Draft Description of Proposed Action and Alternatives for the Air Force Service Life Extension Program at Beale Air Force Base, California Cape Cod Air Force Station, Massachusetts Clear Air Force Station, Alaska

July 2000

I. INTRODUCTION

The U.S. military operates an extensive early warning network consisting of ground-based radars and space-based sensors in order to detect intercontinental ballistic missile (ICBM) and sea-launched ballistic missile (SLBM) raids against the U.S. and Canada. Part of this early warning network includes two PAVE PAWS (Phased-Array Warning System) sites at Beale Air Force Base (AFB), California, and Cape Cod Air Force Station (AFS), Massachusetts, and one BMEWS (Ballistic Missile Early Warning System) site at Clear AFS, Alaska (Figure 1). Each of these sites use the same type of radar system, a Solid-State Phased-Array Radar System (SSPARS), to accomplish the missions of long-range search/surveillance and tracking.

The SSPARS radars use 1970s and 1980s computer technologies and many of the radars' computer components are no longer being manufactured. Although the U.S. Air Force (USAF) has a limited inventory of spare computer components for the radars, if a critical component were to fail and a spare were unavailable, the radar would become inoperable. To prevent the USAF from being unable to perform the missions of missile warning and space surveillance due to a lack of spare components, the USAF is proposing sustainment of the SSPARS radar through a Service Life Extension Program (SLEP). The SLEP action will replace outdated computer components and associated software in all SSPARS radars.

Prior to implementing the SLEP action, the USAF elected to perform an environmental impact statement (EIS). Part of the EIS process requires that the public be given the opportunity to participate in the EIS scoping process. This draft document, known as the Description of Proposed Action and Alternatives (DOPAA) describes the SLEP action and identifies alternatives to the SLEP. It is made available to the public so that persons participating in the public scoping process will be better able to assist the USAF in identifying relevant issues associated with the SLEP action.

II. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

NEPA established a national policy to protect the environment and ensure that federal agencies consider the environmental effects of actions in their decision making. The Council for Environmental Quality (CEQ) promulgated regulations that implement NEPA. The USAF regulations further implement CEQ Regulations. To comply with these regulations, the USAF is required to prepare an EIS if a major federal action would significantly affect the human environment. Ordinarily, maintenance and modernization of computer equipment and associated hardware would not warrant preparation of an EIS. However, due to environmental controversy surrounding the operation of the radars, the USAF has committed to prepare an EIS.

EXPLANATION

United States
PAVE PAWS/BMEWS
Radar Sites

Not to Scale

Figure 1

The Notice of Intent (NOI) to prepare an EIS for actions to sustain operability of Air Force Space Command PAVE PAWS radar sites was published in the Federal Register on January 27, 2000. This began the scoping process that will identify the significant environmental issues relevant to the proposed SLEP activities and provides an opportunity for public involvement in the development of the EIS. Notification of public scoping efforts was made through local media as well as through letters to federal, state, and local agencies and officials and interested groups and individuals. Public meetings were held on the following dates to solicit comments and concerns from the general public:

- May 8, 2000, at the Forestdale Elementary School in Sandwich, Massachusetts
- May 11, 2000, at the Bourne Best Western in Bourne, Massachusetts
- May 15, 2000, at the Mashpee High School in Mashpee Massachusetts
- May 16, 2000, at the Falmouth Holiday Inn in Falmouth, Massachusetts.

