SECRET

History of ADCOM/ADC (U)

1 JANUARY–31 DECEMBER 1979

SECRET

CHAPTER II

BALLISTIC MISSILE SURVEILLANCE AND WARNING

Introduction

(U) The Ballistic Missile Surveillance and Warning System consisted of the Ballistic Missile Early Warning System (BMEWS); the Sea-Launched Ballistic Missile Detection and Warning System (SLBM D&W); the Perimeter Acquisition Radar Attack Characterization System (PARCS); the Defense Support Program (DSP); and contributing sensors from the Space Detection and Tracking System (SPADATS). Information gathered by these systems was transmitted to the Missile Warning and Display System in the Missile Warning Center of the NORAD Cheyenne Mountain Complex. There, attack characterization and assessment was made to determine the potential of a ballistic missile attack upon the U.S. and Canada and the information transmitted to the National Command Authority.

The 9 November Incident

(S-Dec1-9Nov99) For about three minutes on the morning of 9 November 1979 a test scenario of a missile attack on North America was, through a combination of anomalies and coincidences, transmitted from a test device (a Message Generator Recorder or MG/R) to the operations side of the 427M computer system in the Cheyenne Mountain Combat Operations Center. There it was processed as real information and displayed on missile warning consoles in the command post, and simultaneously transmitted to Hq SAC, the National Military Command Center, the Alternate National Command Center, and the National Emergency Airborne Command Post. About 8 minutes elapsed between the time the spurious data first appeared on displays and the time NORAD's assessed confidence that no strategic attack was underway was passed to the above command centers. Although the test data which appeared as real world information was almost immediately given a low confidence of being true, and thus senior defense officials and the President were not notified, precautionary alerting actions continued and several procedural and equipment failures in the system for alerting aircraft

units caused 12 fighters to become airborne. Public announcement of the incident aroused widespread public and Congressional interest not only in what happened but also in what was being done to prevent future such incidents. The specific and contributing causes of the false event therefore received extraordinary attention during the late months of 1979 and corrective actions continued into 1980.

(~~S~~-Dec1-15Dec99) Although the 427M system had been declared to have an Equivalent Operational Capability (EOC) in September 1979, which meant it was able to perform as well as the 425L and 496L systems it was replacing, considerable testing and software development remained before the system reached an Interim Operational Capability. Testing therefore continued alongside the operational environment. The IG noted that a situation had been created where, on the one hand, operations personnel lacked knowledge of the total system and were prone to accept test requirements uncritically; while, on the other hand, technicians did not fully understand the possible consequences of their testing activities as they related to the system's operations functions. The potential was there for an incident such as happened on the morning of 9 November.[1] The direct cause of the incident, however, was the inadvertent passage of test missile attack data from the MG/R test device into the 427M system. The MG/R had been used since March 1978 to test the 427M's Communication System Segment (CSS). With the insertion of test tagged tapes, it could simulate data coming from radar sites, through the CSS multiplexor (MUX) and into the 427M. On the morning of 9 November maintenance technicians were attempting to validate the MG/R's performance in preparation for a test later that day by interfacing it with the CSS's MUX, the front end of the 427M system. The CSS was then running in the hot/shadow mode, i.e., both Honeywell 6050 processors were running simultaneously and processing the same data. When they were unable to establish a good interface or "handshake" between the MG/R and the CSS using disk packs containing test tagged data planned for use in the upcoming test, the technicians chose a pack, one used successfully before, which contained an untagged mass raid tape known as the NJ scenario. When the disk pack was put on the MG/R there were conflicting indications as to whether or not a good interface had been established with the MUX. There was no inten-

tion to run the disk pack, and no evidence was found later that anyone pushed the run button on the MG/R, but the MG/R did transmit the untagged test data. (Had the operator been observing the oscilloscope he would have seen the run, but he was occupied elsewhere and not watching it.) Coincidently at this time, the Defense Support Program's primary circuit from the main ground station at Buckley AFB, Colorado, to the MUX failed momentarily, causing the MUX to poll the secondary circuit, which was configured to the MG/R for checkout. To stretch coincidence further, the last block of sequential numbers on messages coming into the MUX from Buckley had been 001, and the first block of numbers on the NJ scenario was 002, further indication the data was real. The untagged test data was processed, and began showing up on the NCOC console screens.[2]

(U) The 9 November incident prompted considerable interest on the part of the press, within the Congress, and at HQ USAF, the JCS, and OSD. In response to a number of inquiries about the brief alert, the OSD released details to the press. Air Force, JCS, and OSD officials visited NORAD soon after the event for briefings. The JCS produced a number of action items or directions for corrective action. As was routine for such an event, NORAD established an Operations Review Board (ORB) on 12 November. In late November, General Allen directed the Air Force Inspector General to visit the Cheyenne Mountain Complex to look at the ADCOM reorganization and the 9 November event.

(S-Decl-27Nov85) Press comment stimulated by the OSD news release evidenced concern about the general health of the air defense system,[3] but with the OSD announcement late in the month that the problem had been solved, interest wanned.[4] Briefings to Congressional members and their staffs carried through this theme: some weakeness had been discovered in the system, which were being corrected, but it was fundamentally sound. The incident had reinforced the belief that the system must have redundancies built in and that human judgment played a crucial role in such circumstances.[5] The "five minutes" reported in the press had been spent confirming beyond doubt that it was false, but in the meantime certain precautionary measures had been taken.[6]

(S-Revw-5Dec88) Meanwhile, the ORB confirmed that unintended output from the MG/R had caused the false event. Printouts from the device indicated the operator had acted

this phase, AFSC directed the program office to prepare a plan which fit that amount. Work ceased temporarily while AFSC awaited Air Staff reaction to its recommendation to terminate EPARCS, but with the early March direction to proceed, AFSC directed the project office to prepare such a program.51 HQ USAF subsequently requested the final configuration be pursued in three phases to make it compatible with approval of FY-80 and FY-81 budget requests. Phase I would extend the radar's range (using remaining FY-78 funds); Phase II would restore traffic capacity and improve impact prediction capability (FY-80 funds); and Phase III would increase traffic capacity (FY-81 funds).52 ADCOM reacted to this approach with concern that it might not insure the necessary measures were taken to preclude a degradation of present PARCS performance in traffic capacity, impact prediction accuracy and Spacetrack capability. The command also believed it mandatory that EPARCS site be able to pass data to the 427M system in Cheyenne Mountain on a real time basis.53 HQ USAF replied with assurance that the $20 million program would contain all the features ADCOM had identified.54

