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Medical Command

RADIATION PROTECTION PROGRAM

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This instruction implements AFI 40-201, *Managing Radioactive Materials in the USAF*, AFI 48-148, *Ionizing Radiation Protection*, AFOSHSTD 48-139, *Laser Radiation Protection*, and AFOSHSTD 48-9, *Radio Frequency Radiation Protection*. This instruction details policy and procedural requirements of the 45th Space Wing Radiation Protection Program. Approval and coordination procedures are established and direction is provided for the proper control of radiation sources, excluding disaster control operations. This document applies to all organizational elements under 45th Space Wing jurisdiction or direction, including contractors, tenants, and visitors.

SUMMARY OF REVISIONS

This revision clarifies certain procedures and requirements, updates regulatory and organizational references, and deletes extensive material duplicated in higher Air Force instructions. This revision also incorporates 45SWI48-103, As Low As Reasonably Achievable (ALARA) procedures into this document.

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1. General Description.

1.1. Policy. At any location or facility under the purview of the 45th Space Wing, centralized control will be exercised over the use of devices and sources capable of producing radiation to ensure radiation exposure is as low as reasonably achievable (ALARA). This will be done to safeguard the health of the military and civilian populations. All activities involving the use of sources of radiation shall be conducted in such a manner as to conform to all pertinent Federal, State, and local instructions and controls. Personnel exposures will not be permitted to exceed applicable Federal or State regulatory limits except in the event of an extreme emergency, as defined by those instructions and controls. The 45th Space Wing Radiation Protection Program has been established to implement and maintain this policy. **Attachment 1** details the 45th Space Wing ALARA policy.

1.2. Scope. This instruction defines requirements regarding the introduction and use of sources and devices capable of producing radiation, and describes the basic organization and responsibilities of the 45th Space Wing Radiation Protection Program as they pertain to personnel health protection and regulatory compliance. It does not address reviews and approvals related to frequency authorization. Frequency authorization is the purview the 45th Space Wing Frequency Manager.

1.3. Applicability. This instruction applies to all organizational elements under 45th Space Wing jurisdiction or direction, including associated contractors, tenants, transients, principal investigators, and visitors. It expressly concerns personnel directly involved with management, procurement, surveillance, and use of materials, machines, devices or sources producing any type of radiation.

2. Program Responsibilities.

2.1. The 45th Space Wing Radiation Protection Officer.

2.1.1. Represent the 45th Space Wing on matters of policy and procedures related specifically to control of radiation sources on the Eastern Range.

2.1.2. Evaluate, make recommendations, and provide general surveillance over the 45th Space Wing Radiation Protection Program to ensure compliance with regulatory agency requirements relative to all radiation activities.

2.1.3. Audit the recordkeeping systems of the 45th Space Wing Radiation Protection Program to ensure compliance with regulating agency requirements for licenses, registrations, reports, and records.

2.1.4. Provide technical guidance on radiological matters.

2.1.5. Provide technical direction to the Joint Base Operations Support Contactor (JBOSC) Health Physics Office in fulfilling their responsibilities to the extent that the Contracting Officer delegates technical management authority to the 45th Space Wing Radiation Protection Officer.

2.1.6. Ensure proper disposition of radiation exposure records for all government employees, both military and civilian, annually and upon transfer or termination of employment.

2.1.7. Assume technical control, initiates investigations, and directs corrective action in radiological incidents and emergencies.

2.1.8. Ensure coordination with 45th Space Wing Safety Officer on all operations and incidents associated with launch processing areas and areas where ordnance, toxic materials, cryogenics or other hazards may affect radiological operations.

2.2. Bioenvironmental Engineer. Act in the absence of the 45th Space Wing Radiation Protection Officer.

2.3. Joint Base Operations Support Contractor (JBOSC) Health Physics Office. In accordance with the terms of its contract and as specified in the JBOSC Statement of Work, is functionally responsible to:

2.3.1. Operationally implement the 45th Space Wing Radiation Protection Program at Cape Canaveral AFS (CCAFS) and other locations under the direction of the 45th Space Wing Radiation Protection Officer.

2.3.2. Evaluate, make recommendations, and provide technical assistance to the 45th Space Wing Radiation Protection Officer on matters concerning radiation protection.

2.3.3. Act as field representative for the 45th Space Wing Radiation Protection Officer and liaison between user organizations and the 45th Space Wing Radiation Protection Officer on matters concerning radiation protection.

2.3.4. Perform on-site surveillance and inspections of radiation users, use areas, operations, and facilities.

2.3.5. Maintain licenses and registrations for CCAFS together with associated records and reports in compliance with regulating agency publications and provide general surveillance functions for the 45th Space Wing Radiation Protection Officer.

2.3.6. Provide technical evaluations and other assistance to the 45th Space Wing Radiation Protection Officer on matters concerning radiation protection.

2.3.7. Provide health physics services and consultation to 45th Space Wing and to the users at CCAFS.

2.3.8. Advise the CCAFS Fire Department of locations on CCAFS where hazards to personnel may be created as a result of a fire involving radioactive materials.

2.4. Safety Officer. Ensures radiation control requirements are incorporated into the overall hazard control of booster/payload systems. In these capacities, the Safety Officer will:

2.4.1. Review and approve procedures which involve missile-related hazards in conjunction with radiological hazards.

2.4.2. Coordinate all identified plans, procedures, etc., involving radiological activities with the 45th Space Wing Radiation Protection Officer.

2.4.3. Ensure the enforcement, as applicable, in coordination with the 45th Space Wing Radiation Protection Officer, of all such requirements, directives, and adjunct controls established by the 45th Space Wing Radiation Protection Officer.

2.4.4. Provide consultation to the 45th Space Wing Radiation Protection Officer and the JBOSC Health Physics Office on all safety problems associated with operations, to include equipment and personnel, involving radiological matters.

2.5. Supply Officer. Ensure that the 45th Space Wing Radiation Protection Officer has approved all procurement requests for material and equipment that produce or contain sources of radiation. Ensure that all material and equipment that produces or contains sources of radiation that has been turned in

for excess or redistribution has been approved by the 45th Space Wing Radiation Protection Officer for such disposition.

2.6. Contracting Officer. Incorporate the applicability of this instruction in all Requests for Proposals and Invitations for Bid, to include requests for equipment, materials, and services. Ensure that existing contracts administered by the 45th Space Wing include the applicability of this instruction including a requirement that all contractors holding Agreement State licenses apply for and obtain an approved NRC Form 241 before bringing radioactive materials onto the installation.