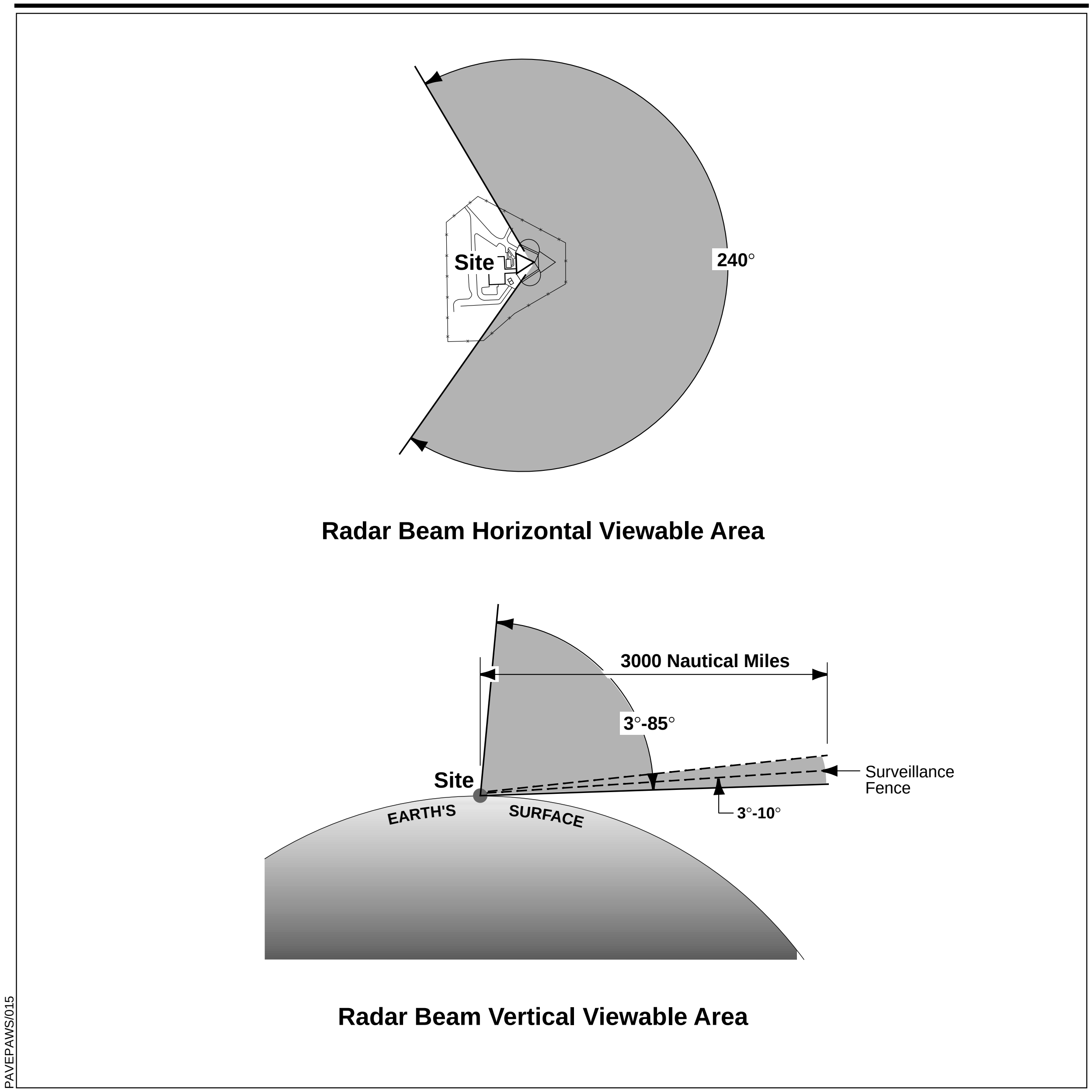
At these public scoping meetings, representatives of the USAF presented an overview of the meeting's objectives, agenda, and procedures, and described the process and purpose for the development of an EIS. In addition to verbal comments, written comments were received and will continue to be received during the entire scoping process. These comments, as well as comments received from upcoming scoping meetings in Alaska, California, and Massachusetts are being used to determine the scope and direction of studies/analyses to accomplish this EIS.

III. SSPARS DESCRIPTION

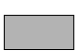
As part of an early warning system, the USAF operates the SSPARS facilities to perform the current missile warning and satellite tracking missions with respect to ICBM and SLBM attacks against the United States and Canada. The SSPARS is a long-range search/surveillance and tracking system whose primary mission is missile warning. Its secondary mission involves space tracking in order to estimate trajectories of launched objects, as well as earth satellites and other space objects.

Missile Warning

To detect and determine attack characteristics of ICBMs and SLBMs aimed at the U.S and Canada, the radar devotes approximately one-half of its time generating what is called a “surveillance fence.” This constitutes the center of the main beam scanning at elevations between 3 and 10 degrees above horizontal over a 240-degree (120 degrees per face) scan area (Figure 2). The surveillance fence is normally at 3 degrees. In the surveillance mode, the direction of the



EXPLANATION



Viewable Area

Radar Beam Viewable Areas

Figure 2

beam is steered according to a computer-programmed pattern, moving from one position to another in tens of microseconds. In the surveillance mode, both faces of the radar are simultaneously active, sending out two parallel beams moving in a fashion similar to windshield wipers. Under normal operational circumstances, the radar is transmitting 11 percent of the time to maintain the surveillance fence. The SSPARS is also capable of performing the surveillance mission at up to 18 percent of the time with no tracking mission.

Space Surveillance

Satellite tracking missions are conducted to track and catalog earth satellites and identify other space objects. The radar can allocate the remainder of the time to focus on particular objects or a small cluster of objects. The radar can transmit from 7 to 29.6 percent of the time, as long as the maximum average time, in any combination of modes, does not exceed 25 percent.

SSPARS Operations

The SSPARS transmits pulsed radio frequency (RF) signals. Signals are reflected by objects back to the radar. These signals are analyzed to determine the location, distance, size, and speed of the object.