(U) The EPARCS program briefed to USAF 17 May and reflected in a change to the Air Force Program Management Directive for the system in early June called for a $13 million design-to-cost program (Phase II) for the basic work of extending the range of PARCS, and a $5 million option for enhancements. Two million had been spent on the contract definition phase. Total cost then was $20 million.55 In September, the Bell Telephone Labs was awarded a contract for Phase II.56 The PMD called for the work to be completed by December 1980. This schedule seemed threatened in early 1980 by a delay in the release by the Congress of $5 million appropriated in FY-80.57

Defense Support Program

(S-Decl 31 Dec 99) The Defense Support Program (DSP) was developed in the late 1960s to provide early tactical warning of ICBM launches and nuclear detonations. Initial operations began in 1972. The system consisted of three infrared operational satellites in 24-hour synchronous orbit, two large ground processing stations, one Simplified Processing Station (at Grand Island, Nebraska), and dedicated ground communications and user (NORAD, SAC,

National Military Command Center, and Alternate National Military Command Center) displays.

Satellites. (S-Decl 31 Dec 99) To the beginning of 1979 seven DSP satellites had been launched. Five

Sec. 1.4(a),Sec. 1.4(e),Sec. 1.4(g),Sec. 3.3(b) (4)

~~(S~~-Decl 31 Dec 99) In November 1978 HQ USAF approved launch of the eighth DSP satellite. Because of problems which had developed with Flight 2, plans called for Flight 8 to replace Flight 7, for Flight 7 to replace Flight 2 as the eastern hemisphere satellite, and for Flight 2 to be placed in orbital storage.59 After some delay due to problems with the Titan booster for the satellite, Flight 8 (IRON 7484) was successfully launched from the Eastern Test Range, Florida, at 1339Z, 10 June 1979.60 The Air Force Satellite Control Facility, Sunnyvale AFS, California, turned it over to ADCOM as an operational asset on 11 July.61 Flight 8 was the first of a new series of four satellites with the following major improvements: a high powered downlink which increased signal power for use with smaller ground atennas; a new security system (TSEC/CI-1 Command Security System or simply CI-1) which provided antijam and antispoof protection for ground to satellite communications; and a modi-

Sec. 1.4(a),Sec. 1.4(e),Sec. 1.4(g),Sec. 3.3(b) (4)

*~~(S~~-Decl 31 Dec 99) This program would be followed by three satellites of the Sensory Evolutionary Development Program (SED). They would have all the improvements mentioned above, plus over twice the number of

Sec. 1.4(a),Sec. 1.4(e),Sec. 1.4(g),Sec. 3.3(b) (4)

With the repositioning of Flight 7 to assume the orbit of Flight 2, and the assumption by Woomera of control over Flight 7 at 08/0233Z Aug, the three-satellite system was back to full operational capability. Flight 6

Sec. 1.4(a),Sec. 1.4(e),Sec. 1.4(g),Sec. 3.3(b) (4)

Ground Processing Stations. (S-Revw 1 Dec 2000) Improvements in sensor capabilities would bring an increase in the data load received at the ground stations. Processing capabilities would have to be improved, and the ground stations themselves and the communications network connecting them to recipients of detection and warning data made more survivable. In response to the increased demands which the Sensor Evolutionary Development (SED) satellite would place on ground station processing capabilities, a DSP Program Management Directive (PMD) change in early February 1979 directed AFSC to modify the Simplified Processing Station (SPS), the CGS, and the OGS by procuring a programmable preprocessor and a large software compatible computer. A request for contract proposal was released to prospective contractors in October 1979, but authority to proceed had not been given by the end of the year. It might take over a year to develop the preprocessors. SAMSO's best estimate in the pre-contract period was May 1983 for completion of the station upgrade.[64] Upgrade of the Ground Communications Network (GCN) connecting ground stations and data users proceeded concurrently with modernization of the stations. Designated GCN III, the improvement program would enhance survivability by providing alternative routing of operational DSP data (thus eliminating the Data Distribution Center at Buckley ANGB as a single point failure node), allow for additional data sources and users (for example, a link would be established with airborne users), provide redundant communications to preclude complete system outage due to hostile action of natural disaster, and give protection against electromagnetic pulse (EMP). GCN III improvements were to be divided into three parts to facilitate funding. To the end of 1979 only the first part, baseline improvements, had been funded. SAMSO released a request for proposal in March 1979 to the Technology Development Corporation, Sunnyvale, California. It was awarded a contract for approximately $14 million on 16 August. SAMSO planned to receive delivery of the first communications elements for GCN III in January 1982, but early contractor performance indicated that date would slip, perhaps significantly.[65]

(~~S~~-Decl 7 Feb 91) Survivability of the most vulnerable part of the DSP system, the ground segment, would also be enhanced by providing redundant processing facilities. ADCOM stated its requirements for minimum survivability during peacetime in Required Operational Capability (ROC) 3-77, issued in June 1977. As it evolved, ADCOM's recommended solution for pre-attack survivability was six single string SPSs with each facility capable of processing data on two missions simultaneously from one satellite. These SPSs would be transportable, highly automatic, and hardened against Electromagnetic Pulse (EMP). Subsequently, International Business Machines Corporation developed a prototype SPS (consisting of one antenna, one Satellite Communications Module, and one Data Processing Module) at its Westlake Facility in California. In the summer of 1978 the SPS was moved to Vandenberg AFB for development test and evaluation (DT&E). Surveys of potential operational sites for the system were also conducted in 1978; and in April Cornhusker Army Ammunition Plant, Nebraska, was selected. In December, following DT&E, the SPS was packed up and moved to a temporary location at Cornhusker for initial operational test and evaluation (IOT&E). A permanent site was being prepared nearby. ADCOM expected to use the system as a backup to the CGS, but it would also be moved overseas should the OGS fail.[66] (ADCOM surveys during 1979 caused it to chose San Vito AS, Italy, but it had not been approved by the end of 1979.[67])

