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on 12 June.¹¹⁰ The termination agreement with Bell did include a provision for installation of Advance Data Communications Control Procedures (ADCCP) to increase the speed with which warning and assessment information was transmitted from the site to the NCMC.¹¹¹ What portion of the hardware and software work already done could be used with the PARCS remained to be determined; but with CINCNORAD approval in December, henceforth the system's primary mission would be first SLBM TW/AA, second ICBM TW/AA, and third SPACETRACK. PARC's strong suit was the unique coverage it gave of possible SSN-6 and SSN-8 launching areas in the Beaufort Sea, Baffin Bay and Davis Strait, and Hudson Bay, all areas behind BMEWS coverage.¹¹²

Assessment: The NORAD Cheyenne Mountain Complex

(U) The NORAD Cheyenne Mountain Complex was the hub of the TW/AA system. Its 427M Command and Control System processed sensor data and generated warning and attack assessment information for use by CINCNORAD in making his assessment to the NCA.* Developed and installed between 1969 and 1979, at a cost of approximately \$200 million, it had been troubled by schedule slippages and cost overruns.¹¹³ A comprehensive review in 1977 by an Air Force Independent Review Group recommended bringing the system to an Equivalent Operational Capability (EOC), equivalent to the capability of the system it was replacing, as soon as possible. ADCOM agreed to take over responsibility for system development and testing. The EOC date was scheduled for October 1978, but further delays were encountered, and the 720 hour operational demonstration of the system, which validated it could perform the minimum operational capabilities required, was not completed until 4 September 1979. Next day, CINCNORAD declared it had reached EOC. A good deal of testing and software development remained, but since an off-line computer had not been purchased in an effort to keep costs down, testing and operations went on side by side in the NCMC.¹¹⁴

The Aftermath of the 9 November 1979 False Missile Incident

(S-Dec 28 Jan 2000) Safeguards had been installed on the 427M to prevent the intermingling of test and real world data, but, nevertheless, on 9 November 1979 test missile attack data was processed from a test device called a Message/Generator Recorder (MGR) into the operational side of the system. CINCNORAD convened a threat assessment conference and a NORAD confidence of no threat was passed to the other command centers about five minutes after the threat data began showing on display consoles. Unfortunately, 12 fighters were launched due to technical deficiencies and procedural errors in the NORAD Alerting System (NAS) linking the NCMC and command posts of air defense fighter

*(U) 427M also supported other missions such as space surveillance and warning and communications processing.

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units. Delays in communicating the all clear to the National Emergency Airborne Command Post resulted in a decision by its crew to launch for survival. These events were observed, and press inquiries prompted OSD to issue a news release. The resulting publicity focused top level attention on the TW/AA system. The JCS and the USAF Inspector General examined NCMC operations and recommended a number of changes to improve the credibility and dependability of the TW/AA system. Efforts to incorporate these continued throughout 1980, and by the end of the year most had been completed.¹¹⁵ NORAD was unsuccessful in its efforts to identify the precise mode of failure of the MGR. General Hartinger emphasized to the JCS, however, that whether the cause was human error, computer error, or a combination of both, stringent controls were necessary to preclude a similar occurrence in the future.¹¹⁶

(S-Revw 1 Jan 2000) Efforts to improve control of interceptor launches took the form of procedural changes in the alerting process and technical improvement of alerting system equipment. The most significant procedural change was that henceforth the NCMC Command Director must secure CINCNORAD approval before ordering interceptors to launch for survival.¹¹⁷ Testing early in 1980 confirmed the NORAD Attack Alert System (NAAS), a subsystem of the NAS, was technically below standard and needed modernization.¹¹⁸ Intensified management efforts by NORAD, TAC, and the NORAD Regions did not appreciably improve its reliability, however, and by November NORAD had concluded the NAAS was even less reliable than originally believed.¹¹⁹ That month, American Telephone and Telegraph submitted a proposal to upgrade the system to 99.9 percent reliability; but for the near term, further procedural changes were instituted which would preclude any interceptors from starting, taxiing, or taking off as a result of a malfunction in the system's audio and visual indicators.^{**120}

(S-Revw 26 Dec 99) Also in response to the 9 November incident, NORAD stopped 427M testing from 22 December 1979 until 29 January 1980. During this time it briefed Hq USAF, JCS, and OSD staffs on what was needed to preclude future like events. When testing began again, only the most vital ones were conducted, always in a tightly controlled environment, and under the direction of a NORAD/ADCOM general officers.¹²¹ This conservative approach, while dictated by events, delayed efforts to clean up a backlog of some 2500 427M deficiency reports and modification requests. NORAD believed that in the long run the only way to complete the testing required to bring the system to IOC was to conduct such activity in an off-site facility.

^{*(S-Dec 13 Jan 2000)} If CINCNORAD could not be contacted in a timely manner, the CD would order the launch. NORAD Region Commanders also retained authority to flush aircraft for survival.

^{** (U)} Klaxons and different colored lights.

the contract manager, issued a letter contract to FACC in April for \$3.392M to purchase and lease equipment through FY-80.¹²⁷ FACC's cost proposal for the complete Firm Fixed Fee contract was \$8.9M for performance from April 1980 through September 1981. This was acceptable since it was about \$9,000 under the government's not-to-exceed price.¹²⁸ Equipment installation began 1 July. Delivery of leased computers from Honeywell Information Systems, Inc., the major subcontractor, and government furnished equipment proceeded on schedule. These equipments were installed and integrated with intercomputer processors, graphic processors, and associated interface adapters in time to meet the end of September IOC date.¹²⁹

(U) On 29 September General Hartinger officially opened the OSTF.¹³⁰ The facility was organized as the OSTE Operations Branch, 427M Operations Division, Directorate of ADP Systems, DCS/Communications, Electronics and Computer Resources. It consisted of 21 officers, airmen, and civilians for 24 hours a day, seven days a week operation.¹³¹ Installation of the remainder of the equipment continued through the end of the year on schedule. Software programs from the 427M operational system were transferred from the NCMC to the Federal Building in October and November.¹³² At the end of 1980 there was every indication that this unusually successful project would meet the 1 April 1981 planned acceptance date for the complete system.

The 3 and 6 June 1980 False Missile Incidents

(S-Dec1 Jul 2000) In early June, two more false missile events, dissimilar to the one on 9 November, again received widespread publicity and prompted an even more extensive analysis of the TW/AA system. On 3 June at 0525Z, SAC command post displays showed threat SLBMs. The NORAD Missile Warning Center displays, however, gave no such indications. NORAD notified SAC and the NMCC at 0528Z that all systems were clear. Nevertheless, as a precautionary measure, the SAC senior controller directed bomber and tanker crews to board their aircraft and start engines. The NMCC duty officer convened a missile display conference at 0539Z to evaluate the situation. Since all indications of incoming missiles received at SAC and NMCC command posts had arrived on circuits from NORAD, and because no such indications had been received on lines coming direct from the sensors, all concerned believed the data was invalid. The NMCC convened a threat assessment conference at 0549Z to review the situation with all unified and specified commanders. CINCNORAD confirmed there was no threat and the conference ended 0557Z.¹³³

(S-Dec1 1 Jul 2000) NORAD believed the source of the problem was in the line multiplexor, a NOVA 840 computer.* The fault could not be

*(U) The multiplexor took information coming from the main NCS computer and put it into a form suitable for transmission over a communications line.

