

OAK RIDGE NATIONAL LABORATORY

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

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December 31, 1984

Mr. T. F. McGraw
Office of Health and Environmental
Research EV-30
U.S. Department of Energy
Washington, DC 20545

Dear Mr. McGraw:

Enclosed is a progress report for FTP/A ES 051 entitled, "Technical Assistance for Spain for FY 1984." We had a very productive year.

Of the \$130,000 available for FY 1984, we costed \$72,919. The remainder, I am told, is carried over to FY 1985. Part of the underrun was related to less spending than anticipated by subcontractors. We also planned to have JEN staff here in the U.S. for part of FY 1984. They are now scheduled to be here during FY 1985.

Best regards for the New Year.

Sincerely,

Chester R. Richmond ^{kd}

Chester R. Richmond
Associate Laboratory Director for
Biomedical and Environmental Sciences

CRR:kd

Enclosure

TECHNICAL ASSISTANCE FOR SPAIN

FTP/A ES051

PROGRESS REPORT FOR FY 1984

During FY 1984 we provided several kinds of assistance to the JEN staff in Madrid. We have continued our efforts to improve quality assurance aspects of the program. In FY 1982 emphasis was on obtaining radionuclide measurement internal standards. In FY 1983 we concentrated on internal dosimetry codes. Also during FY 1983 we arranged for the JEN to participate in an intercalibration activity for radiation detectors used to measure plutonium and americium in the upper torso of human subjects. Radionuclide standards of various activities were supplied with the anthropomorphic "phantom". The "chest counting" facility at the JEN is state-of-the-art and intercalibrated with other similar installations. Data from the JEN facility can now be compared with measurements made at various locations in the U.S. and the U.K. This facility may be of use in terms of DOE emergency response to certain accident conditions occurring overseas.

During FY 1984 we obtained matrix reference standards containing several transuranium elements from the National Bureau of Standards for use at the JEN. These are used in conjunction with the measurement of environmental samples. We are investigating the feasibility of having the National Bureau of Standards supply all radionuclide standards to the JEN.

I did not visit the JEN during 1984. Dr. Iranzo visited the Oak Ridge National Laboratory for several days following his participation in the June meeting of the Health Physics Society in New Orleans. Dr. Iranzo presented a paper at that meeting on the exposure of several groups of Palomares residents to plutonium in air for the 15-year period following 1966. This was the first presentation of data from Palomares to a large technical meeting by a member of the JEN staff. We translated the original paper from Spanish to English,

prepared an abstract and slides, and worked with the program committee to get the presentation on the meeting agenda.

We also provided technical assistance to Dr. Iranzo in preparing the annual proposal to the Department of Energy and in developing programmatic direction for the year.

We prepared a supplement to a major report entitled "Radioactivity in Food Crops," (ORNL-5963). This report and the supplement allows one to identify from tables the kinds and amounts of radioactivity in food crops from many locations around the world. The purpose of the report is to provide "baseline" data for comparison with measured contamination in food crops at Palomares. Emphasis is on alpha-emitting radionuclides.

I also participated in a January, 1984, meeting on "Criteria for Cleanup of Transuramium Elements in Soil," that was sponsored jointly by the DOE Assistant Secretary for Defense Programs and the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness (Office of Nuclear Safety). As part of that effort, I served as a member of a task group which DOE convened to review the EPA draft report on "Dose Limits for Persons Exposed to Transuranium Elements in the General Environment-1984."

We have concluded discussions with Dr. Iranzo on the assignment of JEN staff to DOE contractor laboratories for periods of 2 to 3 months. One person will work on internal dosimetry problems and will learn and apply new experimental and analytical techniques and computer models to research activities at the JEN. Another will concentrate on chemical speciation and particle size measurements in soil. Both will start their assignments to ORNL in February, 1985. We expect another person will spend 3 months later in the year working on the collection and measurement of particles in air at the DOE Environmental Measurements Laboratory (EML) in New York City.

P. N. Dean of the Lawrence Livermore National Laboratory visited the JEN during FY 1984 at our request. A 16-detector alpha spectrometer system was added to the counting room at the JEN in Madrid. The device utilizes silicon surface-barrier detectors capable of high resolution measurement of alpha particles from plutonium and americium. The detector system will be used for the assay of ^{239}Pu and ^{241}Am in environmental samples obtained from Palomares. This system also includes a pulse height analyzer which allows for the simultaneous use of all 16 detectors.

An LSI-11/23+ computer system was also installed at the JEN to permit the online analysis of data obtained from the counting system mentioned above. This computer is interfaced to the pulse height analyzer and exerts complete control over it. The computer is used to initiate and terminate data acquisition and to store accumulated data on floppy magnetic disks.

The total of 12 computer programs was written for the control of data acquisition obtained from the pulse height analyzer for data analysis. Separate programs are used for the analysis of data obtained from soil, animal tissue, air, vegetation and urine. Provision is made for the use of either ^{236}Pu or ^{242}Pu as the internal standard and for a change in the calibration at any time. These analyses can be performed immediately after the data are acquired.

We also provided Dr. Iranzo with numerous articles concerning the measurement and detection of actinide elements in the environment and on instrumentation related to the detection of actinide radionuclides. We also provided the JEN with information on procedures for measuring particle size of particulates in air and in soil. In addition we provided, at their request, information concerning the emission of radioactive materials from coal-fired power stations, because the JEN is also responsible for developing energy producing systems other than those based on nuclear fission.

My advisory group for this activity did not meet during FY 1984. We do plan to meet during FY 85, and I have invited Dr. Iranzo to participate in either the spring or fall of 1985 probably at the Oak Ridge National Laboratory.

CRP Richard