

**MEMORANDUM OF UNDERSTANDING
AMONG
THE UNITED STATES DEPARTMENT OF ENERGY
AND
THE GOVERNMENT OF THE REPUBLIC OF THE MARSHALL ISLANDS
AND
THE ENEWETAK/UJELANG LOCAL GOVERNMENT COUNCIL**

This Memorandum of Understanding ("MOU") is entered into among the United States Department of Energy ("DOE"), the Government of the Republic of the Marshall Islands ("RMI Government"), and the Enewetak/Ujelang Local Government Council ("Enewetak Council") (collectively the "Parties").

**Article 1
Purpose**

The purpose of this MOU is to establish a framework for cooperation among the Parties concerning the DOE's environmental and human monitoring activities at Enewetak Atoll.

**Article 2
Human Surveillance**

Whole-Body Counting

2.1 DOE will:

(1) Subject to (a) the Enewetak Council's performance of the undertakings in Articles 2.2(1)-(2) and 2.7(1), and (b) DOE's selection of qualified Enewetakese to receive whole body counting training, install at Enewetak Island a whole body counter ("WBC") and associated computer-based electronics and software (the "WBC system"). The WBC system will have a sensitivity for detecting ¹³⁷Cs body burden with a design objective having a lower limit of detection not greater than 20 nanocuries. The system will be technically equivalent to that currently installed at Rongelap Island, including: (a) a large NaI detector, (b) associated electronics (multichannel analyzer, computer, printer, etc.), (c) a background reducing shield and positioning system (e.g., shadow-shielded chair), (d) computer software programs (e.g., ABACOS), (e) whole body calibration standards, such as BOMAD, containing a NIST traceable calibration source, and (f) manufacturer specification and operating manuals.

(2) Perform the initial setup and calibration of the WBC, using appropriate phantoms and NIST traceable sources.

(3) Maintain the WBC in good operating condition, maintain quality assurance and quality control of the whole body counting data, and specify the data to be retrieved and reported.

(4) Provide to the Enewetak Council education requirements and other qualification criteria that will be used to identify two (2) Enewetak residents to undergo WBC operator training at a DOE-designated facility.

(5) Train two (2) qualified Enewetak residents for the day-to-day operation of the WBC. Operator technician training will include classroom instruction on basic principles of radioactivity, radiation detection and measurements, and practical factors training pertaining to WBC operation, daily WBC quality control (QC) checks, data collection, and record management.

(6) Pay the salaries of two technically-qualified Enewetak residents, for up to 20 hours per week each, at the rate of \$5.00 per hour, to perform whole body counting and related health physics tasks under DOE supervision and in accordance with written DOE protocols.

(7) Assist in the development of a questionnaire to be completed by persons who will undergo whole body counting.

(8) On an as-needed-basis, provide technical support or services as "troubleshooters" to WBC operator technician(s).

(9) Analyze and interpret raw WBC data (*i.e.*, body burden) and convert to annual dose and committed effective dose equivalent (CEDE).

(10) Report promptly the results of the whole body counting, in writing and in easy-to-understand terms, to the individuals concerned and, subject to the protection of those individuals' privacy, to the RMI Government and the Enewetak Council.

(11) Provide recommendations to the Enewetak Council for the frequency of WBC measurements for workers engaged in radiological remediation or for other individuals engaged in activities with significant potential for intake of ^{137}Cs .

(12) Establish an electronic WBC database that tracks individuals over time. The database will include all raw WBC data collected under this MOU, assignment of internal doses, and associated assumptions/methodologies employed. WBC records will contain a digitized photo ID of each individual tested. Individual-specific data will be disclosed to the individuals concerned (or to his/her guardian) upon those persons' written request. The electronic database will be made publicly available only subject to the protection of individuals' privacy.

(13) Participate, with reasonable advance written request from the RMI Government and/or the Enewetak Council, in periodic community or other meetings for the purpose of

keeping the RMI Government, the Enewetak Council, and Enewetak people informed of surveillance data and their implications.

(14) Submit to the Enewetak Council and the RMI Government, on an annual basis, a written report that summarizes and trends the results of WBC data.

2.2 Enewetak Council will:

(1) Conduct employment screening, using DOE-identified education and qualification criteria, that will identify two (2) Enewetak residents to undergo WBC operator training at a DOE designated facility.

(2) Pay the round-trip transportation costs between the Republic of the Marshall Islands and San Francisco, California, of the two Enewetak residents selected to undergo WBC training.

(3) Provide logistical support, on a reimbursable basis, as DOE may request and as the DOE and the Enewetak Council agree to in writing.

(4) Hire two technically-qualified Enewetak residents to staff the health physics facility (Article 2.6), and keep the facility open and staffed at least forty (40) hours per week, to permit on-request whole body counting service to the general Enewetak population and workers.

(5) Participate with DOE in developing a questionnaire to be completed by persons who will undergo whole body counting, and translate the questionnaire into Marshallese.