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isolated, however, without duplicating the error by running the system again in the same configuration it had been on 3 June. Precautions were taken to insure all command centers were aware of what NORAD planned to do, what the effect might be, and how they were to respond. On 6 June, at 1949Z, the false event was duplicated when SAC, the NMCC, and ANMCC displayed different numbers of threatening missiles. The SAC controller, although he understood a test was in progress, again took the precaution of ordering crews to their aircraft. The NMCC convened a missile display conference at 1951Z. NORAD reported all sensors clear and gave its assessment of no threat.¹³⁴

(S-Decl 1 Jul 2000) Immediately following the second incident, the JCS directed the Mission Essential Backup (MEBU) system, a UNIVAC 1100/42 computer, *assume responsibility from the NORAD Computer System (NCS) for the output of data from the Missile Warning Center to other command centers. The NCS would be returned to normal operation when the JCS was satisfied adequate safeguards has been installed.¹³⁵ Efforts to prevent recurrence of the June events focused on correction of the immediate cause and longer term measures to improve system reliability. The particular cause of the erroneous display data was quickly tracked to a faulty silicon chip in an integrated circuit of the communications multiplexor.** The part was easily and cheaply replaced, but work continued on better means of detecting and correcting errors in the system before they exited the NCMC. With the help of government and industry computer and communications specialists, NORAD installed a computer program in the NCS, a Cyclic Redundancy Check, which examined the validity of messages throughout their preparation and processing to insure data transmitted out accurately reflected data received from the sensors. In addition, a new display was installed in the NORAD command post to show what was being transmitted to other command posts. The format of the missile warning messages was changed to reflect only the status of the system, with the space where missile numbers would normally be shown filled in with zeros instead of left blank. Transmission of a real message, with missile numbers replacing zeros would trigger an audible alarm in the NORAD command post.¹³⁶ These safeguards installed, NORAD requested and received JCS approval to return to normal NCS operations. Operations resumed incrementally between 18 and 24 November.¹³⁷

*(U) The MEBU was a shadow processor to the NCS. It received and processed the same information as the NCS so that in the event of failure of the NCS, critical functions could continue.

** (U) The failure did not occur in the computer, but in a circuit board used to connect the output of the computer to the communications line.

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versions which would enable the Mountain to receive and print launch and impact reports from Site III, process them, and output the warning data to SHAPE. The voice hot line was expected to be ready by late September and the teletype by March 1981.¹⁵⁶ After reviewing the status of these projects, the European Working Group recommended to CINCNORAD that NORAD begin providing warning on 1 November. Convinced, however, that command center personnel required additional training, and believing them already overburdened with North American warning responsibilities, General Hartinger was not ready to expand warning services to Europe. He told his staff to work toward a June 1981 implementation date. He also said warning should go first to EUCOM and then later to SHAPE. In the meantime, the necessary technical preparations were to continue.¹⁵⁷ By the end of 1980, Program Modifications Requests for changes to the NCMC computer system had been included in the software release for July 1981. Five European missile warning officers (one for each missile warning crew) were also in training. On 12 December the first step in providing the necessary communications links was taken with installation of the NCMC/UKRAOC hot line.¹⁵⁸ Target date for installation of the teletype circuit remained March 1981.

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NOTES

CHAPTER II - MISSILE WARNING AND ATTACK ASSESSMENT

1. Hist of CONAD (S-RD), 1968, pp 129-130; Hist of CONAD (S-Revw 1 Jul 99), 1969, p. 191.
2. Ltr (S-Dec1 1 Oct 00), Lt Gen J. V. Hartinger, CINCNORAD, to Sec Def H. Brown, n.s., 3 Oct 80 (Doc 1).
3. Plan (S-Revw 17 Mar 00), "Master Plan for Ballistic Missile Tactical Warning and Attack Assessment (Executive Summary)," Atch 1 to SSS (S-Revw 17 Mar 00), Col L. E. Thomas, Dir of Sp and Msl Wrng Ops, DCS/O. ADC to J-3, same subj, 16 Apr 80 (Doc 2).
4. Ibid.
5. Ibid.
6. Ltr (S-Dec1 1 Oct 00), Gen Hartinger to Sec Def Brown, 1 Jul 80 (Doc 3).
7. Ltr (S-Dec1 1 Apr 00), Gen Hartinger to Sec Def Brown, 1 Apr 80 (Doc 4).
8. Ltr (S-Dec1 24 Apr 86), Dr. H. F. Cooper, Jr., Dep Asst Sec AF for Str & Sp Sys, to Lt Gen J. V. Hartinger, Comdr, ADC, 24 Apr 80 (Doc 5); Ltr (U), Brig Gen W. E. Lindeman, DCS/PI, Pol, Progs and Rqmts, ADC to Dr. Cooper, n.s., 16 Jun 80, with 1 Atch (S-Dec1 Apr 86), "Comments on Dep Asst Sec AF for Str and Sp Sys Ltr, 24 Apr 80." (Doc 6).
9. Talking Paper on BMEWS Modernization (S-Dec1 21 Mar 86), prep by Lt Col Wilkins, XPDW, 25 Mar 80 (Doc 7).
10. Interest Paper on BMEWS TOR Upgrade (U), prep by Capt M. L. Hunter, XPDW, 17 Oct 80 (Doc 8); Interest Paper on BMEWS TOR Upgrade (Site II Activation) (U), prep by Capt Hunter, n.d., circa 29 Oct 80 (Doc 9).
11. Msg (U), ESD/OCT-3 to SAC/SXR, "BMEWS TOR Upgrade CPCI Testing," 221940Z May 80; Msg (U), SAC/SXR to ESD/OCZ, "BMEWS TOR Upgrade," 012030Z Jul 80.
12. Msg (U), ESD/OCT-3 to SAC, "BMEWS TOR Upgrade," 022222Z Sep 80; TOR Upgrade Interest Papers of 17 Oct (Doc 8) and circa 29 Oct 80 (Doc 9).
13. ROE Upgrade Interest Paper, 17 Oct 80 (Doc 8); Msg (U-FOUO), SAC/SX to ADCOM/J-5/7-3, "General Officer Review of BMEWS TOR Upgrade," 272205Z Oct 80.