The SSPARS is housed in a 32-meter (105-foot) high building with three sides. Two flat arrays transmit and receive RF signals generated by the radar. Each array face contains 1,792 active antenna elements. The mission-critical computers, computer monitors, tape drives, disk drives, and associated equipment that generates the RF signals and then analyzes the return signals are housed inside the radar building. The two array faces are 31 meters (102 feet) wide and are tilted back 20 degrees from vertical (Figure 3). The active portion of each array face is situated in the center in a circle 22.1 meters (72.5 feet) wide. Each active antenna element is connected to a separate solid-state transmitter/ receiver located in the radar building that provides 340 watts of power for transmitting RF signals and amplifies the returning signal.

The RF signals transmitted from each of the array faces form one narrow main beam with a width of 2.2 degrees. Most of the energy is contained in the main beam. Each of the main beams can be directed electronically between 3 and 85 degrees above horizontal. Figure 2 shows the minimum and maximum vertical angles at which the main beams can be directed.

PAVEPAWS/016

Typical Solid State Phased-Array Radar Facility

Figure 3

IV. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action, alternatives to the Proposed Action, and the No-Action Alternative include:

- **Proposed Action.** The Proposed Action would implement the USAF SLEP. The SLEP replaces computers, computer monitors, tape drives, disk drives, other related computer equipment, and computer software at the existing SSPARS at Beale AFB, California, Cape Cod AFS, Massachusetts, and Clear AFS, Alaska.

- **SLEP with Shielding Alternative.** This alternative would implement the USAF SLEP and provide a barrier or barriers along the path of the radar beam to absorb or block the side lobe energy.

- **Relocation Alternative.** This alternative would relocate the radar facility to a new area.

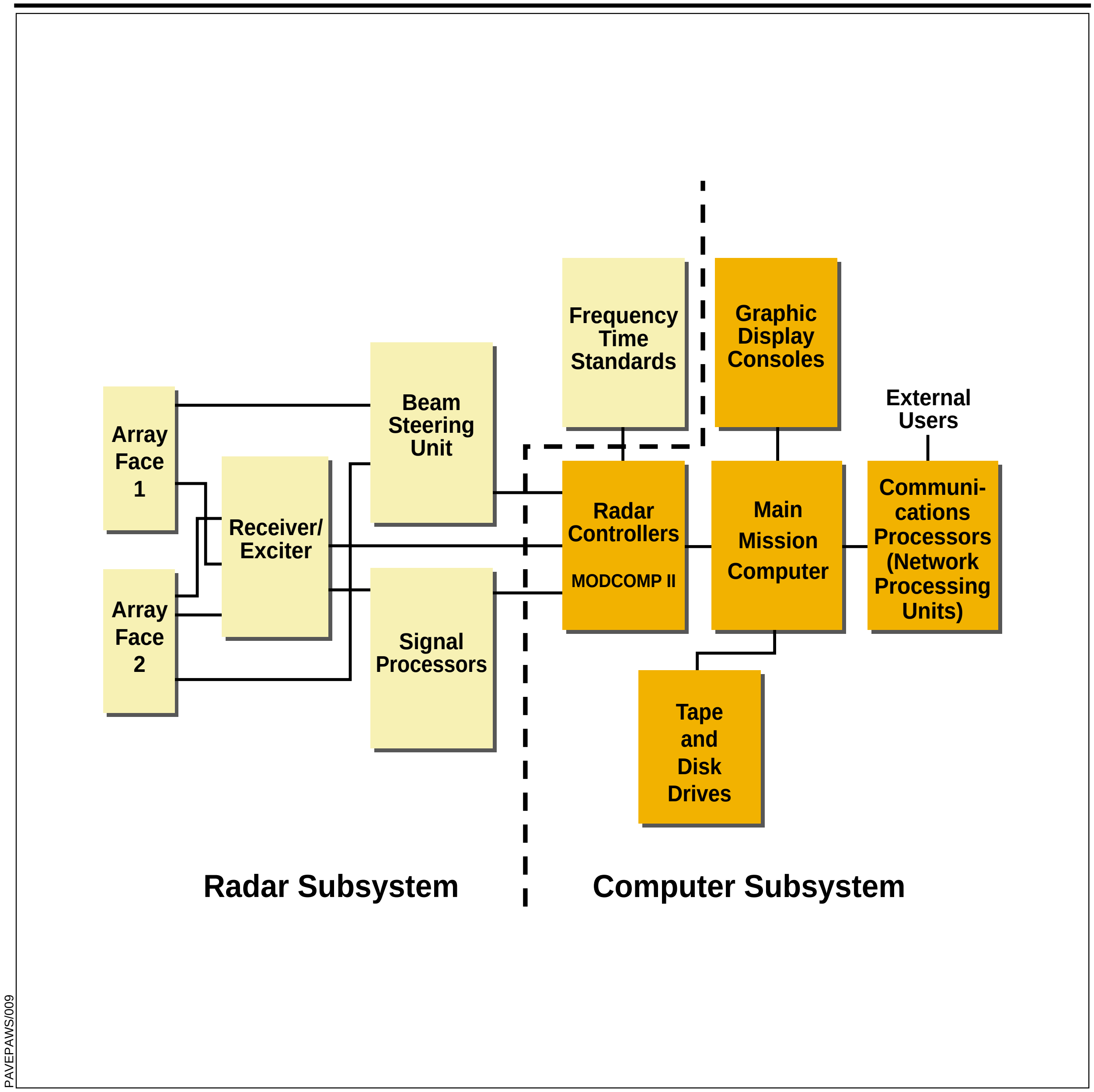
- **Spare Components Alternative.** This alternative would require that equipment manufacturers reproduce and provide the necessary replacement “spare” parts to continue operating the SSPARS facilities.