2.7. Transportation Officer.

2.7.1. Ensure that all outbound shipments of radioactive materials comply with applicable directives and have been approved for shipment by the 45th Space Wing Radiation Protection Officer or the JBOSC Health Physics Office.

2.7.2. Ensure that receipts of radioactive materials are identified to, and that approvals are received from, the 45th Space Wing Radiation Protection Officer or the JBOSC Health Physics Office for disposition.

2.8. Civil Engineering. Ensure that the 45th Space Wing Radiation Protection Officer approves requests for construction or modification of facilities or systems in which radiation sources are intended to be stored, tested, or used.

2.9. Organizations Supervisors.

2.9.1. Ensure that all radiological operations under their control have been approved by the 45th Space Wing Radiation Protection Officer and comply with the applicable requirements of the 45th Space Wing Radiation Protection Program. Procedures for submitting appropriate Radiation Use Request/Authorization forms and obtaining approval are detailed in paragraph 4.5., 5.4., and 6.4.

2.9.2. Ensure that all personnel under their supervision who are involved in the use of sources of radiation have been approved by the 45th Space Wing Radiation Protection Officer and have been trained in the use of, and personnel protection practices for, such operations.

2.9.3. Appoint an Area Radiation Officer to act as the coordinating point of contact of all 45th Space Wing Radiation Protection Program requirements relative to their approved operations.

2.9.4. Ensure the safe use and accountability of all sources of radiation under their jurisdiction according to the provisions specified by the 45th Space Wing Radiation Protection Officer.

2.9.5. Immediately notify the JBOSC Health Physics Office in the event of any accident or incident involving a potential overexposure of personnel at CCAFS. Notify the 45th Space Wing Radiation Protection Officer of accidents or incidents occurring at PAFB, or downrange locations.

2.10. User. Observe applicable provisions of this instruction and those provisions and procedures as stated in the approved Radiation Use Authorization.

3. Administrative Provisions For Control of Sources of Radiation.

3.1. General Provisions. Exposure to personnel from sources of radiation that are controlled or regulated by the provisions of the 45th Space Wing Radiation Protection Program will be restricted to levels as low as reasonably achievable (ALARA). In order to achieve those goals, all personnel involved in operations that entail the use of sources of radiation must ensure that all such operations conform to

the provisions and requirements described herein and any additional provisions imposed by the 45th Space Wing Radiation Protection Officer. The following general provisions are provided to assist users of radiation sources under the purview of the 45th Space Wing Radiation Protection Program.

3.1.1. All proposed procurement and use of radiation sources will be submitted to the 45th Space Wing Radiation Protection Officer for review and approval prior to such proposed procurement and use.

3.1.2. Procedures for submitting appropriate Radiation Use Request/Authorization forms to the 45th Space Wing Radiation Protection Officer for authorization of radiation sources are detailed in paragraph 4.5., 5.4., and 6.4.

3.1.3. In some instances, radiation sources may be exempt from 45th Space Wing Radiation Protection Program control requirements. Questions regarding exempt status of a specific source of radiation that the user cannot otherwise determine may be addressed by submitting the appropriate Radiation Use Request/Authorization forms.

3.1.4. All receipt, internal transfer, disposition and shipment of radiation sources will be coordinated with and approved in advance by the 45th Space Wing Radiation Protection Officer. Wing program/project leaders and technical representatives will review project plans and procedures involving use of radioactive material or radiation producing devices to ensure such coordination and approval.

3.1.5. The 45th Space Wing Radiation Protection Officer will maintain applicable records pertaining to the 45th Space Wing Radiation Protection Program. Such records will include, but not necessarily be limited to, records of procurement, receipt, use authorization, exemption, licensing, inventory, survey, dosimetry, disposal, shipment, and investigations.

3.1.6. Personnel who enter a designated ionizing radiation area will be appropriately monitored to quantify all radiation exposures.

3.1.7. The KSC Radiation Protection Officer must also approve sources stored or used on Kennedy Space Center (KSC) by organizations under CCAFS purview. This approval is accomplished by concurrence signature of the KSC Radiation Protection Officer on the appropriate Radiation Use Request/Authorization form. This coordination is performed by the 45th Space Wing Radiation Protection Officer or designee and does not require separate submittals to the KSC Radiation Protection Officer by the user organization.

3.2. Specific Provisions. Specific provisions and guidelines are provided to assist prospective users in complying with 45th Space Wing Radiation Protection Program requirements. Compliance with these provisions, in addition to any specific restriction or constraints imposed in the applicable Radiation Use Authorization, is required for continued authorization of use.

3.2.1. All procurement requests for equipment or devices capable of producing hazardous levels of ionizing or nonionizing radiation must be accompanied by a statement or signature of approval from the 45th Space Wing Radiation Protection Officer.

3.2.2. Radiation use authorization for possession and use of radiation sources requires the review and approval of the 45th Space Wing Radiation Protection Officer. For authorizations, submittal of a completed Radiation Use Request/Authorization package is required. These forms, in conjunction with any necessary supportive data, shall be submitted as soon as practicable and should be provided 30 days prior to the intended arrival of the sources on the Eastern Range.

3.2.3. A Radiation Use Authorization may be issued upon evaluation of the Radiation Use Request/Authorization form and related information. Preoperational source data including use and emergency procedures, site and area plans, qualifications of users and Area Radiation Officers and equipment characteristics should be submitted to the 45th Space Wing Radiation Protection Officer by those who intend to operate or utilize a source of ionizing/nonionizing radiation source no later than 30 days prior to planned operation or as soon as practical.

3.2.4. Under certain circumstances, a General Use Authorization may be issued in response to the Radiation Use Request/Authorization submittal for sources that present a minimal hazard potential to personnel. Use of sources under general authorizations will still be subject to specific controls or restrictions as required. General use authorizations will normally be issued for indefinite periods of time.