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14. Memo (U) for J-5, "Two Month Slip in TOR Upgrade Installation," from Col L. L. Sheldon, Dep Dir, Msl & Sp Def, 26 Nov 80 (Doc 10).
15. Hist of ADCOM (S-RD), 1979, pp 82-84 (material used S-Revw 99).
16. Msg (S-Dec1 31 Dec 00), Hq AFSC/AC/SD to Hq USAF/ACB/RDS, "BMEWS Missile Impact Prediction (MIP) Upgrade Program," 291407Z Jan 80.
17. Msg (U), Hq ESD/OC to Hq AFSC/SD, same subj, 111831Z Apr 80.
18. Msg (U), Hq USAF/LEXP to Hq AFSC/SDE/ACB et al., "BMEWS MIP/ Approval to Proceed," 122022Z Jun 80.
19. Msg (U), ADCOM/J-3 to SAC/SX/DO, "BMEWS Computer Operational Concerns," 072300Z Aug 80 (Doc 11).
20. Msg (S-Revw 31 Dec 95), Hq USAF/RDSD to Hq AFSC/SDE, "BMEWS MIP Replacement Program - J-77 Issue," 281830Z Jul 80.
21. DCS/PI, Pol, Progs, and Rqmts Historical Report (S-Revw 31 Dec 98), Tab 3, Jul-Dec 80.
22. Hist of ADCOM (S-Revw 31 Dec 99), 1 Jan 77-31 Dec 78, pp 97-98 (material used S-Dec1 79); Msg (U), ADCOM/J-3F to SAC/SXM, "BMEWS Tracking Radar Outages," 191531Z Mar 80; Msg (U), SAC/SX to Dir Mat Mgt, McClellan AFB/MMC, "BMEWS Support," 172100Z Apr 80. (U) SAC said azimuth drive motors repaired in the past by the Vickers Company had lasted two years, but, more recently, motors repaired by US Dynamics had lasted only four months. (Memo for DO (ADCOM) (U), "Recent History of Maintenance Outages at BMEWS Sites I and II," prep by Col L. E. Thomas, Dir of Sp and Msl Wng, DCS/O, 14 Apr 80 (Doc 12).)
23. Msg (S-Dec1 Upon Termination of Event), 1983CS, Thule AB to SACCA, Offutt, "Commanders Assessment," 302230Z Apr 80; Msg (S-DUTE), 12 MWGp, Thule AB to SCAF et al., "Situation Rpt," 012020Z May 80; Msg (S-DUTE), 1983CS, Thule AB, to SACCA, Offutt, "Commanders Assessment," 011900Z May 80; SSS (S-Dec1 31 Dec 85), Maj Gen B. K. Brown, DCS/O, ADCOM, to A/CV et al., "30 Apr Fire at Thule J-Site," 7 May 80 (Doc 13).
24. Msg (S-Revw 2 May 83), CINCNORAD to NDHQ, Ottawa, "Thule Fire," 022300Z May 80 (Doc 14); Msg (S-Dec1 31 Dec 85), CINCAD to JCS, "Impact of BMEWS Site I Fire," 081400Z May 80 (Doc 15). An analysis of the adverse operational implications of the loss of the Thule tracker is contained in Technical Note (S-Revw 31 Dec 99), "Degradation of TW/AA from Loss of Site I Tracker," prep by T. L. Jones, Jr., Dir of Analysis, ADCOM/XP, 12 Jun 80 (Doc 16).
25. Msg (S-Revw 31 May 00), CINCSAC to CJCS, "Impact of BMEWS Site I Fire," 131640Z May 80 (Doc 17).

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26. Msg (S-Decl 13 May 86), CJCS to CINCSAC (for Gen Ellis, info Gen Allen and Lt Gen Hartinger, from Gen Jones), "Impact of BMEWS Site I Fire," 211719Z May 80; Msg (U), CSAF/CVA to CINCSAC, info CINCAD, "Impact of BMEWS Site I Fire," 051813Z Jun 80.

27. Msg (S-Revw 31 Dec 00), SAC/SX to USAF/XOK et al., "Funding for BMEWS Radome and Radar," 131645Z May 80.

28. Msg (U), USAF/LEXP to SAC/SX, "BMEWS Thule Radome," 142222Z May 80.

29. Msg (U), SACLOG/LGXP to SAC/LGS, "Thule Tracker Status," 312000Z Dec 80; Msg (U), CINCAD/CC to CINCSAC/CC, "Restoral of BMEWS Site I Tracker, 312210Z Dec 80.

30. Msg (U), Dir of Mat Mgt, McClellan AFB/MMC to ADC/DOFW, "Interim Operational Recommendations," 272256Z May 80 (Doc 18).

31. SSS (U) Col L. E. Thomas, Dir Sp & Msl Wrng Ops, ADCOM/J-3 to J-3, "BMEWS Tracker Restrictions," 29 Jul 80 (Doc 19); Msg (U), NORAD/J-3F to 13MWS/DO, "Interim Restrictions for BMEWS Trackers," 021530Z Jun 80 (Doc 20); Msg (C-Revw 31 Dec 85), ADCOM/J-3F, to Dir Mat Mgt, McClellan AFB, "Interim Restrictions for BMEWS Trackers," 242139Z Jun 80 (Doc 21); Msg (U) SAC/SX to Dir Mat Mgt, McClellan AFB, "Analysis of Effects of BMEWS Tracker Power Levels," 272100Z Jun 80 (Doc 22); Msg (U), Dir of Mat Mgt, McClellan AFB to ADCOM/J-3F, "BMEWS Mishap-Related Recommendations," 092355Z Jul 80 (Doc 23); Msg (S-Revw 31 Dec 85), NORAD/J-3F to SAC/SXM, "Effects of Restriction Against Flat Scan," 242018Z Jul 80 (Doc 24); Msg (S-Revw 31 Dec 85), NORAD/J-3F to SAC/DOC, "Interim Restrictions...", 292215Z Aug 80 (Doc 25).

32. Msg (U), SAC/LGS to USAF/XOKS, "BMEWS Radome Replacement," 302123Z Jun 80.

33. Msg (U), SAC/SXM to USAF/XOKS, "BMEWS Radome Replacement...", 141550Z Oct 80.

34. Msg (U), USAF/XOKS to SAC/LGS, "BMEWS Radome Replacement...", 252022Z Jul 80.

35. Msg (U), SAC/SXM to SACLOG/LGXP, "Funding for BMEWS Radomes," 152215Z Oct 80; Msg (U), SACLOG to SAC/SXM, "Funding for BMEWS Radomes," 121515Z Dec 80.

36. Hist ADCOM/ADC (S/RD), 1979, pp 85-89 (material used S-Revw 21 Dec 99).

37. Msg (S-Revw 31 Dec 00), CINCSAC/CV to CSAF/CVA, "Continued Operation of FSS-7 Sites," 042000Z Feb 80 (Doc 26); Msg (U), Hq SACCA/LG to 2161CS/CC, "Continued Operation of FSS-7 Sites," 071924Z Feb 80.