(~~S~~-Decl 31 Dec 99) In early 1979, USAF actions regarding development of Mobile Ground Terminals (MGT) (equipment would be mounted on trucks) indicated to ADCOM that the MGT had replaced the SPS as the preferred mode for survivability of the DSP's ground segment. The command emphasized to USAF that the SPS provided pre-attack survivability in the near term, while the MGT provided near term trans- and post-attack requirements. Six mobile units would be required.[68] The USAF supported an initial force structure of six MGTs, but elected to go no further than the prototype SPS. USAF said "Long term DSP enhancements must be kept to the mobility operations of the MGT and a follow-on DSP satellite with more onboard processing and elimination of the overseas ground station."[69] Fully appreciative of the need to develop mobile terminals, and in compliance with a DSP Program Management Directive in late 1978, ADCOM prepared a Preliminary Operational Concept for

the MGT. But as attractive as the new system was, it was the first of its kind. It would depend upon high powered downlink data from satellites using a small eight-foot antenna, and use of the Defense Satellite Communications System and direct UHF to airborne command posts for communications. General Hill told Deputy Secretary of Defense C. W. Duncan in late March that the MGTs were expected to encounter many problems, and they would not be available until FY-83. Until then, he said, the near-term SPS system (consisting of a prototype SPS, and modification to the Multipurpose Facility, at Lowry AFB, CO,* and the Operational Support Module at Westlake, CA**) would provide survivability in case of natural disaster.70

~~(S-Revw 1 Dec 99)~~ As mentioned, the prototype SPS was moved from California to Nebraska in early December 1978 following DT&E. SAMSO accepted it in late December, and training of personnel,*** preparatory to the beginning of IOT&E continued into early April. IOT&E began on schedule 16 April and was to last 60 days.71 Midway through the test period two significant problems had already arisen: the SPS generated more false missile reports than specified in the test objectives; and the diagnostic computer program could not effectively isolate hardware problems, causing a higher failure rate than predicted in the test objectives. Although consideration was given to extending the IOT&E period through the end of June to permit use of a new software program, when that program was tested it proved unacceptable and was turned back to the contractor. Now there was no reason to extend the IOT&E period, and it was declared completed on 18 June.72 ADCOM and SAMSO agreed that a Follow-on Test and Evaluation (FOT&E) would be necessary to check out the new software program when it was returned. They differed, however, on who should sponsor it: ADCOM thought Air Force Test and Evaluation Center (AFTEC)

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*(U) The MPF was used for analysis, training, and software development and testing. It would receive an antenna.

**(U) The OSM would be converted from a logistics support module into an operational support module using SPS hardware and software.

***(U) OLAE of the 46 AERODW, ADCOM, was located at Cornhusker and consisted of about 60 personnel.

should manage it, and AFTEC and SAMSO thought ADCOM should.[73] ADCOM asked HQ USAF for management direction. It replied that the FOT&E should be conducted in two phases: Phase I would be AFTEC correction of major deficiencies which prevented an IOC, and ADCOM should manage Phase II by completing remaining testing and any future testing.[74] Essentially, four Category I (mission essential) deficiencies remained after IOT&E which required resolution before IOC could be declared. These could be corrected by November, SAMSO said, if planned improvements succeeded, but that command was also most anxious for ADCOM to accept turnover of SPS prior to its being moved to the permanent site at Cornhusker.[75] ADCOM preferred to accept the system only after all critical deficiencies had been corrected, but it also wanted the system moved to the permanent site before winter set in.[76] After negotiation, it was agreed ADCOM and Space Division (SD) would sign a conditional turnover agreement after SD had verified the SPS met ADCOM requirements at the temporary site. SD would then move the SPS to the permanent site and verify the system had not been degraded by the move. ADCOM would then accept turnover.[77] After signing of the conditional acceptance took place on 8 November, and next day the prototype SPS was moved to the permanent site. At the end of the year it was still undergoing FOT&E.[78] Because the system was still in a non-operational status, resource management responsibility for SPS was not transferred to SAC on 1 December in accordance with provisions of the ADCOM reorganization. OLAE, HQ ADCOM would remain responsible to HQ ADC until the system was fully mission capable, expected to be around the end of March 1980.[79]

NOTES

CHAPTER II - BALLISTIC MISSILE SURVEILLANCE AND WARNING

1. SSS (U), Col F.R. Wisneski, Command IG, to CC et al, "Summary of USAF/IG Inspection Report USAF Support to NORAD," 30 Jan 80, with 1 Atch: Summary (S-Decl 15 Dec 99) (Doc 162); TIG Report (S-Decl 15 Dec 99/Privileged Document), "Special Inspection of USAF Support to NORAD," PN 80-2056, 3-15 Dec 79, distributed 13 Jan 80, pp 9, 16 (Doc 163). An earlier briefing of IG findings to CINCNORAD, on 15 December, drew criticism from General Hill and his staff that it was hastily done and superficial. General Hill recommended the team return and complete the job. The IG agreed, but whereas it had formerly not planned to prepare a written report, now it decided to do so. On 15 January the Deputy IG for Inspection and Safety briefed CINCNORAD on the above report. It contained recommended corrective actions to which NORAD must officially respond in early 1980. (Briefing of the initial report by Col R. Nolan, AFIG, to CINCNORAD, 15 Dec 79 (Doc 164); SSS (U) Maj Gen B.K. Brown, DCS/Ops, NORAD, to NORAD/CC, "CINC Visit With USAF IG," 2 Jan 80, with Atch (C-Decl Jan 2000), "Talking Paper on USAF Special Inspection of NORAD/ADCOM," prep. by Maj P.E. Rose, IGY, ADCOM 2 Jan 80 (Doc 165).

2. TIG Report (S-Decl 15 Dec 99/Privileged Document), 13 Jan 80, pp 5-6; Rpt (FOUO), "MGR Operator Events" prep. by T/Sgt T.A. Howard, 14 Nov 79; Msg (S-Revw 23 Nov 99), Hq NORAD/DO to JCS/J3/C^{3}S, "False Indications at 09/1551Z Nov 79," 26/1650Z Nov 79 (Doc 166); Memorandum (S-Revw 19 Nov 99), for Dep Dir for Stra C^3 Systems and Dep Dir for Ops (Current Ops), JCS, from Col J.J. Kamp, Chief, NEACP, "NEACP Events in Response to Missile Threat Assessment Conference, 9 November 1979," 19 Nov 79 (Doc 167).