3.2.5. Prior to utilizing radiation sources, individuals must possess current medical clearance (as applicable), pertinent experience, understanding of the limiting provisions of the Radiation Use Authorization, and have received training or orientation covering at least the following topics:

3.2.5.1. General description of radiation and associated biological effects.

3.2.5.2. Basic principles of radiation protection.

3.2.5.3. Radiation protection procedures relevant to intended use.

3.2.5.4. Provisions of this instruction and appropriate Federal, State, and local directives.

3.2.5.5. Emergency procedures appropriate to source use.

3.2.6. Due to the nature of work to be performed, personnel subject to unusual radiation hazards may be required to obtain additional training as determined by the 45th Space Wing Radiation Protection Officer. All potential users will supply the necessary information on 45 SW Form 2256, **Radiation Training and Experience Summary (Ionizing Radiation)**, or 45 SW Form 2257, **Radiation Training and Experience Summary (Nonionizing Radiation)**.

3.2.7. The 45th Space Wing Radiation Protection Officer will evaluate each radiation use request submittal to determine which sources are capable of producing potentially hazardous levels of radiation. Additional information and site inspections or surveys may be utilized in the course of analysis and evaluation.

3.2.8. Based on the preliminary evaluation of a radiation use request submittal, an initial comprehensive survey may be required and will be conducted by the 45th Space Wing Radiation Protection Officer, or designee, prior to or in conjunction with, initial use. Periodically, routine surveys will be conducted to ensure continued compliance with stated procedures and controls, as applicable.

3.2.9. The fundamental objective behind all radiological controls is to limit potentially hazardous exposures to personnel. In addition to complying with applicable Federal, State and local directives, applicable exposure limits and radiation protection guides, an individual radiation use request submittal may have additional controls assigned by the 45th Space Wing Radiation Protection Officer because of unique operational characteristics.

3.2.10. Due to the potential hazard level of some systems and devices, organizations responsible for their use may be required to schedule their activities through the 45th Space Wing Radiation Protection Officer or to provide other prior notification of operations. These requirements will be

specified in the approved Radiation Use Authorization. Radiation support requirements for activities involving hazardous radiation sources may be specified in the approved Radiation Use Authorization. The user shall ensure that all such requirements are included in the support-required section of the Scheduling System. If advance notification is required, the user will ensure a minimum of 24 hours advance notification to the Cape Support Coordinator.

3.2.11. The 45th Space Wing Radiation Protection Officer must approve modifications to approved Radiation Use Authorizations in advance. This approval process may be initiated by submittal of 45 SW Form 2260, **Modification of Radiation Use Authorization**, to the 45th Space Wing Radiation Protection Officer, or designee as soon as practicable but in no case later than 30 days prior to implementation. Examples of modifications include changes to approved procedures, locations, operating parameters, personnel and equipment.

3.2.12. Radiation Use Authorizations will expire 1 year from their effective date if requests for renewal are not submitted to the 45th Space Wing Radiation Protection Officer for extension of the use period. Renewal requests will be submitted by the user on a completed 45 SW Form 2260, **Modification of Radiation Use Authorization** as soon as practicable, but in no case later than 30 days prior to expiration of the Radiation Use Authorization.

3.3. Incidents, Accidents and Emergencies. All real or suspected accidents, incidents, or emergencies involving potential radiation exposure, or loss or theft of radiation sources, must immediately be reported to the 45th Space Wing Radiation Protection Officer or designated representative.

4. Control Provisions and Guidelines for Sources of Ionizing Radiation.

4.1. General Provisions. Procurement, possession, and use of sources of ionizing radiation require prior coordination and approval by the 45th Space Wing Radiation Protection Officer. Because of the unique nature of certain radiation sources, regulatory agencies outside of the 45th Space Wing may require authorization or registration of such sources or intended use location in addition to 45th Space Wing approvals. The provisions and guidelines in this chapter are provided to assist users in their effort to comply with the requirements as well as those of other regulatory agencies as they apply to operations on the Eastern Range.

4.2. Licensing. Appropriate licenses issued by the United States Nuclear Regulatory Commission (USNRC) or State of Florida are generally required for possession and use of licensable quantities or concentrations of radioactive materials on pertinent areas of the Eastern Range. In some cases, reciprocal recognition of other Agreement States licenses may be sufficient for possession. For material in the possession of Air Force organizations, a permit from the Air Force Radioisotope Committee may be required. Copies of all licenses and reciprocal authorizations must be provided to the 45th Space Wing Radiation Protection Officer for review prior to approving source use.

4.3. Registration. Certain radiation producing machines or devices may require specific registration by the State of Florida on pertinent areas of the Eastern Range. Copies of all such registrations must be provided to the 45th Space Wing Radiation Protection Officer as part of the data submission required for approval of radiation producing machines or devices.

4.4. The 45th Space Wing Required Authorization/Provisions for Use of Sources of Ionizing Radiation.

4.4.1. A license, registration, reciprocal authorization or petitioned exemption issued by the Air Force Radioisotope Committee, USNRC, an Agreement State, or a nonagreement State to an indi-

vidual or organization is not valid on the Eastern Range until 45th Space Wing approval has been obtained. Any organization or individual functioning under 45th Space Wing jurisdiction proposing to procure, use, store, transfer; or dispose of radiation sources must obtain radiation use authorization from the 45th Space Wing Radiation Protection Officer.

4.4.2. Radiation use authorization is required (unless specifically exempted by the 45th Space Wing Radiation Protection Officer) for:

4.4.2.1. By-product, source, or special nuclear material.

4.4.2.2. Naturally occurring radioactive material in any form other than or in a quantity or concentration greater than, that found in the natural environment.

4.4.2.3. Accelerator-produced radioisotopes.

4.4.2.4. Generally licensed items or devices acquired under the general license provisions of Title 10, Code of Federal Regulations (CFR), or issued under the provisions of an Agreement or Non-Agreement State.

4.4.2.5. Machines/devices primarily designed to produce ionizing radiation, or for which ionizing radiation is a by-product of their operation.

4.4.3. Prior written authorization to use or transport radioactive materials or radiation-producing devices on the Eastern Range must be obtained from the 45th Space Wing Radiation Protection Officer. This applies to activities that involve the acquisition, possession, use, storage, and transfer or disposal of such radiation sources. No operation or modification to an existing operation will be implemented prior to issuance of a Radiation Use Authorization.

4.4.4. Radiation use authorization of storage and use areas and facilities will be obtained prior to commencing initial operations.

4.4.5. Individual users and use organizations shall ensure accountability for their sources and coordinate this effort with the 45th Space Wing Radiation Protection Officer.

4.4.6. Radiation-controlled areas and exclusion areas described by the applicable Radiation Use Authorization will be posted and controlled by the user.