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38. Msg (S-Revw 28 Feb 00), CSAF/CVA to CINCAD/CV, "Continued Operations of the FSS-7 Radars at Fort Fisher AFS and Charleston AFS, ME," 202120Z Feb 80 (Doc 27).
39. Msg (S-Dec1 1 Oct 94), CINCAD/CV to CSAF/CV, "Termination...of FSS-7 Radars...", 270100Z Feb 80 (Doc 28).
40. Ibid.
41. Msg (S-Revw 1 Mar 88), CSAF/CVA to CINCSAC/CV and CINCAD/CV, "Termination of Operations...AN/FSS-7 Radars," 042309Z Mar 80.
42. Msg (S-Dec1 1 Jan 85), CINCSAC/CV to CSAF/CVA, "Otis PAVE PAWS IOC...", 291300Z Mar 80 (Doc 29). (U) The 6MWS reported that as of 21 February it was conducting all operations maintenance and civil engineering activities "as if the site were fully operational." (Msg (U), 6MWS/CC to Hq ADCOM/DOF, "PAVE PAWS Site I Status," 221630Z Feb 80.) The saga of the Otis diesels is told in E. M. Del Papa, Of Missiles and Microwaves: ESD and the PAVE PAWS Radar System (FOUO), History Office, ESD, 1981.
43. Msg (S-Dec1 31 Oct 89), ADCOM/J-3 to NMCC/Surveillance Officer, "Otis PAVE PAWS Operational Readiness," 031830Z Apr 80 (Doc 30); Msg (S-Dec1 1 Jan 85), 6MWS/CC to CINCAD/DOC, "Commander's Situation Report," 040001Z Apr 80 (Doc 31). (U) At least one observer noted the contrast between the lack of fanfare surrounding the event of the radar becoming operational and controversy which arose when construction of the radar was first proposed. Local opposition began to fade when measurements of radiation levels emitted by the radar indicated they were far below those mandated by federal health guidelines. The U.S. Congressman from the area, Representative Gerry Studds, noted public concern had lessened to the extent that at his last two open meetings in the area the subject of the Otis site did not come up. (Robert Cooke, "PAVE PAWS Radar Station Starts Operation on Cape Cod," Boston Globe, 5 Apr 80, p 15.)
44. Msg (U), Hq SCCA/LG2 to Hq AFLC/LOWE, "Phase Down Plan for AN/FSS-7," 082124Z Apr 80; Msg (U), CINCAD/CC to SAC/DO et al., "Charleston and Ft Fisher FSS-7 Performance," 041600Z Apr 80 (Doc 32).
45. SSS (U), Col W. R. Kenty, Asst DCS/OI, Pol Progs and Rqmts, ADCOM to A/DO et al., "Schedule Acceleration of Beale AFB PAVE PAWS," 12 Mar 79; Msg (U), ESD/ACB to AFSC/ACB, "Early Delivery of Site II-- PAVE PAWS," 041600Z Apr 79; Talking Paper (S-Dec1 20 Aug 80), "PAVE PAWS," Maj Nelson/XPD, 20 Aug 79.
46. Msg (U), ESD/ACB to AFSC/ACB, "Early Delivery of Site II--PAVE PAWS," 051600Z Apr 79.

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47. Talking Paper (U), "PAVE PAWS," Maj Nelson /XPD, 5 Aug 79; E. M. Del Papa, Of Missiles and Microwaves: ESD and the PAVE PAWS Radar System (FOUO), History Office, ESD, 1981, pp 51-52.
48. Background Paper on Beale PAVE PAWS (U), Maj Nelson/XPD, 16 Jan 80.
49. E. M. Del Papa, Of Missiles and Microwaves..., p 52.
50. Msg (U), ESD/DEC to Hq SAC/DE, "PAVE PAWS...Power Plant Test," 291430Z Feb 80; Msg (U), Hq AFESC/DEM to ESD/DEC, "PAVE PAWS...Power Plant Test," 041400Z Mar 80; Msg (U), OLK, AFESC/CEMIRT to AFESC/DEM, "Beale PAVE PAWS Power Plant," 052123Z Mar 80; Msg (U), ESD/DEC to AFESC/DE, "PAVE PAWS Power Plant," 202150Z Mar 80; Msg (U), AFESC/DEM to ESD/DEC, "PAVE PAWS Power Plant," 251400Z Mar 80; Msg (U) ESD/DEM to AFESC/DEM, "PAVE PAWS Power Plant," 281640Z Mar 80; Msg (U), AFESC/DEM to ESD/DEC, "PAVE PAWS Power Plant," 312135Z Mar 80.
51. E. M. Del Papa, Of Missiles and Microwaves..., p 52.
52. Msg (U), ADCOM/J3 to SAC, "Dual Operation - Beale PAVE PAWS and West Coast FSS-7 Units." 282345Z Mar 80; Msg (U), SAC/SX to NMCC/Surveillance Officer, "Transmission of Beale PAVE PAWS Data," 232010Z Apr 80; Msg (S-Decl 1 Oct 80), SAC/SXM to Hq USAF/PAX et al., "Dual Operations...", 302140Z Apr 80.
53. Msg (S-Decl 1 Oct 89), SAC/SX to USAF/XOX et al., "Possible Delay of Beale PAVE PAWS Initial Operational Capability," 271630Z May 80.
54. Msg (U), (SAC/SXR to ADC/XPD, "PAVE PAWS False L&I Correction and Verification." 212015Z May 80; Msg (U), 7MWS/DO to SAC/SXR, "PAVE PAWS L&I Correction and Verification," 101440Z Jun 80.
55. E. M. Del Papa, Of Missiles and Microwaves..., p 56-57.
56. SSS (S-Decl 1 Oct 84), Brig Gen B. R. Campbell (CF), Asst DCS/O, NORAD to A/CC et al., "ADCOM Position Concerning Beale IOC," 30 Jun 80 (Doc 33); Ltr (S-Decl 7 Jun 86), Lt Gen J. V. Hartinger, CINCAD to CINCSAC/CV, "Beale PAVE PAWS IOC," 14 Jul 80 (Doc 34).
57. E. M. Del Papa, Of Missiles and Microwaves..., p. 57.
58. Msg (U), NORAD/J-3 to SAC/SX, "PAVE PAWS End-to end Testing with...(NCCM)," 072050Z Aug 80.
59. Msg (U) CINCSAC/CC/CINCAD/CC to CSAF/CV, "Beale PAVE PAWS IOC...", 151400Z Aug 80 (Doc 35); Msg (U), 7MWS/CC to CINCNORAD/J-3J, "Commander's Situation Report," 151901Z Aug 80.

