HISTORICAL SYNOPSIS

Schedule 189's and Field Task Proposals

Marshall Islands Radiological Safety Program
and Rongelap/Utirik Dose Reassessment Project
-A Historical Synopsis

[redacted]

1. personnel monitoring and environmental sampling to provide data for dose assessments and determination of radiological trends,

2. individual and population dose-equivalent assessment based on measured body burdens, retention functions, and radioactivity uptake patterns. These data will be used to modify predictive dose-equivalent commitment models so they may more adequately reflect future trends, and

3. the collection of physiologic, anthropomorphic, diet and living pattern data to apply accurate parameters to contemporary and predictive dose assessments.

Program activities in the coming fiscal year will emphasize the following:

1. in vivo counting and radiochemical analysis of biological samples for Enewetak Atoll residents,

2. in vivo counting and radiochemical analysis of biological samples for former Bikini Island residents,

3. in vivo counting and radiochemical analysis of biological samples for Marshallese comparison groups who have not subsisted from food grown on Utirik, Rongelap, Bikini or Enewetak Atolls, and

4. sampling and analysis of coconuts and coconut tree food products obtained from Enewetak.

The nuclides of primary dosimetric interest are Cs-137, Sr-90 and Pu 239-240. Personnel monitoring programs will be aimed at measuring these in the Marshallese people.

19. CONTRACTOR TASK MANAGER

[signature] Charles B. Meinhold — 03/31/81

(Signature) (Date)

20. DETAIL ATTACHMENTS: *(See instructions)*

☒ a. Facility Requirements	☒ d. Background	☐ g. Future accomplishments	☐ j. Explanation of milestones
☒ b. Publications	☒ e. Approach	☒ h. Relationships to other projects	☐ k. ZBB Detail
☒ c. Purpose	☒ f. Technical progress	☐ i. Environmental assessment	☒ l. Other (Specify):

Capital Equipment
HA-02-76

TASK REQUIREMENTS FOR OPERATING/EQUIPMENT OBLIGATIONS AND COSTS

CONTRACTOR NAME: Associated Universities, Inc.

WORK PACKAGE NUMBER	TASK NO.	REV. NO.	DATE PREPARED	CONTRACTOR NUMBER
		0	03/31/81	HP-1-EL1

21. STAFFING *(in staff years)*	PRIOR YEARS	FY 1981 BY-2	FY 1982 - BY-1 PRESIDENT'S	FY 1982 - BY-1 REVISED	AUTHORIZED	BY-FY 1983
a. SCIENTIFIC		3.2	2.8	3.8		3.8
b. OTHER DIRECT		3.1	3.7	3.7		3.7
c. TOTAL DIRECT		6.3	6.5	7.5		7.5
22. OBLIGATIONS AND COSTS *(in Thousands)*						
a. TOTAL OBLIGATIONS		385	415	623		673
b. TOTAL COSTS		385	415	580		650
23. EQUIPMENT *(in Thousands)*						
a. EQUIPMENT OBLIGATIONS		18	60	60		195
b. EQUIPMENT COSTS		51	54	54		138
24. OTHER COSTS *(specify)*						
a.						
b.						
c.						
d.						

25. OPTIONAL FIVE-YEAR PLAN *(in Thousands)* Constant BY dollars	BY-1	BY-2	BY-3	BY-4	TOTAL TO COMPLETE
a. TOTAL OPERATING OBLIGATIONS					
b. TOTAL OPERATING COSTS					
c. TOTAL EQUIPMENT OBLIGATIONS					
d. TOTAL EQUIPMENT COSTS					

26. MILESTONE SCHEDULE	PROPOSED SCHEDULE	AUTHORIZED SCHEDULE

HA-02-7

[redacted]

group which were impacted by tropospheric fallout from United States atmospheric nuclear tests in the Pacific. Its objectives are:

1. direct or indirect measurement of radionuclide body burdens,

2. measurement of the external radiation environment,

HA-02-78

[redacted]

pected progress. All work shall be conducted in conformance with generally accepted standards for R&D and other investigative or analytic procedures, as observed by universities and large independent research facilities including Brookhaven National Laboratory (BNL).