4.4.7. All personnel exposure to radiation sources will be kept as low as reasonably achievable (ALARA).

4.4.8. Any radioactive materials or radiation-producing devices improperly transported onto the Eastern Range will be subject to impoundment until either the irregularities are corrected and appropriate authorizations are obtained or proper removal from the Range is arranged.

4.4.9. Unattended sources of radiation will be secured against unauthorized access and handling at all times.

4.4.10. Users must have a medical clearance (as appropriate) and be properly trained for work involving radiation sources.

4.4.11. Personnel who enter a radiation area must wear an appropriate dosimeter device specified and be approved by the 45th Space Wing Radiation Protection Officer.

4.4.12. All real or suspected incidents or accidents, unusual occurrences and excessive exposures involving or resulting from sources of radiation must immediately be reported to the 45th Space Wing Radiation Protection Officer.

4.4.13. Noncompliance with 45th Space Wing Radiation Protection Program requirements relative to the authorized use of radiation sources may result in the revocation or suspension of such radiation use authorizations, and possible impoundment of sources.

4.5. Data Submittals and Approvals.

4.5.1. Radiation use authorization for the possession or use of ionizing radiation sources requires submittal of the appropriate completed 45th Space Wing Radiation Protection Program forms for the type of sources along with any necessary supportive data.

4.5.2. Submittals must be made as soon as practicable, but no later than 30 days prior to the intended receipt of the radiation sources. The appropriate forms required for specific types of radiation sources and the data submittal requirements for approval are described in this section.

4.5.3. 45 SW Form 2255, **Radiation Use Request/Authorization (Radioactive Materials)**, must be completed and submitted for evaluation of all intended users of radioactive materials including sources contained within equipment, instrumentation, or devices.

4.5.4. 45 SW Form 2254, **Radiation Use Request/Authorization (Ionizing Machine/Device)**, must be completed and submitted for evaluation of all intended use of ionizing radiation producing machines/devices.

4.5.5. 45 SW Form 2256, **Radiation Training and Experience Summary (Ionizing Radiation)**, must be completed and submitted for evaluation of the Area Radiation Officer and each person intended to possess and use the specific radiation sources.

4.5.6. The 45 SW Form 2260, **Modification of Radiation Use Authorization**, must be completed and submitted for evaluation of any intended changes or modifications to applicable procedures, licenses, registrations, facilities, personnel, equipment or materials described by the current Radiation Use Authorization. Submittal of modification requests should be made no later than 30 days prior to such intended changes taking effect.

4.5.7. Certain information is required to be submitted in support of a specific 45th Space Wing Radiation Use Request form. All documentation will be submitted as a single complete original package and one complete package copy, as early as practicable, but no later than 30 days prior to intended use. Elements of this complete package include, but may not necessarily be limited to:

4.5.7.1. The appropriate Radiation Use Request/Authorization form as described in paragraph **4.5.**

4.5.7.2. USNRC or Agreement State licenses or other appropriate authorizations (i.e., registrations possessed by the requester to own, maintain and use the specific radiation source).

4.5.7.3. Copies of basic license/registration applications, subsequent amendments, and any pertinent correspondence between the regulatory agency and the licensee/registrant will be submitted with the license or registration.

4.5.7.4. All applicable operating and emergency procedures involving procurement, possession, and use of radiation sources for which authorization is being requested.

4.5.7.5. Completed original of 45 SW Form 2256 for each individual User, Area Radiation Officer and Use Supervisor/Custodians who will use or control the sources of ionizing radiation.

4.5.7.6. Names and telephone numbers of responsible individuals (including the Area Radiation Officer) assigned the control and accountability responsibilities for the sources.

4.5.7.7. Approximate dates of intended arrival and departure of the sources of radiation, the proposed mode of transportation to be utilized, description and specifications of packaging/special containment, and any shielding or special handling instructions, as applicable.

4.6. Radiation Protection Controls for Ionizing Radiation.

4.6.1. Control measures required by AFI 48-148 and the applicable Radiation Use Authorization shall apply at all times when radioactive materials or a radiation-producing device is being used.

4.6.2. All radiation areas will be identified, posted, and controlled to prevent unnecessary exposure to personnel. Identification of such areas will be made in coordination with the 45th Space Wing Radiation Protection Officer. Normally, areas requiring posting and control as radiation areas will be identified by the 45th Space Wing Radiation Protection Officer as part of the specific provisions of the Radiation Use Authorization. User organizations will ensure that these radiation areas (and sources) remain controlled and posted with appropriate signs, tags, labels, barriers, and notices/instructions, as specified therein. A sufficient number of warning signs will be used to adequately identify the controlled areas.

4.6.3. Approved users will control access to radiation areas. No personnel will enter a radiation area without prior authorization and appropriate dosimeter devices. Violations of radiation areas by unauthorized personnel will be viewed as incidents. In such cases, the user organization will immediately secure operations, escort the violator out of the radiation area, obtain the individual's name, organization, badge number, and supervisor's name/telephone number, and report the incident to the 45th Space Wing Radiation Protection Officer for investigation.

4.7. Radiation Exposure Control.

4.7.1. Radiation exposures to personnel will be monitored and maintained at levels as low as reasonably achievable (ALARA). All operations involving the use of radiation sources will be designed to conform to the principles of ALARA. In all cases, operations involving potential radiation exposures will be reviewed, evaluated, and control provisions identified to minimize radiation exposure. It is the responsibility of each individual involved in the use of radiation sources to use any reasonable means available to ensure the minimization of radiation exposure to themselves and to others from sources of radiation under their control.

4.7.2. In the absence of specifically identified external radiation exposure control provisions, all personnel will employ the use of limiting stay times in radiation areas, maximizing distance from radiation sources (consistent with operational requirements), and employing any appropriate means of shielding available. No radiological operations, excluding specifically approved medical procedures, will be performed which would inherently result in internal deposition of radionuclides.

4.7.3. Operations having a potential of resulting in internal deposition of radioactive materials as a result of an accident or incident will include the identification and use of limiting provisions, control measures, and protective equipment to preclude such potential uptake.

4.8. Transportation and Receipt of Radioactive Materials.

4.8.1. Transportation of radioactive materials requires prior coordination and approval by the 45th Space Wing Radiation Protection Officer.