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60. Msg (U), CINCAD to Det 2, et al., "...Performance," 152000Z Aug 80 (Doc 36).
61. Msg (S-Dec 12 Aug 86), JCS/J-3 to ADCOM/J-3P, "PAVE PAWS Detection," 132125Z Aug 80 (Doc 37); Msg (S-Dec 31 Oct 89), ADCOM/J-3P to NMCC/Surveillance Officer, "PAVE PAWS Detection," 282310Z Aug 80 (Doc 38); Background Paper on Beale PAVE PAWS..., (S-Dec 31 Dec 90), Capt M. C. Hunter/XPDW, 17 Oct 80 (Doc 39).
62. E. M. DeI Papa, Of Missiles and Microwaves..., P 58; Msg (S-Revw 29 Oct 00), CINCAD to AIG 951, "CINC's Semiannual Situation Report (SITREP), 1 Apr - 30 Sep 80," 292100Z Oct 80.
63. Msg (S-Revw 20 Sep 00), CINCNORAD to OJCS/J-3, "Tactical Warning System Reliability," 301615Z Sep 80 (Doc 40).
64. Quoted in Msg (S-Revw 20 Sep 2001), NORAD/ADCOM/J-3 to JCS/J-3, "Interim Control for PAVE PAWS Data During 427M Operations," 171530Z Dec 80 (Doc 41).
65. Msg (S-Revw 28 Nov 86), JCS/OJCS to CINCNORAD et al., "Missile Warning Procedures," 231900Z Dec 80 (Doc 42).
66. Msg (S-Dec 2 Jan 87), JCS/J-3 to ADCOM/J-3, "Interim Control for PAVE PAWS...", 062200Z Jan 81 (Doc 43).
67. Hist ADC (S-Revw 1 Dec 98), FY-73, pp 166-167; Hist CONAD/ADC (S-FRD), FY-75, p 76 (material used S).
68. Talking Paper on PAVE PAWS (U), Maj Nelson/XPD, 5 Aug 79; Talking Paper On PAVE PAWS (U), Maj Nelson, XPD, 10 Dec 79; Hist of ADCOM (S-Revw 31 Dec 99), 1 Jan 77-31 Dec 78, p 109 (material used S-Revw 98).
69. Ltr (TS-Revw 5 Oct 98), Hill to Brown, 5 Oct 79 (material used S).
70. Talking Paper on PAVE PAWS (U), Maj Nelson/XPD, 10 Dec 79.
71. Ltrs (S-Dec 1 Apr 00) and (S-Dec 1 Jul 00), Hartinger to Brown, 1 Apr 80 (Doc 4) and 1 Jul 80 (Doc 3).
72. Executive Summary, Master Plan for TW/AA (S-Revw 17 Mar 00), Atch 1 to SSS (S-Revw 17 Mar 00), Col L. E. Thomas, Dir Sp & Msl Wrng Ops, NORAD/J-3 to J-3, 16 Apr 80 (Doc 2).
73. Talking Paper on PAVE PAWS (U), Maj Nelson/XPD, 14 Apr 80 (Doc 44); Atch (S-Dec 1 Apr 86), "Comments on Dep Asst Sec AF Ltr, 24 Apr 80," to Ltr (S-Dec 1 Apr 86), Brig Gen W. E. Lindeman, DCS/PI, Pol, Progs and Rqmts, ADC, to Dr. H. F. Cooper, Dep for Str and Sp Sys, OASAF, 16 Jun 80 (Doc 6).

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74. Ltr (S-Dec1 31 Dec 86), Brig Gen W. E. Lindeman, DCS/P1, Pol, Progs and Rqmts, ADC, to USAF/CVSB, "FY 83-87 POM Submission," 1 Dec 80, with 3 Atchs.

75. NORAD/ADCOM (J-5)/ADC (XP) Staff agency Historical Report (S-Dec1 31 Dec 87), Tab 3, Jul-Dec 80.

76. Background Paper on Justification for Priority of SLBM Warning Assets, FY83-87 POM (S-Dec1 31 Oct 89), Capt Sprague/J-5, NORAD/ADCOM, 16 Dec 80 (Doc 45).

77. Aerospace Defense Command Objectives Plan (S-FRD), 1983-90 (ADCOM 83-90), May 1980, ADCOM/J-5, pp 89-90 (material used S); Msg (S-Revw 31 Dec 86), ADCOM/DOF to SD/YGS, "Stationkeeping Criteria," 242200Z Jan 80; Interest Paper on the Defense Support Program (DSP) (S-Revw 1 Dec 99), prep by Maj N. W. Naccari/J-5DW, 14 Oct 80 (Doc 46); Talking Paper On Sensor Evolutionary Development (SED) (S-Revw 1 Dec 99), prep by Lt Col J. D. Kemp/J-5D, 8 Dec 80 (Doc 47).

78. SSS (S-Revw 1 Dec 98), Brig Gen J. R. Budner, Asst DCS/O, ADCOM to J-5 et al., "Flight 9 Justification Briefing," 22 Jul 80 (Doc 48).

79. Msg (S-Revw 5 Sep 86), USAF/XO to CINCAD/CC, "DSP Launch Approval," 192100Z Sep 80. (S-Revw 1 Dec 98) During a justification briefing for Flight 9 given by ADCOM to the Air Staff in early October, ADCOM was asked what it thought the Soviets knew about the capabilities and vulnerabilities of the system. ADCOM had not evidence regarding the extent of their knowledge, but it thought they had a good understanding of how it worked, its limitations, and vulnerabilities from open literature. This had resulted in part, ADCOM said, from "...a conscious U.S. decision to release information on our general missile detection capability so as to provide additional deterrence to a Soviet first strike." (Msg (S-Revw 1 Dec 98), ADCOM/J-3F to USAF/XOOR, "Knowledge of the DSP System," 101415Z Oct 80 (Doc 49).)

80. Msg (S-Revw 1 Dec 98), CINCAD/CC to Hq USAF/XO0/RDS/PAX et al., "DSP Launch Initiation," 021500Z Oct 80 (Doc 50); SSS (S-Revw 1 Dec 98), Col L. E. Thomas, Dir Sp & Msl Wrng Ops, NORAD to J-3, "Flight 9 Preparations," 2 Jan 81 (Doc 51); SSS (S-Revw 1 Dec 98), Col L. E. Thomas, Dir Sp & Msl Wrng Ops, J-3 to J-5, "Possible Requirement to Reposition Flt 6," 30 Jan 81 (Doc 52); SSS (S-Revw 1 Dec 99) Col G. W. Clark, Dir Msl & Sp Def, ADCOM to J-5, "DSP Launch Decision Meeting -Space Division," 17 Dec 80 (Doc 53).