3. A collection of press articles is included as (Doc 168).

4. "False Alert of Missiles Sows Fear," Philadelphia Inquirer, 11 Nov 79, p 3; Msg (S-GDS 11/27/85), SecState to US Mission NATO and all NATO capitals, "Inf: Soviets and the False Missile Alert," 28/0022Z Nov 79 (Doc 169).

5. Memorandum for the Record (U), "Continuation of Congressional Briefings in Response to NORAD Alert Inquiries," prep. by Maj Pat Sweeney, OATSD (Legislative Affairs), 5 Dec 79 (Doc 170).

6. Msg (S-Decl 31 Dec 87), Hq NORAD/J-3 to ASD/C^3 I et al (personal for Dr. Dinneen, Lt Gen Shutler, and Lt Gen Dickinson), "Meeting Between Members of NORAD Staff and Sen. Hart," 20/2115Z Dec 79 (Doc 171).

7. Ltr (U) Col P.A. Deering, Dep Comdr for Data Automation, NORAD/ADCOM Combat Operations Center, to ADCOM/DO2, "Operational Review Board Status," 29 Nov 79, with 1 Atch: "FACC Ltr 28 Nov 79," (Doc 172); Msg (S-Revw 1 Dec 99), Hq NORAD/J-3 to JCS/C^3S, for Lt Gen Dickinson from Maj Gen Brown, "NORAD ORB Update," 29/1708Z Nov 79 (Doc 173); Msg (S-Revw 30 Nov 99), Hq NORAD/DO to JCS/J-3/C^3S/ WWMCS Evaluation Office, "False Indications at 09/1551Z Nov 79," 30/1956Z Nov 79 (Doc 174); Msg (S-Revw 5 Dec 88), NORAD/J-6 to Hq USAF /XOX, "Missile Warning Scenario Control," 05/0215Z Dec 79 (Doc 175); Background Paper on 9 November 1979 False Indications (S-Revw 30 Nov 99), OPR NORAD/DOPC (Maj Sapp), 26 Dec 79 (Doc 176); SSS (U), Lt Col K.E. Lager, Actg Dir, User/Interface Configuration/Control,DCS/Ops, NORAD/ADCOM/ADC, to NORAD/DO, "Action Item Management Book," 4 Jan 80, with 1 Atch (S-Revw 4 Jan 99), "Management Book Contents," (Doc 177).

8. Msg (U), Hq NORAD/DOPC to Hq ADCOS et al, "NORAD/ ADCOM Regulation 55-104, 12 Sep 79 "21/1930Z Dec 79; Msg (S-Revw 26 Dec 99), Hq NORAD/J-3 to JCS/J-3/C^3S, "Suspension of 427M Development Testing," 26/1415Z Dec 79 (Doc 178).

9. Msg (S-Revw 30 Nov 99), Hq NORAD/DO to JCS/J-3/ C^3S/WWMCS Eval Office, "False Indications at 09/1551Z Nov 79," 30/1956Z Nov 79 (Doc 174); Memorandum (C-Revw 15 May 99), from Col J.K. Lowe, Dir Air Def Ops, ADCOM/DOO, to President, ORB (Col Brandt), "Operations Review Board (PHASE III Report)," 14 Nov 79 (Doc 179); Memorandum (S-Revw 15 May 99), from Col W.H. Riley, Dir of Cmd and Con Systems, ADCOM/DOC, "Operations Review Board (PHASE III Report)," 16 Nov 79 (Doc 180); Msg (S-Revw 21 Nov 99), Hq ADCOM/DOO to all NORAD Regions et al, "Unit Response to NAWS / NORAD Alert Warning System / Warning Alert," 21/2200Z Nov 79 (Doc 181); Msg (S-Revw 28 Nov 99), Hq NORAD/DO to JCS/J3,

personal for Lt Gen Shutler from Maj Gen Brown, "Missile Attack Warning," 29/0001Z Nov 79 (Doc 182); Msg (S-Revw 28 Nov 99), Hq NORAD/DO to AIG 7812, "Missile Attack Warning," 30/2307Z Nov 79 (Doc 183); Msg (S-Revw 7 Dec 99), Hq NORAD/DO to AIG 7812, "NAS Amber Warning Test," 07/1728Z Dec 79 (Doc 184); Msg (S-Revw 4 Dec 99), Hq NORAD/DOO at ALL NRs et al, "Missile Attack Warning," 18/1952Z Dec 79; Msg (S-Revw 15 May 98), Hq NORAD/DO to AIG 7812 et al, "Missile Attack Warning/Interim Emergency Change 1 to N/A Reg 55-19, Vol III, 15 May 79," 17/1800Z Jan 80 (Doc 185); Msg (U), Hq NORAD/J6 to JCS/C^{3}S, "Review of NORAD Alert System (NAS) Circuits," 25/2300Z Jan 80 (Doc 186).

10. Interest Paper (FOUO) on Proposed Relocation of the Command Section to the Cheyenne Mountain Complex, prepared by Lt Col P.M. Fleming, XPXP, 7 Jan 80 (Doc 187); Ltr (U), Gen J. E. Hill, CINCAD to Chairman JCS, n.s., 27 Dec 79 (Doc 188).

11. Msg (S-Decl 31 Dec 87), Hq NORAD/J3 to ASD/C^{3}I et al, personal for Dr. Dinneen, Lt Gen Shutler, and Lt Gen Dickinson, "Meeting Between Members of the NORAD Staff and Sen Hart," 20/2115Z Dec 79 (Doc 171).