4.8.2. Requests for transportation authorization will include the following information:

4.8.2.1. Name of person responsible for the procedure.

4.8.2.2. Identification of the source (isotope, form, type, activity, etc.).

4.8.2.3. Type of vehicle.

4.8.2.4. Point of origin and delivery.

4.8.2.5. Name of authorized receiver, if applicable.

4.8.2.6. Description of container and shielding.

4.8.2.7. Proposed route of travel.

4.8.2.8. Special handling equipment.

4.8.2.9. Procedures, restrictions and precautions.

4.8.3. Transportation of radiation sources will be in accordance with applicable State and Federal Department of Transportation (DOT) requirements. All such transfer activities will be coordinated and approved, in advance, through the 45th Space Wing Radiation Protection Officer. Shipments of radioactive material require completion of 45 SW Form 2252, **Radioactive Material Transfer and Shipment Record (Outbound)**, and 45 SW Form 2261, **Radioactive Material Transfer Receipt**.

4.8.4. The user is responsible for ensuring that the radioactive material package or container is properly marked and labeled, safely loaded for transport, and the transport vehicle is in compliance with applicable transportation requirements. The user will ensure transportation forms are accurately completed, copies distributed, and shipment receipt is acknowledged by the receiving organization.

4.8.5. Loss, theft, or accident involving radiation sources in transit will be immediately reported to the local emergency response and security agencies and to the 45th Space Wing Radiation Protection Officer.

4.8.6. Unless otherwise specifically exempted by the 45th Space Wing Radiation Protection Officer, any organization receiving radioactive materials or radiation producing devices will notify the JBOSC Health Physics Office prior to or upon receipt of the item. Notification shall include a description of the material or device, destination, and user organization.

4.8.7. Each receiving organization will have a designated controlled access storage area for short term holding of such materials. Under no circumstances will such material be released to the consignee/user until the JBOSC Health Physics Office has been notified.

4.8.8. Transportation vehicles carrying packages labeled with Radioactive Yellow III labels, or other as designated by the 45th Space Wing Radiation Protection Officer, will not be unloaded until the vehicle has been surveyed by the JBOSC Health Physics Office.

4.9. Radioactive Waste Control.

4.9.1. All radioactive waste will be strictly controlled and disposal will be in accordance with 45th Space Wing Radiation Protection Program procedures. Procedures for control of radioactive waste will be so designed as to preclude the release to or contamination of the local environment by any radioactive material.

4.9.2. No radioactive waste material may be disposed of or removed from the Eastern Range by the individual user without prior approval of the 45th Space Wing Radiation Protection Officer. In the absence of other approved prior arrangements, waste material will be collected and disposed of by the JBOSC Health Physics Office on CCAFS using methods consistent with all applicable directives and accepted radiation protection practices.

5. Control Provisions and Guidelines for the Use of Lasers and Optical Radiation Devices.

5.1. General. Procurement, possession, and use of lasers and optical radiation devices require prior coordination and approval from the 45th Space Wing Radiation Protection Officer. Because of the unique nature of certain laser or optical radiation devices, regulatory agencies outside of the 45th Space Wing may require authorization or registration of the device or intended use location in addition to 45th Space Wing approval. The provisions and guidelines in this chapter are provided to assist users in their effort to comply with the requirements as well as those of other regulatory agencies as they apply to operations on the Eastern Range.

5.2. Registration. Certain types of hazardous nonionizing radiation devices on pertinent areas of the Eastern Range may require specific registration by the State of Florida. Copies of all such registrations must be provided to the 45th Space Wing Radiation Protection Officer as part of the data submittal required for authorization of laser or optical radiation devices.

5.3. The 45th Space Wing Required Authorizations and Provisions.

5.3.1. Any organization or individual functioning under 45th Space Wing jurisdiction proposing to procure, possess, use, store, transfer or otherwise dispose of hazardous laser or optical radiation devices that are not specifically exempted from 45th Space Wing Radiation Protection Program requirements must request and obtain radiation use authorization to do so. The 45th Space Wing Radiation Protection Officer is the focal point of the 45th Space Wing Radiation Protection Program for coordination of such authorizations.

5.3.2. Unless specifically exempted, radiation use authorization is required for:

5.3.2.1. Lasers and laser systems, (ANSI Class II or greater).

5.3.2.2. Potentially hazardous nonlaser optical radiation devices operating in the ultraviolet, visible, or infrared wavelength range of the electromagnetic spectrum.

5.3.2.3. Laser diodes, laser diode arrays, or light emitting diodes (LEDs).

5.3.2.4. Optical fiber communication systems (OFCS) utilizing laser diodes and LEDs (Service Group 2 and above).

5.3.3. Prior written authorization to use laser or optical radiation devices on to the Eastern Range must be obtained from the 45th Space Wing Radiation Protection Officer. This applies to activities that involve the acquisition, possession, use, storage, and transfer or other disposition of such laser

or optical radiation devices. No operation or modification to existing operation will be initiated prior to the issuance of a Radiation Use Authorization.

5.3.4. Radiation use authorization of storage and use areas and facilities shall be obtained prior to commencement of initial operations.

5.3.5. Individual users and use organizations shall ensure accountability for their sources and coordinate this effort with the 45th Space Wing Radiation Protection Officer.

5.3.6. Radiation controlled areas and exclusion areas described by the applicable Radiation Use Authorization will be posted and controlled by the user.

5.3.7. Any nonexempt laser or optical radiation device improperly transported onto the Eastern Range will be subject to impoundment until either the irregularities are corrected and appropriate authorizations are obtained or removal from the Eastern Range is arranged.

5.3.8. Noncompliance with 45th Space Wing Radiation Protection Program requirements relative to the authorized use of lasers or optical radiation devices will result in the revocation or suspension of such radiation use authorization, and impoundment of radiation devices.

5.4. Data Submittals and Approvals.

5.4.1. Radiation use authorization for the possession or use of laser or optical radiation devices requires submittal of the appropriate completed 45th Space Wing Radiation Protection Program forms for the type of devices, together with any supportive data required.

5.4.2. Submittals shall be made as soon as practicable, and should be provided no later than 30 days prior to the intended arrival of the radiation devices. Appropriate forms required for laser and optical radiation devices and associated data submittal requirements for radiation use authorization are described in this chapter.

5.4.3. The 45 SW Form 2244, **Radiation Use Request/Authorization (Laser/Optical Device)**, must be completed and submitted for evaluation of all intended uses of lasers and laser systems; including laser diodes, diode arrays, and LEDs not associated with optical fiber communications systems (OFCS); and lasers incorporated in equipment, instrumentation, or other devices.