81. Msg (S-Revw 31 Dec 98), SD/YGD to ADCOM/J-3, Flight Four End-of-Life," 122115Z Jun 80.

82. Msg (S-Revw 1 Dec 98), ADCOM/J-3 to SD/YGD, "Flight Four End-of-Life," 231349Z Jul 80.

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83. SSS (S-Revw 1 Dec 98), Col L. E. Thomas, Dir Sp & Msl Wrng Ops, J-3 to J-3, "Flight Four End-of-Life," 8 Sep 80; Msg (S-Revw 1 Dec 98) SD/YG to AFSCF/VOD, "Support of IRON 6157 (Flight 4)," 141853Z Nov 80.
84. Talking Paper on Large Processing Station Upgrade (LPSU) (S-Revw 1 Dec 99), prep by Lt Col Jay D. Kemp/J-3D, 8 Dec 80 (Doc 54).
85. NORAD/ADCOM (J-3) and ADC (DO), Staff Agency Historical Report, Jan-Jun 80, Atch 2, p 2 (S-Revw 1 Dec 98) (material used U); NORAD/ADCOM (J-3) and ADC (DO) Staff Agency Historical Report, Jul-Dec 80, Atch 6, p 1 (S-Revw 1 Dec 08) (material used U).
86. Hist of ADCOM/ADC, 1979 (S-RD), pp 95-66 (material used S-Revw 1 Dec 99); SSS (S-Revw 1 Dec 98), Brig Gen W. E. Lindeman, DCS/P1, Pol, Progs and Rqmts, ADCOM to A/CC et al., "Simplified Processing Station Status," 16 Apr 80 (Doc 55); Ltr (S-Revw 1 Dec 00), Col L. E. Thomas, Actg Dir Sp & Msl Wrng Ops, ADC/DOF to ADC/XPD, "User Inputs to the DSP PAR," 11 Feb 80 (Doc 56); Ltr (S-Revw 1 Dec 98), Maj Gen H. W. Leaf, Comdr AFT&E Center to Gen Lew Allen, Jr., CSAF, n.s., 31 May 80 (Doc 57).
87. SSS (S-Revw 1 Dec 98), Brig Gen W. E. Lindeman, DCS/P1, Pol, Progs, and Rqmts, ADCOM to A/CC et al., "Simplified Processing Station Status," 16 Apr 80 (Doc 55); Talking Paper on Simplified Processing Station (SPS) (S-Revw 1 Dec 99), prep by Lt Col J. D. Kemp, J-5, ADCOM, 8 Dec 80 (Doc 58).
88. SSS (U), Col L. E. Thomas, Dir Sp & Msl Wrng Ops, J-3 to J-3, "SPS FOT&E Phase II," 5 Feb 80.
89. Hist of ADCOM/ADC, 1979 (S-RD), pp 94-95 (material used S-Dec 31 Dec 99).
90. Booklet (S-Revw 30 Sep 00), "System Operational Concept (SOC) for Mobile Ground Terminals (MGT)," ADC/XPDW, 9 Feb 81, pp 1-1, 1-2.
91. Msg (S-Revw 31 Dec 98), USAF/RDS to SAC/SX, "... (MGT) for the Defense Support Program," 251330Z Mar 80 (Doc 59).
92. SSS (S-Revw 1 Dec 98), Brig Gen W. E. Lindeman, DCS/P1, Pol, Progs and Rqmts, ADC to A/CC, "... (MGT) Procurement Strategy and Request for Proposal," 8 Jan 80, with 1 Atch, Msg (S-Revw 1 Dec 98), ADC/XP to USAF/RD, same subj, 301415Z Jan 80 (Doc 60); Msg (S-Revw 31 Dec 99) ADCOM/J-5 to USAF/RDS/XOK/XOO/XOX/PAX, "... (MGTs) for the Defense Support Program," 062040Z May 80 (Doc 61); Msg (S-Revw 1 Dec 98), SAC/SX to USAF/RDS, "... (MGT) Proposal," 242250Z Jan 80 (Doc 62).
93. Ltr (S-Dec 1 Apr 86), H. F. Cooper, Jr., Dep for Str & Sp Sys, OSAF to Lt Gen J. V. Hartinger, Comdr ADC, 24 Apr 80 (Doc 5).

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94. Ltr (S-Dec 1 Apr 86), Brig Gen W. E. Lindeman, DCS/P1, Pol, Progs and Rqmts, ADC to H. F. Cooper, 16 Jun 80, with 1 Atch, "Comments on Dep Asst Sec AF Ltr, 24 Apr 80" (Doc 6).

95. SSS (S-Revw 1 Dec 08), Col W. R. Kenty, Asst DCS/P1, Pol, Progs and Rqmts, ADC to A/CC et al., "...(MGT) System Operational Concept (SOC)," 6 Jan 81, with 1 Atch (Doc 63).

96. SSS (S-Revw 1 Dec 98), Col W. R. Kenty, Asst DCS/P1, Pol, Progs and Rqmts, ADC to A/CC et al., "New Program Management Directive (PMD) for DSP," 18 Nov 80, with 2 Atch, 1: (S) Background Paper On DSP PMD, and 2. (S) PMD R-S 4047(18)/12431F (Doc 64).

97. Talking Paper on Mobile Ground Terminal (MGT) (S-Revw 1 Dec 99), prep by Lt Col J. D. Kemp, J-5, ADCOM, 8 Dec 80 (Doc 65).

98. Msg (S-Revw 31 Dec 98), USAF/RDS to AFSC/SDS, ADC/XPD, "...(DSP) Ground Station Reliability," 252045Z Apr 80 (Doc 66).

99. Msg (S-Revw Dec 98), AFSC/SDS to USAF/RDS, "...(DSP) Ground Station Reliability," 051515Z May 80 (Doc 67); Msg (S-Revw 1 Dec 90), USAF/RDS to AFSC/SD, "DSP Mission Availability," 042225Z Sep 80 (Doc 68).

100. Ibid.

101. Msg (S-Revw 1 Dec 99), ADC/XP to USAF/RDS, "DSP Mission Availability," 101730Z Sep 80 (Doc 69); Msg (S-Revw 1 Dec 98), SAC/SXR to USAF/RDS, "DSP Mission Availability," 111415Z Sep 80 (Doc 70).

102. Ltr (S-Dec 1 Dec 99), Maj N. W. Naccari, J-5, ADCOM and Capt L. W. Bryant, J-3, ADCOM to J-5/J-3, "Trip Report," n.d., circa 12 Sep 80 (Doc 71); Msg (S-Revw 1 Dec 98), USAF/X00 to ADCOM/J-5, "DSP Mission Availability," 021325Z Oct 80 (Doc 72).

103. Msg (S-Revw 1 Dec 08), ADCOM/J-5 to USAF/X00 (combined ADCOM-SAC Msg), "DSP Mission Availability," 232240Z Oct 80 (Doc 73).

104. Msg (S-Revw 1 Dec 98), USAF/RDS to ADC/DO, "...(DSP) Availability," 231630Z Dec 80 (Doc 74).

105. SSS (S-Revw 1 Dec 98), Col W. R. Kenty, Asst DCS/P1, Pol, Progs and Rqmts, ADCOM to DO et al., "...(SPS) Overseas Siting Site Survey Report," 4 Mar 80 (Doc 75); Msg (S-Revw 1 Dec 08), ADCOM/J-5 to USAF/X00 (combined ADCOM-SAC Msg), "DSP Mission availability," 232240Z Oct 80 (Doc 73); Msg (S-Revw 1 Dec 98), SD/YG to ADCOM/J-5, "Technical Comment to DSP Mission Availability," 041600Z Nov 80 (Doc 76).

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106. Ltr (S-Revw 1 Dec 00), Lt Gen J. V. Hartinger, CINCAD to Dr. G. P. Dinneen, Asst Sec Def C³I, n.s., 28 Mar 80 (Doc 77); SSS (S-Revw 1 Dec 00), Maj Gen B. K. Brown, DCS/O, ADCOM to A/CC, "Response to Dr. Dinneen," 17 Jun 80, with 1 Atch: Ltr (S-Revw 1 Dec 00), Gen Hartinger to Dr Dinneen, 27 Jun 80, with 2 Atch: (1) Analysis, (2) Programs (Doc 78); Msg (S-Revw 1 Dec 98), ADCOM/J-3 to JCS/J-3, "DSP Computer Failure Trends," 052230Z Aug 80 (Doc 79).