12. Hist (S-Revw 31 Dec 99) of ADCOM, 1977-78, p 103 (material used S-Revw 96); atch 1, Background Paper on Missile Warning and Attack Characterization (S-Decl 8 Nov 85), prepared by Maj Wilkins/XPDW, 8 Nov 79, to SSS, Lt Col P. M. Fleming, Ch, Progs & Rqmts Div, XP to A/XP, "Talking Papers for 1979 CINC's Conference," 13 Nov 79 (Doc 189); Msg (S-Decl 13 Sep 99), CINCAD/CC to JCS/CJCS, "FY-81 CJCS Military Posture Statement," 18/2055Z Sep 79 (Doc 190); ADCOM Command and Control System Master Plan," (S-Revw 1 Jan 99), 30 Nov 79, pp 3-15, 3-16; Interest Paper on BMEWS Modernization (S-Decl 10 Jan 86), prepared by Maj D. L. Wilkins/XPDWG, 11 Jan 80 (Doc 191).

13. Msg (U), Hq AFSC/SDE to Hq ADCOM/XPD, "BMEWS Modernization," 15/2200Z Feb 79 (Doc 192); Msg (S-Revw 99), AFSC/CC to CSAF/CC, for Gen Allen from Gen Slay, "Enhanced Perimeter Acquisition Radar Characterization," 16/1516Z Mar 79 (Doc 193); Msg (S-Revw 31 Dec 91), SSO, ADCOM/CC to AFSSO USAF/CC, for Gens Allen, J. A. Hill, and Slay, from Gen J. E. Hill, EPARCS," 28/2220Z Mar 79 (Doc 194).

14. SSS (S-Decl 6 Feb 85), Maj Gen (CF) R. R. Barber, DCS/Plans and Programs, NORAD, to N/CC, "BMEWS Modernization," 16 Feb 79, with 1 atch, Msg (S-Decl 6 Feb 85), CINCAD/CV to Hq USAF/RD, "BMEWS Modernization . . .", 12/1800Z Mar 79 (Doc 195).

15. SSS (U), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CC et al, "BMEWS IBM 7090 Replacement," 18 May 79 (Doc 196).

16. Background Paper on BMEWS Modernization (U), prepared by Capt Harmon/XPDS, 27 Jul 79.

17. Hist (S-Revw 31 Dec 99) of ADCOM, 1977-78, pp 103-104 (material used S-Decl 96); Talking Paper on BMEWS Modernization (S-Decl 31 Dec 98), prepared by Capt Harmon/XPDS, 10 Jan 79 (Doc 197).

18. Background Paper on BMEWS Replacement Study (S-Revw 27 Nov 98), prepared by Capt Harmon/XPDS, 25 Apr 79 (Doc 198) to SSS (U), Col J. P. Foster, Dep Dir Missile and Space Defense, ADCOM, to A/XP, "BMEWS Replacement Study," 25 Apr 79.

19. Ltr (TS-XPX79-027-Revw 18 Jul 98), General James E. Hill, CINCAD, to Hon. H. R. Brown, SecDef, n.s., 13 Jul 79 (material used S). (U) The Air Force study supportive of BMEWS modernization was finally briefed to Dr. Dinneen, on 14 August. The study of various alternatives continued through the end of the year, however.

20. Ltr (U), Gen James E. Hill, CINCAD, to Hon Gerald P. Dinneen, Asst SecDef (C3I), n.s., 31 Jul 79, with 1 atch (S-Decl 30 Jul 85), "Ballistic Missile Early Warning System (BMEWS) Modernization vis-a-vis Phased Array" (Doc 199).

21. Talking Paper on BMEWS Modernization (S-Decl 31 Dec 98), prepared by Capt Harmon/XPDS, 10 Jan 79 (Doc 197); SSS (S-Decl 31 Dec 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CC, "BMEWS Improvement Status," 8 Jan 79 (Doc 200); SSS (U), Col W. R. Kenty, Asst DCS/Plans and Programs, ADCOM, to A/CC et al, "BMEWS Improvement Status," 22 Jan 79 (Doc 201).

22. SSS (U), Col W. R. Kenty, Asst DCS/Plans and Programs, ADCOM, to A/CC et al, "BMEWS IBM 7090 Replacement," 6 Sep 79 (Doc 202); Msg (S-Decl 20 Oct 85), CINCNORAD/CC to CSAF/CC, "BMEWS Modernization," 15/1730Z Oct 79 (Doc 203).

23. Msg (U), Hq AFSC/ACB to Hq USAF/ACB, "Proposed Deferral FY-80 BMEWS Modernization," 18/1435Z Sep 79; Msg (U), Hq ESD/ACB to Hq AFSC/ACB, "Deferral of FY 80-BMEWS Modernization Funding," 07/2008Z Sep 79; SSS (U), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CC et al, "BMEWS Modernization," 25 Oct 79, with 2 atch, Memorandum for Assistant Secretary of the Air Force (Research, Development and Logistics), from Gerald P. Dinneen, Principal Deputy, USDR&E, 15 Oct 79 (Doc 204); Memorandum for Assistant Secretary of Defense (C3I) (S-Decl 31 Dec 95), from Eugene H. Kopf, Principal Deputy Assistant Secretary of the Air Force Research, Development, and Logistics, "BMEWS Upgrade . . .", 16 Oct 79 (Doc 205).

24. Msg (S), Hq USAF/RDSD to Hq AFSC/SDE, "BMEWS Upgrade," 29/1430Z Nov 79.

25. Msg (U), Hq AFSC/SDE to Hq USAF/RDXP, "BMEWS Modernization Funding," 04/2004Z Dec 79 (Doc 206); Background Paper on BMEWS Modernization (S-Decl 10 Dec 85), prepared by Maj Wilkins/XPDW, 12 Dec 79 (Doc 207); Interest Paper on BMEWS Modernization (S-Decl 10 Jan 86), prepared by Maj Wilkins/XPDWG, 11 Jan 80 (Doc 191).

26. Ltr (S-Revw 5 Dec 98), Maj Gen W. C. Moore, VCINCAD (for Gen J. E. Hill), to Hq USAF/PA, "FY 82-86 Consolidated Guidance," 6 Dec 79.

27. This background information has been taken from CONAD/ADC histories for the period 1971-78.

28. Msg (U), 6 MWS/DO to Hq ADCOM/DOFW, "PAVE PAWS Reliability and Availability Demonstration," 03/1830Z Jan 79; SSS (U), Col L. J. Johnson, Dir of Space and Missile Warning Operations, ADCOM, to A/DO, "Current Status of Otis DT&E and IOT&E," 13 Mar 79; Msg (U), 6 MWS/XPD to ADCOM/XPD, "AN/FPS-115 (PAVE PAWS) Initial Operation Test and Evaluation (OT&E)," 02/1825Z Mar 79.