5.4.4. 45 SW Form 2244 must be completed and submitted for evaluation of all intended uses of non-laser optical radiation devices, fiber optic systems, and OFCS, including equipment, instrumentation, or other items incorporating such devices.

5.4.5. The 45 SW Form 2257, **Training and Experience Summary (Nonionizing Radiation)**, must be completed and submitted for evaluation of the Area Radiation Officer and each person intended to possess and use the specific laser or optical radiation device.

5.4.6. The 45 SW Form 2260, **Modification of Radiation Use Authorization**, shall be completed and submitted for evaluation of any intended changes to applicable procedures, licenses or registrations, facilities, personnel, or equipment or materials described by the current Radiation Use Authorization. Submittal of requests for modification of radiation use authorization should be submitted not later than 30 days prior to the implementation of the intended changes.

5.4.7. Requests for use of lasers or optical devices shall be submitted to the 45th Space Wing Radiation Protection Officer. Elements of a complete data submittal package for radiation use authorization include, but may not necessarily be limited to, those described below.

5.4.7.1. The appropriate Radiation Use Request/Authorization form as described by paragraph 5.4.

5.4.7.2. Licenses or other appropriate registrations possessed by the user organization to own, maintain, and use the specific radiation device.

5.4.7.3. All applicable operating, maintenance, and emergency procedures relating to possession and use of the radiation device for which radiation use authorization is being requested.

5.4.7.4. Listing, by full name and social security number, of all proposed user/operator personnel, accompanied by a completed 45 SW Form 2257 for each individual identified.

5.4.7.5. Completed 45 SW Form 2257 for the designated Area Radiation Officer and all users.

5.4.7.6. Approximate dates of arrival and departure of the specified radiation device, and mission or payload designation.

5.5. Program Exemptions. A variety of commercially available consumer, business, and industrial application laser and optical radiation devices are exempted from the requirements of the 45th Space Wing Radiation Protection Program due to their common usage and negligible potential for hazardous exposure under conditions of normal use. However, such exemption is valid only when certain conditions are met. The following paragraphs describe currently exempted devices and the conditions necessary for their exemption. Individuals should consult with the 45th Space Wing Radiation Protection Officer or the JBOSC Health Physics Office if there is a question regarding applicability of program exemption to their particular situation or requirement.

5.5.1. The following general categories of products and systems using Class 1 laser devices are exempted:

5.5.1.1. Laser printers.

5.5.1.2. Laser copiers.

5.5.1.3. Image scanners.

5.5.1.4. CD-ROM players.

5.5.1.5. Barcode scanner, reader, and verifier units.

5.5.1.6. Class 1 laser devices and any other Class 1 laser product, except for those that allow access to other classes of laser radiation during servicing operations, provided that the laser product is maintained as a Class 1 laser product through its useful life.

5.5.1.7. Service Group 1 (SG1) fiber optic systems and fiber optic systems when normal operation does not involve connection or disconnection of cables.

5.5.2. The following general categories of products and systems using non-laser optical devices are exempted.

5.5.2.1. Photographic strobe units.

5.5.2.2. High intensity discharge (HID) lamps utilized for facility lighting.

5.5.2.3. Infrared radiation devices with accessible irradiance less than 0.1 milliwatt per square centimeter (mW/cm^2).

5.5.2.4. Visible radiation devices with accessible luminance less than 1 candela per square centimeter (cd/cm^2).

5.5.2.5. Ultraviolet radiation devices with accessible effective irradiance of less than 0.1 microwatt per square centimeter (uW/cm^2).

5.5.3. Exemptions are valid for the general categories of equipment, instruments, and systems identified by paragraph 5.5.1. and 5.5.2. provided that:

5.5.3.1. The individual item is maintained in its original design configuration and utilized for its originally intended use.

5.5.3.2. The design and manufacture of the item is in accordance with the specifications of the Federal Performance Standard for Light Emitting Products (Title 21, CFR, Part 1040).

5.5.3.3. The item is operated in accordance with the manufacturer's recommended operating procedures.

5.5.3.4. Maintenance, service, or repair activities that could expose personnel to laser radiation will be performed only by appropriately authorized and qualified personnel.

5.6. Radiation Protection Controls for Lasers and Laser Systems.

5.6.1. Control measures required by AFOSH STD 48-139, ANSI Z-136.1, and the Radiation Use Authorization shall apply at all times when a laser or laser system is in operation.

5.6.2. Control measures required by AFOSH STD 48-139, ANSI Z-136.2, and the Radiation Use Authorization shall apply at all times during OFCS installation and service.

6. Control Provisions and Guidelines for the Use of Radiofrequency/Microwave Radiation Devices.

6.1. General. Procurement, possession, and use of radio frequency/microwave (RF/microwave) radiation devices require prior coordination and approval from the 45th Space Wing Radiation Protection Officer. Because of the unique nature of certain RF/microwave radiation devices, regulatory agencies outside of the 45th Space Wing to require authorization or registration of the device or intended use location in addition to 45th Space Wing approval. The provisions and guidelines in this chapter are provided to assist users in their effort to comply with the requirements as well as those of other regulatory agencies as they apply to operations on the Eastern Range.

6.2. Registration. Certain nonionizing radiation devices on pertinent areas of the Eastern Range may require specific registration by Federal agencies, such as the Federal Communications Commission. Copies of all such registrations must be provided to the 45th Space Wing Radiation Protection Officer as part of the data submittal required for radiation use authorization of RF/microwave radiation devices.

6.3. The 45th Space Wing Required Authorizations and Provisions.

6.3.1. Any organization or individual functioning under 45th Space Wing jurisdiction proposing to procure, possess, use, store, transfer or otherwise dispose of RF/microwave devices that are not specifically exempted from 45th Space Wing Radiation Protection Program requirements must request and obtain radiation use authorization to do so. The 45th Space Wing Radiation Protection Officer is the focal point of the 45th Space Wing Radiation Protection Program for coordination of such authorizations.

6.3.2. Unless specifically exempted, radiation use authorization is required for any RF/microwave radiation device operating at frequencies between 3kHz and 300 GHz, to include but not limited to:

6.3.2.1. Radar systems.

6.3.2.2. Spacecraft and vehicle telemetry and communications systems.

6.3.2.3. Earth stations.

6.3.2.4. Microwave diathermy units.

6.3.2.5. Radiofrequency generators.

6.3.3. Prior written authorization to use RF/microwave radiation devices on the Eastern Range must be obtained from the 45th Space Wing Radiation Protection Officer. This applies to activities that involve the acquisition, possession, use, storage, and transfer or other disposition of such RF/microwave radiation devices. No operation or modification to existing operation will be initiated prior to the issuance of a Radiation Use Authorization.