107. Msg (S-Dec1 12 Dec 86), JCS/C3S to SAC/SX, "DSP-E Outages," 160032Z Dec 80; Msg (S-Revw 1 Dec 98), SAC/SX to JCS/C3S, "Analysis of DSP-E Outages," 301430Z Dec 80 (Doc 80); SSS (S-Revw 1 Dec 98), Gen Brown, DCS/O, ADCOM to A/CC et al., "DSP Availability Summary for CY 1980," 9 Jan 81 (Doc 81). (S-Revw 1 Dec 08) On 20-21 November both computers at the Woomera station went down because of power problems and as a consequence the Shemya, Alaska, and Diyarbakir, Turkey, radars were switched to an exclusive missile warning role for two days, augmenting BMEWS, PARCS and PAVE PAWS. (Msg (S-Revw 31 Dec 98), CINCAD/CC TO NMCC/DPO, "Termination of DSP-A Support," 220100Z Nov 80 (Doc 82); SSS (S-Revw 1 Dec 08), Col L. E. Thomas, Dir, Sp & Msl Wrng Ops, ADCOM/J-3 to J-3, "Impact on Radars Supporting DSP Augmentation," 4 Dec 80.)

108. SSS (S-Revw 1 Dec 98), Brown to A/CC, 9 Jan 81 (Doc 81).

109. Hist of ADCOM/ADC (S-RD), 1979 pp 89-91 (material used S-Dec1 1 Dec 98); Talking Paper (U) on ...EPARCS, Lt Col B. K. Hufford, XPD, 25 Mar 80 (Doc 83).

110. Msg (U), ESD/OCT to AFSC/SDE, "Termination of EPARCS Contract," 131903Z Jun 80; SSS (S-Revw 31 Dec 99), Brig Gen W. E. Lindeman, DCS/PI, Pol, Progs and Rqmts, ADC to A/CC et al., "Enhanced PARCS," 19 Jun 80 (Doc 84).

111. NORAD/ADCOM (J-5)/ADC (XP) Staff Agency Historical Report, Jul-Dec 80, TAB 3.

112. SSS (S-Dec1 1 Dec 98), Gen B. K. Brown, DCS/O, NORAD/ADCOM, to NCC et al., "PARCS Mission Statement," 10 Dec 80, with 3 Atchs (Doc 85). Gen Hartinger's approval noted on the document.

113. Ltr (U), Col H. R. Witzig, Dir, Cmd & Con (XPC), ADC to Lt Col C. Lang, OUSDRE (SYSS), Def Sys, "P427M Funding History," 3 Dec 79. Funding was calculated as follows:

\$132.6M	ESD Funding (1972-79)
70.5M	ADCOM Funding (1972-79)
\$203.1M	total ESD/ADCOM Funding through 1979.

An April 1977 report on the 427M by an Air Force Independent Review Group (headed by Brig Gen R. T. Herrés) examined the system in detail

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113. (contd) and recommended what had to be done to get it operational. The Government Accounting Office prepared a critical report on the system in 1978 (Report LCD-78-117, "NORAD's Information Processing Improvement Programs--Will it Enhance Mission Capability?" 21 Sep 78.).

114. Atch 1 (U), "Major Events 427M Program," to Ltr (U), Col Witzig, Dir Cmd & Con (XPC), ADC to all DCS's and SSE's, "History of Program 427M," 25 Jun 80, pp 42-69; Msg (S-Revw 6 Sep 99), CINCNORAD to Hq USAF et al., "NCOC Transition to 427M," 102005Z Sep 79; Exerpt, "A Talk with the Sec AF (Dr Hans Mark)," Honolulu Star Bulletin, 7 Jul 60, p 11.

115. Listed here are periodic progress reports on NORAD efforts to comply with IG findings. The basic inspection report is TIG Report Support to NORAD." PN 80-2-56, 3-15 Dec 79, distributed 13 Jan 80 (Doc 163, Hist of ADCOM/ADC, 1979). Updates by ADC on this report through 1980 are contained in: Ltr (U), Maj Gen W. E. Cooper (USA), CS/NORAD, to Hq AFISC/IGF, "Special Inspection of USAF Support to NORAD...", 16 Apr 80, with 1 Atch (S-Revw 1 Mar 99/Privileged Document), "Hq ADC Responses to Hq AFISC Special Inspection..." (Doc 86); Ltr (U), Maj Gen W. C. Moore, VC/ADC to AFISC/CC, "Follow-up of Special Inspection...", 28 Jul 80, with 2 Atchs: (S-Revw 1 Mar 99) (1) "ADC Responses which require further action," (2) "ADC Update to 18 Apr 80 Rpt" (Doc 87); Ltr (U), Gen Moore, VC/ADC to AFISC/AA, "Follow-up to Special Inspection...", 28 Nov 80, with 1 Atch (S-Revw 1 Mar 99/Privileged Document), "Hq ADC Update to Hq AFISC Special Inspection," (Doc 88).

116. Ltr (U), Lt Gen J. V. Hartinger, CINCNORAD to Gen L. Allen, CSAF, USAF, n.s., 14 Mar 80 (Doc 89).

117. Msg (S-Dec1 3 Jan 00), NORAD/DO to all NORAD Region CCs, "NORAD Aircraft Flush Authority," 040005Z Jan 80; Msg (S-Dec1 28 Jan 00), CINCNORAD to all NORAD Region CCs, "Aircraft Flushing Authority," 282355Z Jan 80 (Doc 90); Ltr (S-Revw 23 Nov 99), Lt Gen Hartinger, CINCNORAD to Gen D. Jones, Chairman, JCS, n.s., 28 Jan 80 (Doc 91).

118. Msg (S-Revw 15 May 98), NORAD/DO to AID 7812, "Missile Attack Warning/Interim Emergency Change 1 to N/A Reg 55-19, Vol III, 15 May 79," 171800Z Jan 80; Msg (S-Revw 30 Jan 00), HQ NORAD/J-3 to NCOC/DO et al., "NAS Amber Warning Test," 051520Z Feb 80; Msg (U), Hq NORAD/J-6C to 20NR et al., "NORAD Alert System," 101530Z Mar 80 (Doc 92).

119. Msg (U), NORAD/J-6 to HQ TAC/DC, "NORAD Alert System," 261840Z Jun 80; Msg (S-Revw 1 Jul 00), NORAD/J-3 to AIG 7234, "NORAD Alert System Malfunctions," 281620Z Oct 80; Msg (S-Revw 1 Jan 00), NORAD/J-3 to All NORAD Regions et al., "Revised Procedures in Response to NORAD Alert System Amber or Red Activation," 042200Z Nov 80 (Doc 93).

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120. Ibid.; DCS/O Staff Agency Historical Report (S-Revw Dec 08), 1 Jul-31 Dec 80, 27 Jan 81 (D00 Narrative, p 2).