29. Msg (U), OSAF/OIP to Hq AFSC/OIP et al, "PAVE PAWS East Announcement," 05/2230Z Apr 79; Msg (U), ESD/OCL to Hq AFSC/DLWM, "PAVE PAWS-Otis AFB Status," 12/1945Z Apr 79.

30. ADCOM DCS/Plans Historical Report (XPDS), Jan-Jun 79.

31. Msg (U), Hq ADCOM/XO to ESD/OCL, "PAVE PAWS Submission," 15/2000Z Jun 79 (Doc 208).

32. Msg (S-Decl 1 Oct 89), Hq ADCOM/DOF, to NMCC/ Surveillance Officer, "Status of PAVE PAWS Missile Warning Data," 06/2310Z Jul 79 (Doc 209).

33. Msg (U), Hq ADCOM/DO to Hq USAF/XOO et al, "Status of PAVE PAWS Missile Warning Data--The 60 Day Dual Operation," 31/2050Z Jul 79.

34. Interview (U), John W. Dennison, ADCOM/HO, with Mr. F. E. Brooke, ADCOM/DEMUS, 21 Sep 79; Msg (S-Revw 31 Dec 99), CINCAD to AIG 951, "Commander's Semi-annual Summary, 1 Apr-30 Sep 79," 16/0105Z Oct 79; Msg (U), CINCAD/CV to AFSC/CV, "Otis PAVE PAWS Power Problems," 09/1350Z Aug 79 (Doc 210); Msg (U), Hq ADCOM/DE to ESD/DE/XP, "Otis PAVE PAWS Electric Generation Plant," 14 Aug 79; Msg (U), Hq ADCOM/DO to Hq USAF/XOX/XOO/XOKS, "Otis PAVE PAWS Power Problems and Continued Operation of AN/FSS-7's at Ft Fisher AFS NC and Charleston AFS ME," 15/1945Z Aug 79 (Doc 211). (U) Citizens groups had protested the building of both sites because of alleged health hazards posed by microwave radiation emanating from the radars. Lawsuits were filed on both coasts to halt construction. Those wishing to follow the environmental issues involved are directed to History Electronics Systems Division, (S-Decl 31 Dec 2007), Air Force Systems Command, 1977, pp 183-187; and, History of ESD (S-Revw 31 Dec 99), 1978, pp 35-44.

35. Msg (U), CINCAD/CV to AFSC/CV, "Otis PAVE PAWS Power Problems," 09/1350Z Aug 79 (Doc 210).

36. Msg (U), Hq AFSC/SO to CINCAD/CV, "Otis PAVE PAWS Power Problems," 20/1212Z Aug 79.

37. Msg (U), ESD/OCL/DE to Hq ADCOM/XPD, "PAVE PAWS-Otis AFB Power Plant," 28/1400Z Aug 79, atch 6, "6 MWS Power Plant Problem," to Staff Action Memorandum (U), from XP (Col Kenty), to XPD, XPX, and XPC, "PAVE PAWS Deficiencies," 17 Oct 79; Interest Paper on 6th Missile Warning Squadron (Otis AFB) PAVE PAWS (S-Decl 1 Oct 89), prepared by CMSgt Martin, ADCOM/XPDW, 17 Oct 79 (Doc 212).

38. Msg (S-Decl 31 Oct 89), Hq ADCOM/DO to Hq USAF/ XOO/PAX/ACB, "PAVE PAWS Missile Warning Data," 07/1645Z Sep 79 (Doc 213); Msg (U), CINCAD/CV to Hq USAF/RDS/XOK/XOO/XOX, "Otis PAVE PAWS Power Problems," 10/1840Z Sep 79 (Doc 214); Talking Paper on PAVE PAWS (S-Decl 27 Sep 87), prepared by Maj Nelson, ADCOM/XPDW, 26 Sep 79 (Doc 215); Msg (U), Hq ADCOM/DO to Hq USAF/XOO/PAX/ACB, "Otis PAVE PAWS and AN/FSS-7 Sixty Day Dual Operations," 28/2145Z Sep 79 (Doc 216).

39. Interest Paper on 6th Missile Warning Squadron (Otis AFB) PAVE PAWS (S-Decl 1 Oct 89), prepared by CMSgt Martin, ADCOM/XPDW, 17 Oct 79 (Doc 212).

40. Msg (U), Hq ADCOM/DO to Hq USAF/XOO/PAX/ACB, "Termination of Otis PAVE PAWS and AN/FSS-7 Sixty Day Dual Operations," 07/1710Z Nov 79 (Doc 217).

41. Talking Paper on Otis PAVE PAWS (U), prepared by Maj L. P. Nelson, ADC/XPDW, 14 Jan 80 (Doc 218).

42. Ltr (U), Col R. R. Atkinson, Jr., Commander 14MWS (ADCOM), to CINCAD/CV, "14 MWS Quarterly Activity Report for the Period 1 January-31 March 1979; Msg (U), Hq USAF/XOO/PAX to Hq ADCOM/DO/AC, "Extension of AN/FSS-7 Operations at Charleston AFS, ME and Ft Fisher AFS, NC," 18/1400Z Apr 79; SSS (U), Lt Col F. L. Nance, Director of Space and Missile Warning Operations, DCS/Ops, ADCOM, to DO, "Impacts of AN/FSS-7 East Coast Extension," with 2 atchs (Doc 219); Msg (U), Hq USAF/XOO/PAX/ACB to Hq NORAD/DO/AC/XP, "Extension of AN/FSS-7 Operations . . . ", 20/1531Z Jun 79 (Doc 220); Msg (U), Hq USAF/XOO/PAX/ACB/XOX/AC/XP to Hq ADCOM/DP/AC/XP, "Continued Operation of AN/FSS-7 Radars . . . ", 07/1330Z Sep 79 (Doc 221); Msg (U), Hq ADCOM/DO to Hq SAC/AC/SX, "Continued East Coast FSS-7 Operation," 16/2205Z Nov 79 (Doc 222); Msg (U), Hq SAC/ACB to Hq ADCOM/CC/ACB, "Continued East Coast FSS-7 Operation," 20/2300Z Nov 79 (Doc 223); Msg (U), CINCAD/CS to CINCSAC/CS, "East Coast AN/FSS-7 SLBM Detection and Warning Radar Continued Operation," 19/1420Z Nov 79 (Doc 224).