(6) Assist persons given whole body counts in filling out a questionnaire pertaining to diet and/or travel.

(7) Be responsible for securing licenses or approval from the RMI Government for any material/equipment required for DOE-assisted radiological monitoring and surveillance, including check-sources and calibration-sources that contain low-level radioactive materials.

(8) Assist DOE in maintaining control and custody over all low-level radioactive check/calibration sources used at Enewetak Atoll for human monitoring, environmental surveillance, and island remediation.

Plutonium Urinalysis

2.4 DOE will:

(1) Conduct plutonium urinalysis tests of 210 Enewetak residents during the term of this MOU, as follows: 50 individuals within the first 12 months following the effective date of this MOU, and 40 individuals during each of the four succeeding 12-months periods.

(2) Provide to the Enewetak Council a urine collection protocol.

(3) Report promptly the results of the plutonium urinalysis, in writing and in easy-to-understand terms, to the individuals concerned.

(4) Include the results of plutonium urinalysis in the database cited in Article 2.1(12).

(5) Provide to the Enewetak Council and the RMI Government a written report of the results of DOE's plutonium urinalysis, subject to the protection of the tested individuals' privacy.

(6) Conduct plutonium urinalysis retesting of any individual the result of whose urinalysis test conducted during the term of this MOU so warrants by reason of possible urine sample contamination, anomalous plutonium body burden measurement, or other cause.

(7) Consider conducting plutonium urinalysis testing of additional Enewetak residents where the data collected as a result of the testing conducted under Article 2.4(1) and 2.4(6) so warrant.

2.5 Enewetak Council will:

(1) Select the individuals who will undergo plutonium urinalysis tests in accordance with Article 2.4(1). Any Enewetak resident who is at least five (5) years of age may be selected to undergo plutonium urinalysis testing.

(2) Notify DOE in writing, within ninety (90) days of the effective date of this MOU, of the individuals selected for plutonium urinalysis during the ensuing 12-month period. During the remaining four-year term of the MOU, the Enewetak Council will provide such written notification to DOE within ninety (90) days following each anniversary of the effective date of the MOU.

(3) Be responsible for ensuring that individuals selected for plutonium urinalysis testing present themselves for urine collection at the scheduled time(s) and place(s) and comply with DOE's urine collection protocol.

Enewetak Island Health Physics Facility

2.6 DOE will:

(1) Provide and equip a building, at a site mutually agreed by DOE and the Enewetak Council, to house the WBC system and for urine collection, said building to be used, under DOE supervision, exclusively for the whole body counting and related health physics activities under this MOU.

(2) Provide and install a satellite telephone, with both voice and data transmission capability. DOE will pay monthly to the Enewetak Council (within 30 days of receipt of itemized bills from the Enewetak Council) for telephone calls and facsimile transmissions between the Enewetak health physics technicians and Lawrence Livermore National Laboratory.

(3) Provide and install a generator to supply the electricity needs of the facility, and provide and install meters to measure the facility's usage of water and electricity. DOE will recover the cost of the generator by offsetting against the purchase price, on a monthly basis: (a) metered electricity usage based on a rate of \$0.47 per kilowatt/hour, (b) metered water usage based on a rate of \$110.00 per 1000 gallons of water used, and (c) \$1.95 per gallon for diesel fuel used to operate the generator. Following DOE's full recovery of the purchase cost of the generator, DOE will pay the Enewetak Council, on a monthly billing basis, for metered electricity and water usage, and diesel fuel purchases at the rates set forth in this paragraph.

2.7 Enewetak Council will:

(1) Permit DOE's use, free of charge, of land on Enewetak Island to install the health physics facility.

(2) Pay charges incurred for use of the satellite telephone, other than the charges identified in Article 2.6(2).

(3) Ensure that the Enewetak health physics technicians maintain the cleanliness of the facility.

Use of Field Monitoring Instruments

2.8 DOE will:

(1) On a twelve-month trial basis, provide to the Enewetak Council two (2) micro-R field survey instruments and two (2) Geiger-Muller counters equipped with thin window "pan cake" probes (collectively herein the "field instruments").

(2) Train the Enewetak residents cited in Article 2.1(5) in the use of the field instruments and the proper interpretation of the results obtained from such use.

(3) Perform maintenance and calibration checks on the field instruments.

2.9 Enewetak Council will ensure that the field instruments are utilized only by DOE-trained persons, and are used/maintained in accordance with DOE-supplied protocols.

Article 3
Environmental Monitoring

3.1 DOE will:

(1) Complete the grid sampling characterization of Aeji and Lujor islands, and issue a report on environmental monitoring activities at Enewetak, Medren, Japtan, Anij, Aeji, Lujor, Allenbel, Lojwa, Bijire, Aomon, and Runit islands.

(2) Complete the analysis of marine samples collected in 1998 and issue a final report.

