok, both living and fossils. The most  
conspicuous species are illustrated and their ecology is  
summarized.  
KEYWORDS ENIWETOK/baseline ecology ;MOLLUSCS/taxonomy ;COMPILED  
DATA;ENIWETOK;MOLLUSCS;TAXONOMY;SITE CHARACTERIZATION;  
TABLES

EDB Item 97  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Polychaetes of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Devaney, D.M.; Bailey-Brock, J.H.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT An attempt is made to list the polychaetes recorded on  
Eniwetok. A number of identified species are discussed  
in relation to habitat, population density and location.  
A total of 132 polychaete species have been identified  
on Eniwetok.  
KEYWORDS ANNELIDS/taxonomy ;ENIWETOK/baseline ecology ;ANNELIDS;  
TAXONOMY;COMPILED DATA;ENIWETOK;SITE CHARACTERIZATION;  
TABLES

EDB Item 98  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Platyhelminthes, Nemertea, and Nematoda of Enewetak  
Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Devaney, D.M.

Order number 940330-160606-96 -001-001  
page 63 set 11 with 111 of 111 items

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Except for some reports on parasitic nematodes and  
platyhelminthes in oysters, fish, and porpoises, little  
has been written about the platyhelminthes, nemertina,  
and nematoda of Enewetak Atoll. Little has been done on  
free-living nemertines or nematodes, although both  
groups must be abundant. The checklist is presented  
which gives the taxonomics of these species.  
KEYWORDS ENIWETOK/baseline ecology ; INVERTEBRATES/taxonomy ;  
NEMATODES/taxonomy ; PLATYHELMINTHS/taxonomy ; ENIWETOK ;  
INVERTEBRATES ; TAXONOMY ; NEMATODES ; PLATYHELMINTHS ; SITE  
CHARACTERIZATION

EDB Item 99  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Sipunculans and echiurans of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Devaney, D.M.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT At the present time at least 10 identified species of  
sipunculans are considered to occur at Eniwetok.  
Echiurans are previously unrecorded from Eniwetok or the  
other Marshall Islands. However, the bifurcate-tipped  
proboscis of a bonellid echiuran has been observed in  
the shallower waters of Eniwetok lagoon extending from  
beneath attached coral reef outcrops. A checklist of  
Eniwetok Sipuncula and Echiura is presented.  
KEYWORDS ENIWETOK/baseline ecology ; INVERTEBRATES/taxonomy ;  
ENIWETOK ; INVERTEBRATES ; TAXONOMY ; SITE CHARACTERIZATION

EDB Item 100  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Reef-dwelling bryozoans of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Cuffey, R.J.; Cox, R.S.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of

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Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The goals of this report are to list the bryozoans found on the modern reefs of Enewetak Atoll, illustrate the most conspicuous species, indicate their biogeographic implications, and summarize their ecology (particularly ecozonal distributions and constructional roles).  
KEYWORDS BRYOZOA/taxonomy ;ENIWETOK/baseline ecology ;BRYOZOA; TAXONOMY;COMPILED DATA;ENIWETOK;SITE CHARACTERIZATION; TABLES

EDB Item 101  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Brachiopods of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics  
AUTHOR ANALYTIC Grant, R.E.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT On Eniwetok the brachiopods are small and inconspicuous, living in cryptic habitats under the shade of coral fronds, in recesses in the reef, or on lagoon pinnacles. An attempt is made to summarize the ecology of the brachiopods and the most conspicuous species are illustrated. A checklist is included of Eniwetok brachiopods.  
KEYWORDS BRANCHIOPODS/taxonomy ;ENIWETOK/baseline ecology ; BRANCHIOPODS;TAXONOMY;COMPILED DATA;ENIWETOK;SITE CHARACTERIZATION

EDB Item 102  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Scleractinia (Stony Corals) of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics  
AUTHOR ANALYTIC Devaney, D.M.; Lang, J.C.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT Approximately 170 species in 54 genera have been identified among the 2500 stony coral specimens which were collected from 28 sites around Eniwetok Atoll.