43. Msg (U), CINCNORAD/CC to Det 5 14 MWS/CC and Det 6 14 MWS/CC, "Special Recognition," 21/2000Z Dec 79 (Doc 225).

44. Hist (S-Revw 31 Dec 99) ADCOM, 1977-78, pp 119-120 (material used S-Revw 98); SSS (S-Decl 1 Dec 98), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CC et al, "Position Paper on PARCS," 10 Jan 79, with 1 atch, "Position Paper" (this paper references Hq ADCOM/CV msg to USAF, "FY-79 O&M Funding Distribution," 06/1501Z Dec 78.) This paper makes the point that although PARCS had marginal value as an ICBM sensor, and it was in that context that previous studies had examined its usefulness, it should be retained for SLBM coverage of northerly ocean areas and to provide satellite tracking support (Doc 226).

45. Msg (S-Decl 1 Dec 98), Hq ADCOM/XP to Hq USAF/RDQ, "EPARCS," 26/2145Z Dec 78 (Doc 227).

46. Msg (S-XGDS-3/91), AFSSO/AFSC/CC to AFSSO/CSAF/CC, for Gen Allen from Gen Slay, "EPARCS," 03/2330Z Jan 79 (Doc 228).

6555 ASTG, Cape Canaveral/LV, "DSP Launch Update," 02/2300Z May 79; Msg (S-Revw 1 Dec 98), AFSCF/SZB to SAMSO/CC, "DSP Orbital Report," 11/0915Z Jun 79; Msg (S-Revw 1 Dec 99), CINCAD to AIG 951, "Commander's Semi-annual Summary," 1 Apr-30 Sep 79," 16/1057Z Oct 79.

61. Msg (S-Revw 1 Dec 99), Hq ADCOM/DO to AFSC/SDO/SDS, "Flight 8 Turnover," 10/2325Z Jul 79 (Doc 237).

62. SSS (S-Decl 1 Dec 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CC et al, "Defense Support Program (DSP) Improvements Status," 24 Apr 79 (Doc 238); Msg (S-Revw 1 Dec 99), Hq ADCOM/DO to Hq TAC/DO, "CI-1 System," 28/1715Z Feb 79).

63. Msg (S-Revw 1 Dec 99), CINCAD/CC to Hq USAF/XOO/RDS, "DSP Operational Satellites," 08/0255Z Aug 79 (Doc 239).

64. SSS (S-Decl 31 Dec 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to CC et al, "Defense Support Program (DSP) Improvements Status," 24 Apr 79 (Doc 238); Msg (S-Revw 1 Dec 99), CINCAD to AIG 951, "Commander's Semi-annual Summary, 1 Apr-30 Sep 79," 16/1057Z Oct 79 (Hist File 22, Hist ADCOM/ADC, 1979); Msg (S-Revw 1 Dec 2000), CINCAD to AIG 951, "Commander's Semi-annual Summary, 1 Oct 79-31 Mar 80," 15/2130Z Apr 80 (Hist File 22, Hist ADCOM/ADC, 1979).

65. Ibid.; Atch 2 (S-Decl 25 Jul 91), "DSP Paper," to Ltr (U), Gen J. E. Hill, CINCAD to Hon G. P. Dinneen, AsstSecDef (C3I), N.S., 31 Jul 79 (Doc 240).

66. SSS (S-Decl 31 Dec 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM to A/DO, "Simplified Processing Station (SPS) Alternatives," 12 Jan 79, with 1 Atch, Msg (S-Decl 31 Dec 96), ADCOM/XP to Hq USAF/RDQ et al, same subject, 17/1930Z Jan 79 (Doc 241); Hist of ADCOM (S-Revw 31 Dec 99), 1977-78, pp 115-117 (material used S-Revw-96).

67. SSS (S-Decl 7 Feb 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/DO et al, "Simplified Processing Station (SPS) Overseas Site," 20 Feb 79, with 1 Atch, Msg (S-Decl 7 Feb 91), Hq ADCOM/XP to Hq USAF/PAX et al, same subject, 02/2125Z Mar 79 (Doc 242); Msg (S-Decl 27 Mar 85), Hq USAF/PAX to Hq ADCOM/XP, " . . . (SPS) Overseas Siting," 06/2000Z Apr 79; Msg (S-Decl 27 Mar 85), Hq ADCOM/XO to Hq USAF/PAX et al, " . . . (SPS) Overseas Siting," 02/2130Z May 79 (Doc 243); SSS (S-Decl 27 Mar 85), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/DO et al, " . . . (SPS) Overseas Siting," 10 Dec 79, with 1 Atch, Msg (S-Decl 27 Mar 85), Hq ADCOM/XP to Hq USAF/PAX

47. Msg (S-Revw 31 Dec 91), AFSSO/USAF/CC to AFSSO/AFSC/CC, for Gen Slay from Gen Allen, "EPARCS," 10/1300Z Mar 79 (Doc 229).

48. Msg (S-Revw 31 Dec 91), Hq AFSC/CC to CSAF, "EPARCS," 16/1516Z Mar 79.

49. Msg (S-Revw 31 Dec 91), SSO/ADCOM/CC to AFSSO/USAF/CC, for Gens Allen, J. A. Hill, and Slay, from Gen J. E. Hill, "EPARCS," 28/2220Z Mar 79 (Doc 230).

50. Msg (S-Revw 31 Dec 91), Hq AFSC/SDE to ESD/OC, "EPARCS," 16/1516Z Mar 79 (Doc 231).

51. Ibid.

52. Msg (U), Hq USAF/RDSD to Hq AFSC/OC, "EPARCS," 23/1600Z Mar 79 (Doc 232).

53. Msg (S-Decl 2 Apr 98), CINCAD/CC to Hq USAF/RD, "EPARCS," 11/1645Z Apr 79 (Doc 233).

54. Msg (S-Decl 2 Apr 98), Hq USAF/RD to CINCAD/CC, "EPARCS," 26/1350Z Apr 79 (Doc 234).

55. Msg (U), Hq AFSC/CV to Hq USAF/RD, "EPARCS," 07/1555Z May 79 (Doc 235); Msg (U), Hq USAF/XR to Hq ADCOM/XP, "PARCS Radar Modification, PMD R-Q8043(5)," 01/1500Z Jun 79 (Doc 236).