6.3.4. Radiation use authorization for storage and use areas and facilities shall be obtained prior to commencement of initial operations.

6.3.5. Individual users and use organizations shall ensure accountability for their sources and coordinate this effort with the 45th Space Wing Radiation Protection Officer.

6.3.6. Radiation controlled areas and exclusion areas described by the applicable Radiation Use Authorization will be posted and controlled by the user.

6.3.7. Any non-exempt RF/microwave radiation device improperly transported onto the Eastern Range will be subject to impoundment until either the irregularities are corrected and appropriate radiation use authorization is obtained or removal from the Range is arranged.

6.3.8. Noncompliance with 45th Space Wing Radiation Protection Program requirements relative to the authorized use of RF/microwave radiation devices will result in the revocation or suspension of such radiation use authorization, and impoundment of radiation devices.

6.4. Data Submittals and Approvals.

6.4.1. Radiation use authorization for the possession or use of RF/microwave radiation devices requires submittal of the appropriate completed 45th Space Wing Radiation Protection Program forms for the devices, together with any supportive data required.

6.4.2. Submittals shall be made as soon as practicable, but no later than 30 days prior to the intended arrival of the radiation devices. Appropriate forms required for RF/microwave radiation devices and associated data submittal requirements for radiation use authorization are described in this section.

6.4.3. The 45 SW Form 2245, **Radiofrequency/Microwave Systems Use Request/Authorization**, must be completed and submitted for evaluation of all intended uses of radiofrequency and microwave systems; including radar units, communication systems, satellite earth stations, radiofrequency generators.

6.4.4. The 45 SW Form 2257, **Training and Experience Summary (Nonionizing Radiation)**, must be completed and submitted for evaluation of the Area Radiation Officer and each person intended to possess and use the specific RF/microwave radiation device.

6.4.5. The 45 SW Form 2260, **Modification of Radiation Use Authorization**, shall be completed and submitted for evaluation of any intended changes to applicable procedures, licenses or registrations, facilities, personnel, or equipment or materials described by the current Radiation Use Authorization. Submittal of requests for modification of radiation use authorization shall be submitted no later than 30 days prior to the implementation of the intended changes.

6.4.6. Request for use of RF/microwave radiation devices shall be submitted to the 45th Space Wing Radiation Protection Officer. Elements of a complete data submittal package for radiation use authorization include, but may not necessarily be limited to:

6.4.6.1. The appropriate Radiation Use Request/Authorization form as described by paragraphs [6.3.2.1](#) and [6.3.2.2](#).

6.4.6.2. Licenses or other appropriate registrations possessed by the user organization to own, maintain, and use the specific radiation device.

6.4.6.3. All applicable operating, maintenance, and emergency procedures relating to possession and use of the radiation devices for which radiation use authorization is being requested.

6.4.6.4. A listing, by full name and social security number, of all proposed user/operator personnel, accompanied by a completed 45 SW Form 2260 for each individual identified.

6.4.6.5. A completed 45 SW Form 2260 for the designated Area Radiation Officer and Use Supervisor/Custodian.

6.4.6.6. Approximate dates of arrival and departure of the specified radiation devices to and from the Eastern Range, and mission or payload designation.

6.5. Program Exemptions. A variety of commercially available consumer, business, and industrial application RF/microwave radiation devices are exempted from the requirements of the 45th Space Wing Radiation Protection Program due to their common usage and negligible potential for hazardous exposure under conditions of normal use. However, such exemption is valid only when certain conditions are met. The following paragraphs describe currently exempted devices and the conditions necessary for their exemption. Individuals should consult with the 45th Space Wing Radiation Protection Officer or the JBOSC Health Physics Office if there is a question regarding applicability of program exemption to their particular situation or requirement.

6.5.1. The following general categories of radiofrequency and microwave radiation devices are exempted:

6.5.1.1. Devices with transmitter power of 7 watts or less and an antenna gain of unity (walkie-talkies, car phones, cellular phones).

6.5.1.2. Speed monitoring devices (radar-guns).

6.5.1.3. Automotive radar detectors.

6.5.1.4. RF/microwave radiation devices designed for and operated in a completely enclosed configuration where no open-air transmission is possible.

6.5.1.5. RF/microwave radiation devices designed to operate in a hard-lined, closed loop configuration where no open-air transmission is possible.

6.5.1.6. Microwave oven.

6.5.2. Exemptions are valid for the general categories of equipment, instruments, and systems identified by paragraph 6.4.1. provided that:

6.5.2.1. The individual item is maintained in its original design configuration and utilized for its originally intended use over the useful life of the item.

6.5.2.2. The design and manufacture of the item is in accordance with the specifications of the Federal Performance Standard for Electronic Products (Title 21, CFR, Part 1010).

6.5.2.3. The item is operated in accordance with the manufacturer's recommended operating procedures.

6.5.2.4. Only appropriately authorized and qualified personnel will perform maintenance, service, or repair activities that could expose personnel to RF/microwave radiation.

6.6. Radiation Protection Controls for RF/Microwave Systems. Control measures required by AFOSH STD 48-9 and the applicable Radiation Use Authorization shall apply at all times when an RF/microwave system is in operation.

SUSAN J. HELMS, Colonel, USAF
Vice Commander

Attachment 1

AS LOW AS REASONABLY ACHIEVEABLE POLICY

A1.1. Introduction. As Low As Reasonably Achievable (ALARA) is a policy adopted by the nuclear and radiation protection communities to maintain doses from ionizing radiation to a level where risk to an individual or group of individuals from any necessary exposure is minimized, while beneficial work is being accomplished. For example, certain tasks require work with or near a radioactive source. Personnel performing these tasks will receive a radiation dose. ALARA practices do not preclude the work being done, but require that it be done effectively and efficiently, thereby decreasing the amount of time personnel have to spend near the material, and decreasing the dose received. The Nuclear Regulatory Commission, Department of Energy, the U.S. Air Force and state and local law, require ALARA as an operational policy.