(3) Conduct, during the five-year period from the effective date of this Memorandum, two environmental monitoring missions to Runit Island. Such monitoring will consist of

(a) gathering and analysis of berm/soil, fish, and lagoon and well water samples around the Cactus Crater facility, and

(b) analysis of air, and gathering/analysis of soil samples (to a depth of five centimeters) in the Fig/Quince area.

(4) Provide a written report to the Enewetak Council on the results of DOE's environmental monitoring at Runit Island under Article 3.1(3).

Article 4
Remediation and Resettlement of Enjebi and Other Islands of Enewetak Atoll

4.1 Enewetak Council will keep DOE timely apprised of the status of the Council's deliberations concerning any plan to remediate/resettle Enjebi or other islands of Enewetak Atoll.

4.2 DOE will, upon request in connection with an Enewetak Council plan to remediate/resettle Enjebi Island or other islands of Enewetak Atoll, provide recommendations concerning soil remediation and develop a detailed radiological monitoring plan to support remediation/resettlement.

Article 5
RMI Government Undertakings

The RMI Government will:

- (1) Facilitate the grant of any licenses or other approvals for any material and equipment required for any DOE-assisted radiological monitoring, including equipment that emits low levels of ionizing radiation.
- (2) Provide DOE with reasonable advance written request(s) to participate in community or other meetings to keep the RMI Government, Enewetak Council, and the Enewetak people apprised of DOE's activities.
- (3) Provide such other assistance to DOE as the Parties may agree to in writing.

Article 6
General Conditions

6.1 The Parties will maintain close and regular communication, to ensure the effective coordination of DOE's activities at Enewetak Atoll.

6.2 The Enewetak Council will provide reasonable advance written notice to DOE of any request to participate in community meetings convened to keep the RMI Government and Enewetak community apprised of DOE's human surveillance and monitoring activities.

6.3 Any notice or other communication in connection with this MOU will be in writing. All notices, requests, and other communications under this MOU will be given to or made upon the respective Parties as follows:

If to the RMI Government:

Minister of Foreign Affairs and Trade
P.O. Box 1349
Majuro, Republic of the Marshall Islands 96960
Facsimile: 011-692-625-4979

If to the Enewetak Council:

Enewetak/Ujelang Local Government Council
Mayor Neptali Peter
P.O. Box 1199
Majuro, Republic of the Marshall Islands 96960
Facsimile: 011-692-625-3506; and

Senator Ismael John
Nitijela
Majuro, Republic of the Marshall Islands 96960
Facsimile: 011-692-625-3506

with a copy to:

Davor Z. Pevec, Esq.
Hawaii Tower, Suite 2000
745 Fort Street
Honolulu, Hawaii 96813
Facsimile: 808-599-1609

If to DOE:

Mr. Frank Hawkins
U.S. Department of Energy
Office of International Health Programs
Attn: EH-63/GTN/270 Corporate Center
19901 Germantown Road
Germantown, MD 20874-1290
Telephone: 301-903-2476
Facsimile: 301-903-1413

If to DOE's Field Operations Manager:

Mr. William D. Jackson
U.S. Department of Energy
Pacific Area Support Office
P.O. Box 29939
Honolulu, HI 96820-2339
Telephone: 808-422-9211
Facsimile: 808-422-9217

6.4 Governing law: The laws and regulations of the United States will govern this MOU, as set forth in the Compact of Free Association between the RMI Government and the United States of America and in the Federal Programs and Services Agreement concluded pursuant thereto. All questions relating to the MOU arising during its term will be settled by the Parties by mutual agreement.

6.5 It is understood that the ability of DOE to carry out its undertakings under the MOU is subject to the availability of appropriated funds.

Article 7
Commencement, Amendment, Renewal and Termination

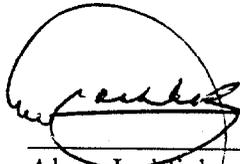
7.1 Cooperation under this MOU will commence on the date that the last signatory signs the MOU, and will continue for five (5) years.

7.2 By written agreement of the Parties, and with the concurrence of the U.S. Department of the Interior, this MOU may be amended at any time, and may be renewed for additional periods.

7.3 This MOU may be terminated by written agreement of the Parties, or may be terminated by any Party upon ninety (90) days written notice to the other Parties.

ACCEPTANCE:

Date: 8/15/00



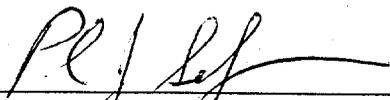
Alvin Jacklick
Minister of Foreign Affairs and Trade
Republic of the Marshall Islands

Date: 08/09/00



Neptali Peter
Mayor
Enewetak/Ujelang Local Government

Date: 8/26/00



Paul J. Seligman, M.D., M.P.H.
Deputy Assistant Secretary
for Health Studies
U.S. Department of Energy

ACKNOWLEDGED BY:

Date: 8/31/00



Danny Aranza
Director
Office of Insular Affairs
U.S. Department of the Interior