HA-02-79

[redacted]

were from former Bikini Atoll residents not counted before and the remaining spectra were from a comparison group who had never resided on Bikini Atoll.

A quality assurance program similar to that employed at Enewetak was used. Review of the historic Bikini whole-body counting data indicated no effects on body-burden assessment due to reconfiguration of the shielding and detector. Consecutive measurements of a former Bikini resident's body burden allowed computation of individual long-term biological removal rate constants. This data along with the methodology were written up and issued in a primary scientific publication.

At Kili Island there were former Bikini residents whose Cs-137 body burden remained unchanged or increased. Reasons for this nuclide being present in their current diet were investigated. This work showed that these burdens were within three standard deviations of the mean burden of the comparison population except in

20. Detail Attachments. cont.

f. Technical Progress cont.

Technical Progress in FY 1980 cont.

a few cases. Burdens elevated above this level could be attributed to recent ingestion of Bikini Atoll food which had been transported to Kili Island.

Human milk samples had been obtained from four lactating adult former Bikini females whose Cs-137 body burden had been defined by whole-body counting and radiochemical analysis of urine. Milk samples along with Bikini Island coconut tree sap and nuts were analyzed by gamma spectroscopy and atomic absorption to determine the presence of Cs-137 and K-40. Results were used to estimate the Cs-137 body burden for Marshallese infants whose primary food supply was human milk and coconut tree products.

Activity ingestion rates and future body burdens for Cs-137 were estimated for the population who may return to Enue Island, Bikini Atoll. This projection involved a determination of activity transfer factors calculated from Rongelap and Bikini whole-body counting data and from activity concentration analyses of coconut tree products. These factors were comparable for both atolls and dose-equivalent commitments were projected for adults.

Retrospective and contemporary external exposure rate data, whole-body counting data, and radiochemical analysis of urine and blood data were reviewed for the interval June 1954 to December 1980 for the Rongelapese and Utirikese. Dosimetric models which best described the uptake regime were constructed for the nuclides of interest. Daily activity ingestion rates, whole-body dose-equivalent rates and dose equivalent commitments to various organs were determined. Population dosimetry results and methods were written up and reported in a BNL publication. Individual dosimetric data records are maintained at the Laboratory.

Expected Progress in FY 1981.

Personnel monitoring and related demographic data will be obtained from residents of Rongelap, Utirik and Enewetak and other areas of interest to DOE. The data base on diet and living patterns will be updated for all relevant atolls and/or islands.

Expected Progress in FY 1982.

Evaluation of the decline of body burdens among former Bikini Island residents will continue for that portion of the population in residence on Majuro Atoll or Kili Island. Personnel monitoring will continue at Enewetak Atoll.

[redacted]

Statement (ERDA 1540).

1. Other.

Capital Equipment in FY 1983.

An intrinsic Ge(Li) whole body counting system is needed to provide more efficient and effective operation in the Marshall Islands Radiological Safety Program for counting low energy photons emitted from transuranic nuclides. This system ($150,000) and associated shielding and bed equipment ($25,000) will be used to measure body burdens of transuranic nuclides in persons at Enewetak Atoll at levels below the maximum allowable for members of the general public. Prospective dose equivalents for blood forming organs will be assessed based on these measurements.

TITLE	BUDGET AND REPORTING CODE			DATE PREPARED
Marshall Islands Radiological Safety Program	HA-02-01-02			03/31/81
CONTRACTOR NAME Associated Universities, Inc.	CODE BNL	WP NUMBER	TASK NO.	REV. NO. 0

20. Detail Attachments. cont.

1. Other cont.

Capital Equipment in FY 1983. cont.

A word processor ($20,000) for the Marshall Islands Radiological Safety Program to provide more efficient and effective operation will be needed to prepare primary scientific publications and to prepare, modify and store individual dosimetry, body burden, bioassay and demographic records on the inhabitants of the Marshall Islands included in our study. The processor will be used also in the preparation of trip reports, schedules and other administrative writing.

HA-02-83

REPOSITORY PNNL

COLLECTION Marshall Islands

BOX No. 5688

FOLDER Marshall Islands Radiological Safety Program Review 5/21-22/91

DOCUMENT DOES NOT CONTAIN ECI

Reviewed by RJ Trusso Date 4/30/97