56. DCS/Plans and Programs Hist Rpt, (S-Decl 31 Dec 2009), XPDW, Jul-Dec 79, Tab C (material used U).

57. SSS (U), Brig Gen W. E. Lindeman, DCS/Plans, Policy and Requirements, ADC, to A/CS et al, "EPARCS Funding," 29 Feb 80.

58. Hist of ADCOM, 1977-78 (S-Revw 31 Dec 99), pp 111, 112 (material used (S-Revw 98)).

59. Ibid., p 112; Msg (S-Revw 2 Jan 99), Hq FTD/XO to Hq ADCOM/DOF, "DSP Deployment," 04/2030Z Jan 79; Msg (S-Decl 1 Dec 99), CINCAD/CC to Hq USAF/XOO/RDS/PAX, "DSP Launch Initiation," 15/1530Z Feb 79; Msg (S-Revw 31 Dec 79), CINCAD to AIG 951, "Commander's Semi-annual Summary, 1 Oct 78 - 31 Mar 79," 17/0045Z Apr 79.

60. Msg (S-Revw 1 Dec 98), SAMSO/SZD to ASTG, Cape Canaveral/LV, "DSP Launch," 31/2355Z Jan 79; Msg (S-Decl 1 Dec 99), CINCAD/CC to Hq USAF/XOO/RDS/PAX, "DSP Deployment," 07/2300Z Mar 79; Msg (S-Revw 1 Dec 99), SAMSO/SZD to

et al, " . . . (SPS) Overseas Siting," 17/1430Z Dec 79 (Doc 244).

68. SSS (S-Decl 31 Dec 99), Brig Gen W.E. Lindeman, DCS/Plans and Programs, ADCOM, to A/DO, " . . . (SPS) Alternatives," 12 Jan 79, with 1 Atch, Msg (S-Decl 31 Dec 96), Hq ADCOM/XP to Hq USAF/RDQ et al, 17/1930Z Jan 79 (Doc 241).

69. Msg (S-Decl 31 Dec 98), Hq USAF/RDS et al to Hq ADCOM/XP, "DSP Data Survivability Enhancements," 16/1845Z Feb 79 (Doc 245).

70. Ltr (S-Decl 17 Feb 85), Hon Charles W. Duncan, Jr., DepSecDef, 20 Mar 79; Ltr (S-Decl 28 Feb 85) (Doc 246), Gen J. E. Hill, CINCAD, to Hon Charles W. Duncan, Jr., DepSecDef, 20 Mar 79 (Doc 247).

71. Msg (S-Revw 31 Dec 79), CINCAD to AIG 951, "Commander's Semi-annual Summary, 1 Oct 78-31 Mar 79," 17/0045Z Apr 79 (Hist File 22, Hist of ADCOM, 1979); Msg (U), Hq USAF/XP/DO to Hq ADCOM/XP/DO, "PMD Clarification Request . . .," 27/1530Z Mar 79; Msg (U), Hq ADCOM/DOP to Hq SAC/NE/DOC, "Integration of SPS into CGPDS," 18/1815Z Apr 79.

72. Msg (S-Revw 1 Dec 99), Hq ADCOM/XP to Hq AFTEC/TE, "Request for SPS IOT&E Extension," 25/2200Z May 79 (Doc 248); Msg (S-Revw 1 Dec 99), AFTEC/CC to Hq ADCOM/XP/DO, "SPS IOT&E Extension," 01/1636Z Jun 79 (Doc 249); Msg (S-Revw 31 Dec 99); Hq ADCOM/XP to Hq AFTEC/TE, "Continued SPS Test Requirements," 12/1500Z Jun 79 (Doc 250).

73. Msg (S-Revw 1 Dec 99), AFTEC/CC to Hq ADCOM/XP/DO, "Termination of SPS IOT&E," 15/2030Z Jun 79 (Doc 251); SSS (S-Decl 14 Jun 91), Col L. L. Churchill, Spec Asst, (J5), Asst DCS/Plans and Programs (NORAD), to A/CV et al, " . . . (PMD) Change Request," 19 Jun 79 (Doc 252); Msg (S-Decl 14 Jun 91), CINCAD/CV to Hq USAF/RDS, " . . . (PMD) Change Request," 22/1730Z Jun 79 (Doc 253).

74. Ibid.; Msg (S-Decl 12 Jul 91), Hq USAF/XOO/RDS to CINCAD/CV, "Simplified Processing Stations," 12/1840Z Jul 79 (Doc 254).

75. Msg (S-Revw 1 Dec 98), SAMSO/SZJ to Hq AFSC/SDS, "Continued Simplified Processing Support," 01/1415Z Aug 79 (Doc 255).

76. Position Paper on SPS Turnover (S-Revw 31 Dec 79), Atch to SSS (S-Revw 31 Dec 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CO et al, "SPS Turnover Status Review," 20 Aug 79 (Doc 256).

77. SSS (U), Col W. R. Kenty, Asst DCS/Plans and Programs, ADCOM, to A/CC et al, "SPS Turnover Status Review," 14 Sep 79 (Doc 257); Msg (U), Hq SD/SZ to Hq ADCOM/XPD, " . . . (SPS) Turnover," 31/2300Z Oct 79 (Doc 258).

78. SSS (S-Revw 31 Dec 91), Brig Gen W. E. Lindeman, DCS/Plans and Programs, ADCOM, to A/CC et al, "SPS Turnover Status," 21 Nov 79 (Doc 259); Msg (S-Revw 1 Dec 99), OLA 2162CS/LGK to 216CS Buckley ANGB," (S) Move of the SPS to Permanent Site," 07/1310Z Nov 79.

79. Msg (S-Revw 1 Dec 99), CINCAD/CS to CINCSAC/CS/SX, "Management Transfer Date for OLAE Hq ADCOM Cornhusker AAP, NE," 16/2215Z Nov 79 (Doc 260).