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ENVIRONMENTAL HEALTH PROGRAM ACTIVITIES - MSC

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The Kelsey-Seybold Clinic of Houston, Texas, is responsible for our Medical Support Services Contract. We have just begun the second three-year period with their personnel and expect it to be the best to date, having had three prior years of experience.

There is presently a full staff complement of 50 to cover six rather diversified program areas:

Occupational Medicine

Occupational Medicine Dispensary
Medical Operations Testing Support
Cardiopulmonary Laboratory

Environmental Health

Industrial Hygiene
Spacecraft Sanitation
Radiological Health

I will now speak more directly to the Environmental Health portion:

Industrial Hygiene

A condensed summary of industrial hygiene activities for the contract year, October 1, 1968, through September 30, 1969, includes the following. Investigations, including detailed studies, of reported hazardous conditions comprised a total of 219 field visits, of which 63 were self-initiated. Examples of items investigated are toxic air-contaminants, excessive noise, poor lighting, food sanitation, water pollution, and exposure to nonionizing radiation such as microwave and ultraviolet light. A total of 1,295 field determinations were made and 1,065 samples were submitted for laboratory analysis. Advisory services are provided for the preparation of criteria, designs, and specifications for facilities where toxic or potentially health hazardous agents are involved.

Several special projects were accomplished. Examples of such projects include the following: Talks were prepared and presented for the Basic Radiological Health Course given at Ellington Air Force Base; for the

Industrial Medical Association Seminar held at the downtown Kelsey-Seybold Clinic, and the Educational Conference of the National Association of Sanitarians; a one-hour training course regarding mercury hazards was prepared and sessions presented; health hazard bulletins were completed on beryllium, benzene, carbon monoxide, formaldehyde, propellants and oxidizers, cross-connections, and sulfur dioxide; a written procedure for collecting "Type B" breathing air samples was prepared; a proposed MSCI Management Instruction entitled "Laser Hazards - Policies and Procedures for Personnel Protection" was developed and submitted for review and comment.

Members of the staff attended a number of professional activities including a variety of short courses. Included were the annual Industrial Hygiene Conference held in Denver, Colorado; a Sanitarian's Seminar held in Fort Worth, Texas; a short course in Advanced Methods for Water-Pollution Analysis given at the University of Houston; and a short course on Pesticides and Public Health given at the Communicable Disease Center of the U. S. Public Health Service. It is felt that these and the other professional activities attended were of significant value to our industrial hygiene program.

Radiological Health

The Health Physics' staff was requested to provide the Radiological Safety Officer for MSC under terms of their NASA contract.

A radiological health manual for MSC operation was prepared and presented to the MSC Radiation Safety Committee and various interested individuals for comment. After incorporation of the comments received, the manual was approved by the MSC Radiation Safety Committee and the Director of Medical Research and Operations, to provide guidance to personnel, both NASA and contractor, in the procurement and safe handling of radioactive material or radiation producing equipment at MSC.

Employee development was stressed in the Health Physics staff during the past year. Some of the formal training received by members of the staff was the USPHS courses, "Basic Radiological Health," "Occupational Radiation Protection," and "Accelerator Radiation Protection."

Effort in Space Radiation Dosimetry, supporting the Radiological Health Team, commenced in May 1969. It is the goal of Space Radiation Dosimetry to evaluate radiation exposures to astronauts in light of medical responses which may influence the general well-being of the flight crew or the ultimate success of a manned spacecraft mission.

Activities to date in Space Radiation Dosimetry have fallen in three basic categories: pre-mission planning and dose estimation, real-time dosimetry at the Space Environment Console, and postflight dose evaluation. Real-time support was given during the Apollo 10 and 11 missions. Radiation dose to the crews of these missions was nominal and medically insignificant. Postflight evaluations of these missions did uncover a number of shortcomings in dosimetry techniques, however. As a result, a new dosimeter system (for neutron detection), has been designed by Space Radiation Dosimetry and will be flown on Apollo 12. A portion of the neutron system was tested on Apollo 11.

Spacecraft Sanitation

The spacecraft sanitation function was incorporated into the contract on October 1, 1968, with the responsibility for accomplishing spacecraft potable water and waste management and personal hygiene support.

During the report period, Apollo 7 through 11 manned spaceflights, and altitude chamber tests in support of the missions were documented. In an effort to obtain information regarding the significance of microbiological and chemical analyses of spacecraft potable water, considerable time was spent searching literature pertinent to the Apollo program. A similar effort was conducted with regard to potential or anticipated problems connected with Apollo Applications and Advanced Mission Programs. These problems involve the use of additives, such as corrosion inhibitors, trace metallic ions, and bactericidal agents. A study was initiated on "Closed Ecological Systems" in anticipation of future research efforts in potable water and waste management and personal hygiene. The Apollo Water Sampling Device was developed and tested in support of preflight and postflight potable water collection from the spacecraft.

A major part of the overall goal was the development of a water analysis laboratory, an essential adjunct to the success of the effort. Monitoring of the chemical and microbiological quality of the potable water for manned space flights and altitude chamber tests will be conducted by the laboratory. The laboratory will contribute to future research efforts in Spacecraft Sanitation.

The last section is the Environmental Health Services Laboratory which was designed to function primarily in the areas of industrial hygiene and spacecraft sanitation, and as such, has assumed responsibilities for developing, evaluating, coordinating, and documenting test and

sampling procedures for the analytical chemistry and microbial analyses of air, water, food, drugs, and biological specimens. More specifically, the laboratory is monitoring adulteration and pollution of air and water by means of physical, chemical, and microbial analyses.

During the past year, the laboratory has been in the process of being remodeled to provide additional space for the following instruments which have been received and will be installed upon completion of the construction work: infrared spectrophotometer, atomic absorption spectrophotometer, ultraviolet and visible spectrophotometer, refractometer, tensiometer, conductivity monitor, Super-Q water system (Millipore), and semi-micro analytical balance. The instrumentation mentioned here is in addition to the gas chromatograph which was acquired approximately a year earlier. Although many of the procedures for the analyses are outlined in U. S. Public Health and/or NASA specifications, the ability to up-date and expand these and other analytical techniques will be emphasized in the operation of the laboratory.