- **No-Action Alternative.** The No-Action Alternative involves not implementing the proposed SLEP computer hardware and software replacement actions in the SSPARS at Beale AFB, Cape Cod AFS, and Clear AFS.

DESCRIPTION OF PROPOSED ACTION

Under the Proposed Action, computers, computer monitors, computer keyboards, tape and disk drives, and computer software manufactured in the 1970s and 1980s and now obsolete would be replaced with new state-of-the-art computer equipment and software. These computers and computer equipment are all located in the computer subsystem (Figure 4). The replacement computers, monitors, keyboards, and storage devices as well as some of the replacement software are expected to be general-purpose, vendor supplied, off-the-shelf equipment.

The Proposed Action will be completed in two phases. Phase 1 of the SLEP includes the replacement of data storage equipment (tape and disk drives), computer monitors, and keyboards associated with the main mission computer. Phase 1 will also replace the minicomputer, monitor, and keyboard that processes information to the radar system to control radar transmission and reception and two test sets that troubleshoot and test printed circuit boards



EXPLANATION

Unchanged

Proposed to be replaced by Air Force Service Life Extension Program

Solid State Phased Array Radar System Major Components

Figure 4

located in the radar subsystem. Phase 2 will replace the main mission computer (CYBER 170) and computer software.

Service Life Extension Program, Phase 1

Under Phase 1, the following computers, computer monitors, keyboards, and storage devices would be removed and replaced.

- Radar Controllers
- Tape Drives
- Disk Drives
- Communication Processor
- Graphic Display Consoles.

In addition, two pieces of test equipment, the Solid-State Module Test Set and the Digital Module Test Set would be replaced under Phase 1.

Radar Controllers

Two radar controllers (Figure 5) would be replaced at each location. The general appearance of the radar controller as shown on Figure 5 may vary from site to site. One radar controller is on-line and the second is on standby. Each radar controller is a general-purpose computer. The radar controller sends commands and processing parameters for each radar action to the receiver-exciter in the radar subsystem, with an information copy to the signal processors. Target data received by the radar subsystem is returned to the computer subsystem through the radar controller. In addition, the radar controller monitors the cooling of the antenna elements. This computer is currently a MODCOMP II computer system that will be replaced with a supportable MODCOMP III system. Because the MODCOMP III computer is faster, minor software changes are required to handle the increased processing speed.

Tape Drives

Six tape drives (Figure 6) would be replaced. The general appearance of the tape drives as shown on Figure 6 may vary from site to site. The tape drives support on-line history data recording, simulation, and data storage. Tape drive equipment is a long-term data storage system that allows changes in the computer software to be transported between locations. The tape drives also store mission software, simulation data, and mission data that must be maintained/archived for long periods.

Disk Drives

Six disk drives (Figure 7) would be replaced. The general appearance of the disk drives as shown on Figure 7 may vary from site to site. The disk drives support the storage of computer programs, permanent data, and checkpoint files

Figure 5. Radar Controllers

Figure 6. Tape Drives

Figure 7. Disk Drives

as well as provide space for the storage of real time operational data. The disk drive is a short-term data storage system used by the main mission computer to perform day-to-day operations and also gives long term storage of computer program source code.

Communication Processors

Three communication processors known as network processing units would be replaced. The network processing units send advanced data communication control procedures and computer format messages to external communication links, providing the interface between the main mission computer and the outside world. One of these units provides the interface between the off-line mission computer and a keyboard and monitor used as an interactive time-share terminal for off-line processing of data and programs.

Graphic Display Consoles

Five graphic display consoles (Figure 8) would be replaced. The general appearance of the graphic display console as shown on Figure 8 may vary from site to site. The current graphic display console has a cathode ray tube display, a lightpen, a keyboard, an audible alarm, and a hardware panel for the electronic controls.

Figure 8. Graphic Display Console

The graphic display console is a raster-type display with a square viewing area of 14 by 14 inches. A raster display uses a group of closely spaced parallel lines to project images on a cathode ray tube. Radar operators use the graphic display consoles to make data inquiries and conduct real time data analysis. The graphic display console displays mission and maintenance control tables and graphs and is capable of displaying vectors, alphanumeric characters, and special symbols.