A1.2. Policy. It is the policy of 45th Space Wing that all ionizing radiation doses will be maintained ALARA. While it is understood that in many operational circumstances a radiation dose is unavoidable, unnecessary dose is to be eliminated.

A1.3. Responsibility.

A1.3.1. 45th Space Wing Radiation Protection Officer. The 45th Space Wing Radiation Protection Officer has the overall responsibility for the implementation of the 45th Space Wing ALARA program. As such, he is responsible for reviewing dosimeter reports, conducting surveys of work sites, reviewing and recommending changes to work practices and investigating doses received which he considers questionable or which exceed investigation limits. If the 45th Space Wing Radiation Protection Officer is unavailable, this responsibility falls to the designated alternate, normally Bioenvironmental Engineering (45 ADOS/SGGB).

A1.3.2. Work Center Supervisors. Work center supervisors have the responsibility for effectively minimizing personnel ionizing radiation exposure. This can be accomplished by:

A1.3.2.1. Proper job planning to include considering the effects of time, distance and shielding in reducing dose.

A1.3.2.2. Considering the use of mock-ups to practice a difficult job.

A1.3.2.3. Ensuring personnel are properly trained to perform the job at hand. Poorly trained personnel may spend a great deal of time beyond that needed by a trained worker to perform the same task.

A1.3.2.4. Ensuring dosimeters are worn if required.

A1.3.2.5. Ensuring warning boundaries are in place if required.

A1.3.2.6. Referring any questions to the 45th Space Wing Radiation Protection Officer.

A1.3.3. Individuals. Individuals are responsible to maintain their own exposures to an ALARA level.

A1.4. Investigational Limits. A threshold of dose above which an investigation by the 45th Space Wing Radiation Protection Officer is warranted. Results of the investigation will be discussed with the individual, and presented to the Aeromedical Council without naming the individual. If the results of the investi-

gation indicate a change in work practices is needed, this will be discussed with appropriate work center supervisors, Bioenvironmental Engineering services, and also reported to the Aeromedical Council. The investigational limits for whole body, head or extremity doses to radiation workers are as follows

A1.4.1. Monthly. A dose in excess of 100 mRem.

A1.4.2. Quarterly. A dose in excess of 125 mRem.

A1.4.3. Pregnant Workers. A dose in excess of 50 mRem.

A1.5. ALARA Report to Aerospace Medicine Council. A report of significant facts and events about the radiation program shall be made annually. The reports shall consist of the following at a minimum:

A1.5.1. Review of dosimeter results.

A1.5.2. Review of significant survey results.

A1.5.3. Review of investigations.

A1.5.4. Review of radioactive material permits.

A1.5.5. Review of inspections.

A1.6. Aerospace Medicine Council. The Aerospace Medicine Council shall review all ALARA reports presented by the 45th Space Wing Radiation Protection Officer, as well as radiation issues discussed at the Occupational Health Working Group and make recommendations as required. The ALARA reports shall be included as an attachment to the Aeromedical Council minutes on an annual basis.

A1.7. Declared Pregnant Workers and Their Supervisors. Declared pregnant workers are required to be educated about the specific hazards of exposure to ionizing radiation while pregnant. Guidance is available from the Nuclear Regulatory Commission in NUREG 8.13. This training must be documented. Declared pregnant military workers must inform their supervisors in writing of a confirmed pregnancy as soon as possible. Civilian workers should declare their pregnancy but the decision is voluntary. Supervisors shall ensure that the 45th Space Wing Radiation Protection Officer and 45 ADOS/SGGB are informed so that appropriate badging, exposure limits, and other necessary actions can be instituted.

Attachment 2

RADIATION INCIDENT GUIDELINES AND NOTIFICATIONS

A2.1. General.

A2.1.1. Radiation incidents may result in exposure of personnel and radioactive contamination that can be spread or dispersed in situations such as fire, flood, explosion, spillage, or breach of containment.

A2.1.2. The resulting radiation cannot be detected except by the use of specialized techniques and instrumentation. The procedures described in this attachment are intended to be applied to the extent needed in any radiation incident to protect personnel.

A2.2. Basic Emergency Procedures.

A2.2.1. Eliminate the source of radiation. Remove power source to radiation producing device. (If unable to remove power to radiation source, evacuate personnel from the immediate area). If source is radioactive material, cover source with applicable shielding material.

A2.2.2. Isolate the contamination. Close doors, windows, etc. Shut down air handling systems, lab hoods, etc.

A2.2.3. Evacuate personnel to a safe marshaling area and have all personnel remain in the area. The marshaling area should be upwind if radioactive material spill is involved.

A2.2.4. Notify Appropriate Response Elements.

A2.2.4.1. Radiation incidents involving fire, explosion, personnel injury or facility damage requiring emergency response by medical, fire, or security elements should be reported by using the telephone number 911.

A2.2.4.2. All other radiation incidents not requiring emergency notification must be immediately reported to the 45th Space Wing Radiation Protection Officer or JBOSC Health Physics Office.

A2.2.4.3. Caller should be able to identify the radiation source and describe its involvement in the emergency.

A2.2.5. Standby Activities for Affected Area Personnel.

A2.2.5.1. Control unauthorized access to the area.

A2.2.5.2. Inform response element(s) of the nature of the radiological hazard (i.e., type of device).

A2.2.5.3. Detain evacuated personnel in marshaling area until released by the 45th Space Wing Radiation Protection Officer, or designated representative.

A2.2.5.4. Potentially exposed or otherwise involved personnel shall be prepared to provide a detailed account of conditions/circumstances surrounding the exposure incident.

A2.3. Radiation Incident Notification.

A2.3.1. All Hours Emergency Response (Fire, Medical, Security) 911.

A2.3.2. Normal Duty Hours (0730-1630).

- A2.3.2.1. The 45th Space Wing Radiation Protection Officer (PAFB) 494-5435.
- A2.3.2.2. Bioenvironmental Engineering (PAFB) 494-5435.
- A2.3.2.3. JBOSC Health Physics Office (CCAFS) 853-5688.
- A2.3.2.4. KSC Radiation Protection Officer (KSC) 867-6958.
- A2.3.3. After Normal Duty Hours (1630-0730), Holidays and Weekends.
 - A2.3.3.1. Patrick Command Post (Operations on PAFB) 494-7001.
 - A2.3.3.2. Cape Support (Operations on CCAFS) 853-5211.
 - A2.3.3.3. JBOSC Duty Office (Operations on KSC) 861-5050.