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Space Medicine Branch Report

Occupational medicine and environmental health services to help prepare KSC for Space Shuttle launch

The John F. Kennedy Space Center shares over 140,000 acres of subtropical marsh, hammock, inland lagoon, and Atlantic seashore congruently with the Merrit Island National Wildlife Refuge, the Cape Canaveral National Seashore, and the U.S. Air Force Eastern Space and Missile Center on Florida's prominent east coast cape. It is in this setting that the U.S. National Aeronautics and Space Administration has established its prime launch facility. From here, all of U.S. manned space missions and the great majority of our unmanned satellites have been launched. These ventures, often taken for granted—or even forgotten by some—took place because a veritable infantry division of people from local cities and communities pursued myriads of mundane and exotic tasks amid unique buildings, structures, and wildlife.

Activity over the past 2 years has mounted progressively toward a special moment now viewed by the whole world with expectation. The launch of this nation's first reusable space vehicle should occur in the first half of 1981. One major element contributing to its preparation and ultimate launch is the Occupational Medicine and Environmental Health Services under the auspices of the KSC Biomedical Office. The role of occupational medicine and environmental health in providing emergency medical coverage and monitoring of hazardous conditions and substances during actual launch countdown operations is easily understood. However, the routine day-to-day medical support of 14,000 workers is perhaps less visible.

These essential activities are directed from the third floor corner of a building known as the O&C (Operations and Checkout). Under the directorship of Paul Buchanan, M.D., an integrated civil service and contractor team furnishes expertise in medicine, occupational health, environmental surveillance, and life sciences. Three medical facilities, industrial hygiene and health physics laboratories, a fleet of ambulances, a helicopter dedicated to medical evacuation of patients, and clinical and research laboratories form the principal worksites. However, quite literally, the whole center is the working stage for monitoring and surveillance teams who frequent the Orbiter Processing Facility, the Vehicle Assembly Building, the Launch Complex 39, engineering and test sites, cafeterias, waste management systems, and the natural habitats of wildlife species, from bald eagles to manatee.

Uppermost in the minds of all space workers is the assurance of a safe and successful mission. Therefore, our astronaut crews are recipients of special medical care whenever they are in residence at KSC. This includes health concerns within their crew quarters (al-

so located in the O&C Building) and implementation of a program to minimize their contact with communicable diseases during the week preceding launch. Although their total medical care is the responsibility of the Medical Sciences Division of the Johnson Space Center, elements of routine pre- and postflight medical evaluations, the flight biomedical monitoring system, assurance of onsite emergency medical services, and of definitive medical care facilities have been delegated to the KSC Biomedical Office. These latter two provisions entail liaison, negotiations, training, and cooperative effort with medical components of the Department of Defense and with local and regional hospitals.

For the many support and service personnel at KSC, both permanent and temporary, the Biomedical Office provides required job placement and certification examinations, periodic surveillance where hazardous work conditions warrant it, and around-the-clock, seven-days-a-week emergency medical service for both occupational and non-occupational injuries and illnesses. The occupational environment at KSC is potentially quite hazardous from mechanical, thermal, chemical, and radioactive elements.

Several examples illustrate the spectrum of the hazards. High crew and steel workers refurbish and maintain the elaborate launch towers. Any outside activity in Florida exposes the worker to high heat loads much of the year. This may be particularly critical for an employee suited in a Self-Contained Atmospheric Protective Ensemble (SCAPE suit) for work involving toxic and hypergolic fuels. Some of these fuels are highly noxious upon contact with any living tissue. The Space Transportation System (STS) contains a variety of fuels, including hydrazine and nitrogen tetroxide. Ionizing radiation is present in both support equipment and certain Shuttle payloads. Laser and radio frequency emissions are also encountered in many essential operations. Assuring worker health and safety amidst these conditions demands constant vigil.

On the other side of the medical ledger, all those diseases and illnesses common to man wherever he resides also appear in the KSC work force and must be dealt with. An Employee Assistance Program offers help to any troubled employee, including those suffering from alcohol or drug abuse or inordinate stresses compounded in this unconventional, but conforming, society.

To round out biological concerns at KSC, the local biosphere itself is at risk. Flora, fauna, fowl, and fish—many of them rare and endangered species—may be subjected to toxic wastes from industrial processes or the ef-

fluent fallout from Shuttle engine exhausts. A program of baseline monitoring has been conducted over the past several years in order to detect adverse and/or cumulative effects of multiple STS launches in the unfolding decade. This bears also on the atmosphere, water, and land of this unique natural and national resource. Wastes, pollution (even sonic booms), non-renewable resources, and the temptation for space exploitation must be addressed in a total ecological perspective.

Space medicine at KSC is truly a lesson on life and all its ramifications. Flight medicine and occupational medicine meld here toward an indistinguishable entity. Problems remain, but they are being met with solutions.

G. Wyckliffe Hoffer, M.D.
 NASA Kennedy Space Center

Mohler heads career study of space medicine

Over the last few months, I have been repeatedly contacted by physicians, students, and professional organizations expressing interest in information on training and career opportunities in space medicine. With this renewed interest in the space program, I believe the time has come to aggressively publicize the activities of our branch, both within and outside AsMA, and to better define the role our specialty will be playing in the field of medicine over the next two decades.

There is undoubtedly a need to revise and consolidate a Space Medicine Branch charter to address the above subjects. Therefore, I have asked Stanley Mohler, M.D., Professor, Department of Community Medicine, and Chairman, Aerospace Medicine Residency Training Program at the Wright State University, Dayton, OH, to initiate a survey of career opportunities in space medicine and to develop a brochure for our branch. Dr. Mohler graciously accepted. I believe that this endeavor will lead to a definition of the space medicine field as a whole, an outline of career opportunities in the U.S. and abroad, and a definition of the training requirements for a career in space medicine.

I hope that the members of the Space Medicine Branch will take an interest in this project and provide Dr. Mohler or me with their suggestions and ideas. A progress report will be made at the Annual Meeting of the Space Medicine Branch on May 6, 1981, in San Antonio, TX.

Arnauld Nicogossian, M.D.
 President, Space Medicine Branch