Test Sets

Two pieces of off-line electronic test equipment are to be replaced. These include the Solid State Module Test Set (Figure 9) and the Digital Module Test Set (Figure 10). The appearance of these test sets as shown on Figures 9 and 10 may vary from site to site. The Solid State Module Test Set is used to troubleshoot and test the solid state modules from the radar antenna. The Digital Module Test Set is used to troubleshoot and test printed circuit boards found in the beam steering unit, receiver-exciter, and signal processors.

Phase 1 Timeline

In order to maintain the day-to-day operations of the SSPARS and minimize the risk to the mission, the Phase 1 computer equipment changes will not be completed simultaneously. Phase 1 will be implemented by three rotations per

Figure 9. Solid State Module Test Set

Figure 10. Digital Module Test Set

site over a 2-year period. Approximately 45 days will be required for each rotation. The tape and disk drives, Network Processing Unit, Digital Module Test Set, and Solid-State Module Test Set will be replaced during one rotation. The Radar Controllers and the Graphic Display Consoles will be replaced separately during the other two rotations. During each rotation, the new equipment will be installed and checked out before the existing computers are removed. Each rotation would require a work crew of approximately 20 engineers and technicians.

SLEP Phase 1 replacement actions would reduce operating and maintenance costs by providing a common hardware and software baseline at the three installations. The SLEP Phase 1 will be designed to meet mandated USAF and Department of Defense (DOD) open system standards and compliant software requirements (i.e., Defense Information Infrastructure Common Operating Environment requirements).

Service Life Extension Program, Phase 2

Under Phase 2 of the Proposed Action, the main mission computer (CYBER 170) will be replaced along with the computer software. The main mission computer (Figure 11) is approximately 18 feet in length, 6.5 feet high, and 4.5 feet wide. The general appearance of a main mission computer as shown on Figure 11 may vary from site to site. There are two main mission computers, one is on-line and the other is in standby mode. The main mission computer contains a large number of printed circuit boards that are interconnected with wiring harnesses (Figure 12). These computers generate a large amount of heat and are mechanically cooled using approximately 150 pounds of hydrochlorofluorocarbon (HFC) refrigerant (i. e., Refrigerant R-401a). The main mission computers contain the mission software required for the operation, data processing, and communication tasks associated with the missile warning and satellite surveillance missions. The replacement computer equipment and computer software will be state-of-the-art computer systems that use microprocessors.

Phase 2 Timeline

In order to maintain the day-to-day operations of the SSPARS and minimize the risk to the mission, the replacement of the main mission computers and computer software would be installed and checked out before the existing main mission computers are removed. The computer replacement would require a work crew of approximately 20 engineers and technicians.

SLEP Phase 2 replacement actions would reduce operating and maintenance costs by providing a common hardware and software baseline at the three installations. The SLEP Phase 2 will be designed to meet mandated USAF and DOD open system standards and compliant software requirements (i.e., Defense Information Infrastructure Common Operating Environment requirements).

Figure 11. Main Mission Computer

Beale AFB, California

The existing PAVE PAWS facility at Beale AFB has been operational since 1980. Hardware and software replacements to the SSPARS would be required as previously addressed. No other changes to the radar, support structure, or personnel operating and supporting the site would be required.

Cape Cod AFS, Massachusetts

The existing PAVE PAWS facility at Cape Cod AFS has been operational since 1979. Hardware and software replacements to the SSPARS would be required as previously addressed. No other changes to the radar, support structure, or personnel operating and supporting the site would be required.

Clear AFS, Alaska

The existing BMEWS facility at Clear AFS has been relocated from Eldorado, Texas, and is scheduled to become operational in January 2001. Hardware and software replacements to the SSPARS would be required as previously addressed. No other changes to the radar, support structure, or personnel operating and supporting the site would be required.

Figure 12. Main Mission Computer (inside cabinets)

DESCRIPTION OF ALTERNATIVES

SLEP with Shielding Alternative

Under the SLEP with Shielding Alternative, SLEP would be implemented as described under the Proposed Action. The barrier would be constructed in the path of the radar beam between the radar antenna face and the population so that the barrier would absorb some of the side lobe RF energy. The barrier would be constructed as an earthen barrier, screen barrier, tree barrier, or some combination of the three. The following paragraphs describe each type of barrier.

Earthen Barrier

Because the earth absorbs and reflects electromagnetic energy, and the attenuation is very high at the frequencies used by the SSPARS, an earthen barrier could be an effective shield against RF energy. Based on the concept of optical shadowing (that the radar wave's side lobe would be cut off or absorbed by the berm), the shielding factor of the berm could reduce exposure from the side lobe.