Although the field guide is still in preparation, a provisional checklist of scleractinian corals now believed to occur at Eniwetok is presented.

KEYWORDS CORALS/taxonomy ;ENIWETOK/baseline ecology ;COMPILED DATA;CORALS;TAXONOMY;ENIWETOK;SITE CHARACTERIZATION; TABLES

EDB Item 103  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Octocorallia of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The Alcyonaceans are the most numerous octocorals represented at Eniwetok with approximately 20 species now known. A checklist of octocorallia of Eniwetok Atoll is included.  
KEYWORDS CNIDARIA/taxonomy ;ENIWETOK/baseline ecology ;CNIDARIA; TAXONOMY;ENIWETOK;SITE CHARACTERIZATION

EDB Item 104  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Sea anemones of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics  
AUTHOR ANALYTIC Cutress, C.E.; Arneson, A.C.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The sea anemones covered in this chapter were collected and/or photographed in part by Cutress during May and June 1955 and in part by Arneson from September through November 1980. Collection records are shown at the end of the chapter. Most identifications were made from preserved specimens, but a few were made from photographs alone. Available photographs of *Phymanthus strandesi* and *Physobranchia douglasi* are inadequate. *Heterodactyla hemprichi* was not photographed. No published taxonomic work on Enewetak sea anemones exists. Dunn (1981), in a revision of the clown-fish anemones, refers by catalog numbers to preserved specimens from Enewetak which she examined. Allen (1972)

refers to and illustrates seven species of host anemones that he observed at Enewetak from 1968 to 1971. Josephson (1966) made physiological observations on *Calliactis polypus*, and Johannes et al. (1972) refer to an unidentified digging anemone subsequently identified as *Actinodendron plumosum*. A checklist is provided of Enewetak sea anemones.

KEYWORDS

CNIDARIA/taxonomy ; ENIWETOK/baseline ecology ; CNIDARIA; TAXONOMY; COMPILED DATA; ENIWETOK; SITE CHARACTERIZATION

EDB Item 105

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Porifera of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Devaney, D.M.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000

ABSTRACT

The first sponges reported from Enewetak were based on collections made between 1946 and 1948 from a number of tropical Pacific areas (de Laubenfels, 1954). The Pacific Science Board of the National Research Council sponsored the collections project. Six of the 13 species recorded from Enewetak were collected by dredging near the center of the lagoon (8 km north of the south anchorage; approximately 11<sup>0</sup> 29' N, 165<sup>0</sup> 15' E, de Laubenfels, 1954) at a depth of 35 m. Another species came from the reef flat, and six were from unrecorded localities. Three new species were recorded from Enewetak, but only one (*Lissodendoryx calyptra*) was unique to that atoll. A classification checklist of Porifera at Eniwetok is included.

KEYWORDS

ENIWETOK/baseline ecology ; COMPILED DATA; ENIWETOK; SITE CHARACTERIZATION; TAXONOMY

EDB Item 106

PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2

ANALYTIC TITLE ENGLISH Recent Foraminifera and nonplanktonic protozoans

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Chave, E.H.; Devaney, D.M.

PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000  
ABSTRACT An overview is presented of foraminiferal fauna and nonplanktonic protozoans at Eniwetok from 1946-1981. A checklist is presented which identifies 280 species.

KEYWORDS ENIWETOK/baseline ecology ;PROTOZOA/taxonomy ;COMPILED DATA;ENIWETOK;PROTOZOA;TAXONOMY;SITE CHARACTERIZATION; TABLES

EDB Item 107  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Natural history of terrestrial vascular plants of Enewetak Atoll

TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2, Biogeography and systematics

AUTHOR ANALYTIC Lamberson, J.O.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P. (eds.)

CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of Scientific and Technical Information, Oak Ridge, TN

PUB. DATE (YYMMDD) 870000  
ABSTRACT Enewetak Atoll has evolved over geological time from a raised limestone island environment supporting mangrove swamps and an upland mixed forest to a low coral sand island habitat with typical strand vegetation. The 128 species of plants recorded from the atoll include many introduced weeds and ornamental or food plants, although 43% of the flora is considered to be indigenous to Micronesia. The dry, windy season from November through April causes many of the plants to drop some or all of their leaves or to die back completely. Summer-June through September - is the season of maximum plant growth and more flower and seed production. The effects of World War II and post-war military activity, the nuclear test program from 1948 to 1958, and the radiological cleanup and rehabilitation for the return of the people of Enewetak have been significant with regard to the vegetation. Many species were accidentally or intentionally introduced to the atoll, and some species have disappeared. The vegetation was greatly altered because of destruction of habitat with removal of soil and nutrients and exposure of the plants to salt spray and drying winds. Several collections and studies of the flora have been reported. This chapter describes stages in the succession of the vegetation following disturbance. The vegetation of the islands during the period 1975 to 1977 is also described in some detail.

KEYWORDS ENIWETOK/baseline ecology ;PLANTS/ecological succession ;PLANTS/taxonomy ;COMPILED DATA;ENIWETOK;NUCLEAR WEAPONS; PLANTS;TAXONOMY;SITE CHARACTERIZATION;TABLES;TERRESTRIAL

ECOSYSTEMS; TESTING

EDB Item 108  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Fungi of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Dunn, P.H.; Reynolds, D.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The microfungi of Enewetak Atoll are typical tropical  
forms and are not restricted to that atoll. Because of  
the extreme isolation of Enewetak, however, it seems  
likely that the fungi there are indigenous to the atoll  
and are not introductions by man. Whether the origin is  
terrestrial or from the beaches remains a question. The  
mycological data from Enewetak Atoll reflect two  
principles of fungal biogeography: similar regions have  
similar biotas, and distributions data are often due to  
bias collection activity of mycologists.  
KEYWORDS ENIWETOK/baseline ecology ; FUNGI/taxonomy ; COMPILED  
DATA; ENIWETOK; FUNGI; TAXONOMY; SITE CHARACTERIZATION

EDB Item 109  
PRIMARY REPORT NUMBER DOE/EV/00703--T1-Vol.2  
ANALYTIC TITLE ENGLISH Marine benthic algae of Enewetak Atoll  
TITLE ENGLISH The natural history of Enewetak Atoll: Volume 2,  
Biogeography and systematics  
AUTHOR ANALYTIC Tsuda, R.T.  
PERSONAL AUTHOR Devaney, D.M.; Reese, E.S.; Burch, B.L.; Helfrich, P.  
(eds.)  
CORPORATE TEXT Hawaii Univ. at Manoa, Honolulu (USA) ; USDOE Office of  
Scientific and Technical Information, Oak Ridge, TN  
PUB. DATE (YYMMDD) 870000  
ABSTRACT The authors present knowledge of the floristics and  
ecology of the marine benthic algae on Pacific atolls is  
based primarily on studies conducted on Enewetak Atoll.  
There are more species of marine benthic algae known  
from this atoll than are known from any other  
Indo-Pacific atoll. On the basis of the papers cited  
above, 238 species (106 genera) of marine benthic algae  
are known from Enewetak Atoll: Cyanophyta (16 species),  
Chlorophyta (89 species), Phaeophyta (24 species), and  
Rhodophyta (109 species). Nine of the species were  
described as new with the Enewetak specimens serving as



holotypes. It is interesting to note that 40 species (nine Chlorophyta, three Phaeophyta, and 28 Rhodophyta) or 16% of the species reported from Enewetak represent the only collections known from the geographic region of Micronesia. It is unlikely that these species are unique to Enewetak; further intensive collections from other areas in Micronesia will no doubt provide additional records.

KEYWORDS

ALGAE/taxonomy ;ENIWETOK/baseline ecology ;ALGAE;  
TAXONOMY;BENTHOS;ENIWETOK;SITE CHARACTERIZATION;TABLES

No data for number 490524 (item 110)

No data for number 490524 (item 110)

No data for number 489073 (item 111)

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