Screen Barrier

Because a grounded copper wire screen with a mesh size of approximately 2 inches could be an effective reflector of RF energy at SSPARS frequencies, a copper mesh screen could distort the electric field and possibly reduce side lobe energy.

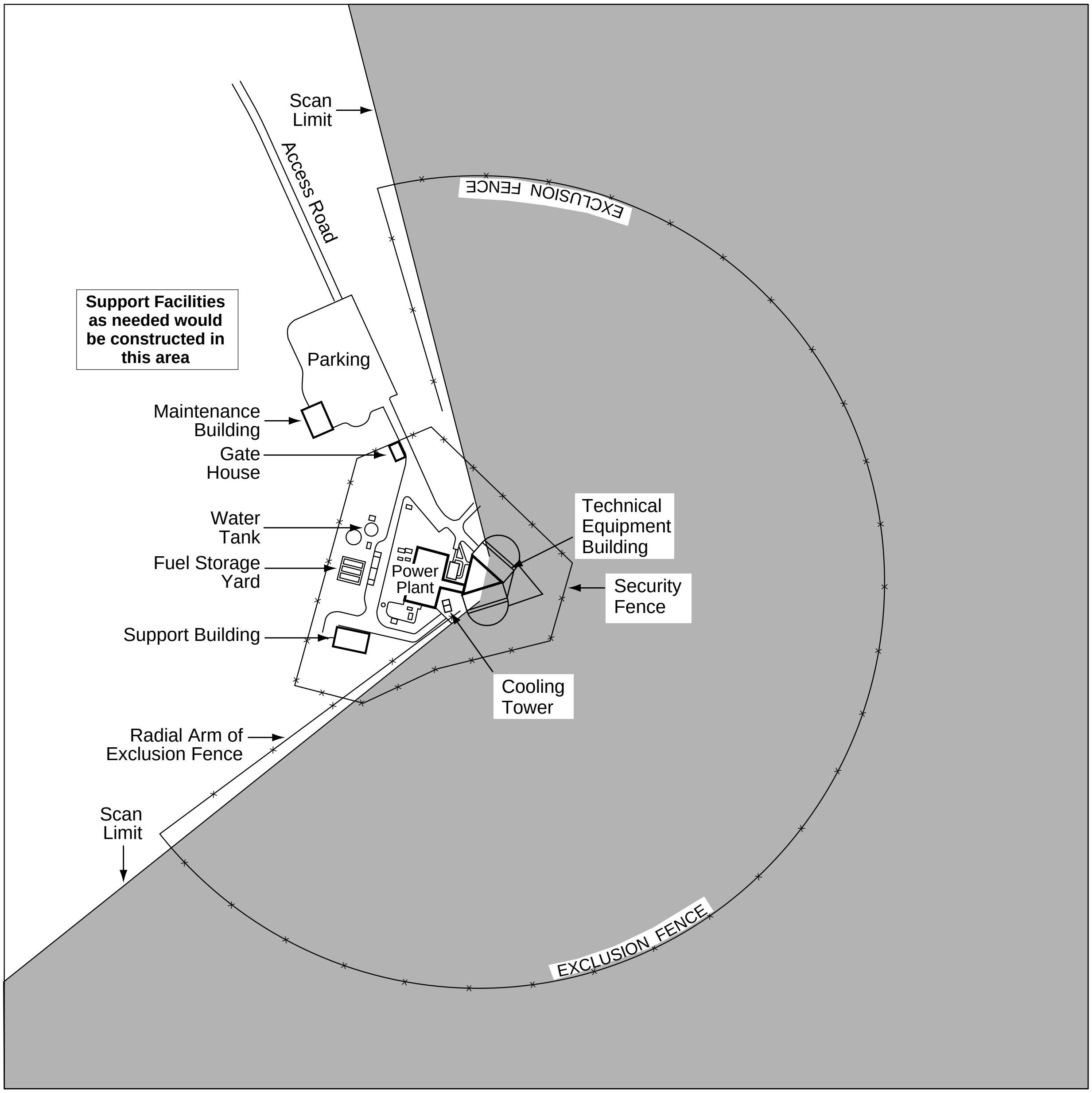
Tree Barrier

The trees growing near the SSPARS facilities also contribute to shielding. This shielding effect could be improved by the addition of suitable trees at appropriate locations.

Relocation Alternative

Under this alternative a new SSPARS facility (See Figure 3) would be constructed to replace an existing PAVE PAWS or BMEWS installation. Once the new SSPARS facility was operational and approved, the existing PAVE PAWS or BMEWS radar would be deactivated. Buildings on the deactivated installation would be maintained in a condition that would facilitate future use (caretaker status). Radar equipment from the deactivated facility would be removed. The removed radar equipment would be stored at an off-site location for reuse on other existing SSPARS facilities, sold, recycled, or disposed of in a landfill.

For the Relocation Alternative, approximately 50 acres of land with an unobstructed horizontal line-of-sight would be required for the SSPARS facility. An additional 50 acres would be required for supporting facilities and infrastructure (Figure 13).



EXPLANATION

Scan area/direction out to approximately 3,000 nautical miles

Not to Scale

Relocation Alternative, Conceptual Solid State Phased-Array Radar System Installation

Figure 13

The following sections describe the activities associated with both construction and long-term operation of a new SSPARS facility at a new location.

Construction

Trees situated within 300 feet of the new facility would be cut down to provide visibility for security purposes. Based on the design of current facilities, a new structure of approximately the same size and dimensions would be constructed. The building footprint would be approximately 14,000 square feet, and the structure would be 110 feet tall. A communications antenna approximately 30 feet high would also be installed. A security fence would be erected at a distance of approximately 200 feet from the facility. A 100-foot by 100-foot drive and parking lot would also be constructed for the radar facility.

Supporting facilities and infrastructure would be constructed as required to provide necessary support to the SSPARS facility. Typical support activities requiring facilities include administration, security, fire protection, civil engineering, electrical power generation, housing, recreation, logistics, vehicle maintenance, and storage. In addition, adequate infrastructure for vehicle access, water, sanitary sewer, heating, electricity, fuel, solid waste, and the handling, storage, and disposal of hazardous materials and waste would be required. A list of typical facilities and infrastructure for the SSPARS facility is provided in Table 1.

Operations

It is estimated that a minimum of 100 personnel would be required for all SSPARS facility operations (military and contractor personnel). This total includes administration and management personnel as well as staff for three shifts. Of these, approximately 75 would be associated with radar operations. Water would be required for equipment cooling, fire protection, and consumption.

If required, water wells would be drilled to provide water at an expected capacity of 1,500 gallons per minute (gpm). If sanitary sewer service were not available in the region, septic tanks and leach fields, to be situated downgradient of any new water wells would provide wastewater collection and treatment. The SSPARS facility requires 1.8 megawatts of electricity for normal operations. A radiation hazard zone 50 feet from the new building and extending in a 240 degree arc surrounding the SSPARS would be fenced for security and safety reasons.

Table 1. Typical Facility/Infrastructure, SSPARS Facility

Facility/Infrastructure	Approximate Size
Administration Building	7,500 gsf
Dining Facility	10,000 gsf
Dormitories	100,000 gsf
Civil Engineering Operations and Maintenance	10,000 gsf
Fire Protection	7,000 gsf
Post Office	600 gsf
Multi-purpose Recreation Center	10,500 gsf
Hazardous Materials Storage	3,000 gsf
Supply	5,000 gsf
Vehicle Maintenance	5,000 gsf
SSPARS	70,000 gsf
Consolidated Club	6,000 gsf
Outdoor Recreation Pavilion	800 gsf
Water Supply	80,000 gpd
Waste Water	60,000 gpd
Solid Waste	1,000 lbs/day
Electricity	150 MWH/day

gpd = gallons per day
gsf = gross square feet
lbs/day = pounds per day
MWH/day = megawatt hours per day
SSPARS = Solid State Phased-Array Radar System

Source: Real Property Records, Clear AFS, Alaska
Real Property Records, Cape Cod AFS, Massachusetts
Air Force Handbook 32-1084, Facility Requirements

Regional Considerations of Relocation

Locations considered for relocation of the SSPARS facility must be capable of providing missile warning with respect to sea-launched ballistic missile and ICBM attacks against both the United States and Canada. Criteria for the siting and operation of a SSPARS facility include:

- Availability of property in descending order of priority: DOD property, other federal property, state and municipal property, and privately owned property
- An unobstructed horizontal line-of-sight view
- Impact to local residents
- Consideration of fuel and ordnance hazards
- Interference to nearby home entertainment devices (e.g., radio, television) and electronics
- Consideration of proximity of airfields, aircraft approach patterns, and aircraft flying restrictions

- Availability of existing access roads, utility systems, communications systems, and other personnel necessities (e.g., housing, transportation, schools, churches, recreational facilities)
- Cost of site preparation.

If a relocation alternative is chosen, an EIS would have to be prepared to identify alternate locations, and a site-specific analysis for the relocation effort would be required. Planning, siting, compiling site specific environmental documentation, land acquisition and design would require several years to complete.

Spare Components Alternative

The Spare Components Alternative would require that equipment manufacturers reproduce and provide the necessary “spare” parts to continue operating the SSPARS facilities. Implementation of this alternative would require the setting up of new production lines involving the re-tooling to meet requirements for sustaining the SSPARS equipment. These production lines would require research and development efforts to re-establish technology, and personnel training to make them operational. In addition, the production lines would be operated only to meet short-term production requirements of the SLEP, as there would be no commercial market for the manufactured components. Therefore, the government would be required to absorb the total cost of production.

No-Action Alternative

The No-Action Alternative involves not implementing the proposed SLEP equipment replacement actions in the SSPARS at Beale AFB, Cape Cod AFS, and Clear AFS. Current operations supporting the missile warning and satellite surveillance missions would continue at these facilities until failure of irrecoverable system components occurred. The actual failure time is dependent upon the failure rate of computer components and the availability of spare parts.

Postponing or not implementing the necessary SLEP modernization actions would eventually cause the deactivation of the SSPARS and placement of the site under long-term caretaker status. The personnel currently employed or stationed at each site would be replaced with a caretaker staff of approximately 10 individuals. Caretaker activities would consist of resource protection, ground maintenance, limited operation of existing utility systems, and building maintenance. No other activities/missions would be performed on the property. The future levels of maintenance would be as follows:

- Maintenance of structures to limit deterioration
- Isolation or deactivation of utility distribution lines on site
- Limited maintenance of roads to ensure access
- Limited grounds maintenance of open areas to eliminate fire, health, and safety hazards.

The No-Action Alternative is in effect the deactivation alternative as the existing SSPARS would no longer operate.

DESCRIPTION OF REASONABLE FORESEEABLE FUTURE ACTIONS NOT PART OF THE PROPOSED ACTION BUT RELATED TO CUMULATIVE IMPACTS

Cumulative impacts result from "the incremental impact of actions when added to other past, present, and reasonable foreseeable future actions regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (Council on Environmental Quality, 1978).

Three separate actions have been identified that will be analyzed as they relate to cumulative impacts. These actions include:

- Future modification of the Defense Satellite Communications System (DSCS) antenna at Cape Cod AFS,
- Potential deployment of the National Missile Defense System which would include radar upgrades at Beale AFB, Cape Cod AFS, and Clear AFS to support the Upgraded Early Warning Radar, and
- Potential deployment of a Milstar fixed communication control station at Beale AFB and Cape Cod AFS.

Descriptions of these actions are provided in the following paragraphs.

Future Modification of the Defense Satellite Communications System Antenna

The U. S. Army proposes to modify a fixed communication antenna at Cape Cod AFS that supports the DSCS. The fixed communications antenna supports communication with North American Treaty Organization (NATO) IV, and SKYNET geosynchronous satellites.

The fixed communications terminal antenna and Electronic Equipment Building would be modified. Modifications to the antenna would include constructing a chiller pad, mounting two chillers, and providing power to the chillers. The communications terminal equipment in the Electronic Equipment Building would be replaced. Replacement of the existing equipment would require modification to the existing equipment racks, modifications to the existing power, modifications to the controlled heating and air conditioning system, and changes to the raised flooring system to accommodate a new Electronic Equipment Room.

Potential Deployment of the National Missile Defense Upgraded Early Warning Radar at Beale AFB, Cape Cod AFS, and Clear AFS

In July 2000, the Ballistic Missile Defense Organization (BMDO) finalized the National Missile Defense (NMD) Deployment EIS that identified and addressed potential environmental impacts resulting from deployment of an NMD system, which includes Upgraded Early Warning Radar (UEWR).

The UEWR could be one of the two main sources of missile launch and tracking information. The UEWR could use existing PAVE PAWS radar sites. These sites would be upgraded with new computer system hardware and mission software to provide more efficient and accurate acquiring, identifying, and tracking ability and to be able to effectively communicate with other NMD elements.

The UEWR would be able to search for different types of missiles, distinguish hostile objects such as warheads from other objects, and provide this data to other NMD elements using improved communications systems.

If a decision is made to deploy NMD, implementation of the UEWR at existing PAVE PAWS sites is contingent upon the outcome of the USAF SLEP EIS.

Potential Deployment of a Milstar fixed communication control station at Beale AFB and Cape Cod AFS

Milstar may be the next generation military satellite communication system, designed to serve the National Command Authority and the Unified and Specified commanders and their operational forces. Milstar could be the Department of Defense's core command and control communication system for the U. S. strategic and tactical combatant forces in hostile environments well into the next century. These capabilities would be provided by the use of extremely high frequency (EHF) and advanced processing techniques.

The Milstar system is comprised of the Space Segment, Mission Control Segment, and the Terminal Segment. The Space Segment would consist of a cross-linked constellation of satellites to provide worldwide coverage. The Mission Control Segment would control Milstar satellites on orbit from several mobile control stations and a fixed site located at Schriever AFB, Colorado. The Terminal Segment includes fixed and mobile ground terminals. Fixed ground terminals are proposed for Beale AFB and Cape Cod AFS. Clear AFS currently operates a Milstar terminal segment.

The ground terminals would provide interoperable voice, facsimile, and data communication.