121. Msg (S-Revw 26 Dec 99), NORAD/J-3 to JCS/J-3/C3S, "Suspension of 427M Development Testing," 261415Z Dec 79 (Doc 178, Hist of ADCOM/ADC, 1979); DCS/O Staff Agency Historical Report (S-Revw 1 Dec 99), 1 Jan-30 Jun 80, Atch 5; DON Narrative (material used (U); Ltr (S-Decl 1 Apr 00), Hartinger to Brown, 1 Apr 80 (Doc 4).

122. Msg (S-Revw 31 Jan 00), JCS/J-3 to CINCNORAD, "NORAD-427M System," 011654Z Feb 80; Ltr (U), F. J. Carr, Commissioner, Automated Data and Telecommunications Services, GSA to Hon W. Graham Clayton, Jr., Dep Sec Def, 19 Feb 80.

123. ESD Acquisition Plan Oct 80-1 (U), "NORAD Validation Center (NOVAC)," 11 Mar 80; Interest Paper (U), "The NORAD Off-Site Test Facility," Col F. D. Richards, NORAD/J-6, 27 Mar 80.

124. Ltr (FOUO), Col W. M. Carruthers, Dep Dir Computer Resources (systems and Resources), Dir Computer Resources, Hq USAF to Hq ADC/KR, "NMC Off-Site Computer Facility Data Projected Directive (DPD) HAF A80-1," 6 Mar 80, with 1 Atch: DPD ADC A80-1 (Doc 94).

125. Ltr (U), Col Richards, ADP Program Single Mgr, Hq ADC to Hq USAF/ADCM, "NORAD Off-Site Test Facility Data Project Plan (DPP) ADC A80-1," 3 Apr 80, with 1 Atch: DPD ADC A80-1 (Doc 95).

126. Memo for Record (U), "Cost for Off-Site Facility Site Preparation Work," Lt Col J. E. Bartos, Ch, ADP Resources Mgt Div, DCS/Comm, Elect, and Computer Resources, 1 Apr 80; Status Report (U), "Status of Off-Site Test Facility Site Preparation as of 7 Apr 1980," n.d., circa 7 Apr 80.

127. ESD Acquisition Plan Oct 80-1 (U), "NORAD Validation Center (NOVAD)," 11 Mar 80; Ltr (U), T. R. Long, Prog Mgr, NORAD Off-Site Test Facility to Hq USAF/ACD/XOK/RDS, "Monthly Status Report-OSTF," 5 May 80 (Doc 96).

128. Ltr (U) T. R. Long, Prog Mgr, NORAD OSTF to Hq USAF/ACD/XOK/RDS, "Monthly Status Report...", 1 Jul 80 (Doc 97).

129. Atch 3, Point Paper (U), n.d., to Ltr (U), T. R. Long, Prog Mgr, NORAD OSTF to Hq USAF/ACD/XOK/RDS, "Monthly Status Report...", 1 Jul 80 (Doc 97); Ltr (U), R. E. Best, Asst Dep for Contracting and Manufacturing, Space Div (AFSC) to T. R. Long, ADCOM/KR, n.s., 22 Aug 80; Ltr (U), T. R. Long, Prog Mgr, NORAD OSTF to Best, Asst Dep for Contracting and Manufacturing, Space Div (AFSC), n.s., 29 Aug 80 (Doc 98).

130. Ltr (U), T. R. Long, Prog Mgr, NORAD OSTF to Hq USAF/ACD/XOK/RDS, "Monthly Progress Report...", 3 Oct 80 (Doc 99).

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131. DCS/Communications, Electronics and Computer Resources Staff Agency Historical Report (U), Jul-Dec 80, p 3; Ltr (U), Brig Gen W. D. Powers, DCS/Comm, Elect, & Computer Resources, (NORAD/J-6) to DCS/Pers (NORAD/J-1), "Manning for NCMC OSTF...", 4 Feb 80; DCS/Pers Staff Agency Historical Report (U), Jan-Jun 80.

132. DCS/Communications, Electronics and Computer Resources Staff Agency Historical Report (U), Jul-Dec 80, p 4.

133. Talking Paper (S-Dec 31 Dec 84), "3/6 June False Indications." Capt V. P. Budura, Jr., J-3, 21 Jul 80, with 1 Atch, "Review of Significant Events," 13 Jun 80 (Doc 100); Ltr (S-Dec 1 Jul 00), Lt Gen Hartinger, CINCNORAD to Hon Harold Brown, Sec Def, n.s., 1 Jul 80 (Doc 3); Msg (S-Revw 31 Dec 89), NORAD/J-3F to Hq STC/GE OPS 2, High Wycombe, UK, "Fake Alarm Indications," 072032Z Aug 80 (Doc 101). An accurate and unclassified account of the events can be found in Report of Sen Gary Hart and Sen Barry Goldwater, "Recent False Alerts from the Nation's Missile Attack Warning System," to the Committee on Armed Services, U.S. Senate, 96 Congress, 2nd session, Oct 9 1980 (Doc 102). The events were also discussed at length by Dr. Dinneen, Asst Sec Def, C³I under questioning by reporters during a DOD new briefing, 17 June. (Msg (U), Sec Def/OASDP to AIG 8798, "DOD News Briefing," 172339Z Jun 80 (Doc 103).)

134. See note above.

135. Msg (S-Dec 6 Jun 86), JCS/J-3 to CINCNORAD, "Communications System Segment," 070121Z Jun 80. the MEBU could perform TW/AA functions normally accomplished by the NCS, but with some significant exceptions. These are listed in Msg (S-Revw 31 Dec 86), NORAD/J-3 to JCS/J-3, "MEBU/NCS Functions," 181845Z Jun 80 (Doc 104).

136. Ltr (S-Dec 1 Jul 00), Lt Gen Hartinger, CINCNORAD to Sec Def Brown, n.s., 1 Jul 80 (Doc 3); Ltr (S-Dec 1 Oct 00), Gen Hartinger, CINCNORAD to Sec Brown, n.s., 3 Oct 80 (Doc 1); Msg (S-Revw 29 Oct 00), CINCAD to AIG 951, "CINC's Semiannual Situation Report, 1 Apr-30 Sep 80," 292100Z Oct 80; Report of Sen Gary Hart (D-CO) and Sen Barry Goldwater (R-AZ), "Recent False Alerts from the Nation's Missile Attack Warning System" to the Committee On Armed Services, U.S. Senate, 96 Congress, 2nd session, Oct 9, 1980, pp 7-8, Appendix A (Doc 102).

137. Msg (S-Revw 15 Sep 86), CINCAD/CC to JCS/C³S, "Resumption of 427M Operations," 151632Z Oct 80 (Doc 105); Msg (S-Revw 15 Sep 86), JCS/ CJCS to CINCNORAD, "Resumption of 427M Operations," 172000Z Nov 80 (Doc 106); Msg (S-Dec 17 Nov 86), Hq NORAD/J-3 to OJCS/J-3, same subject, 180307Z Nov 80 (Doc 107); Msg (S-Revw 15 Sep 86), CINCNORAD to OJCS/J-3, same subject, 052230Z Dec 80 (Doc 108). A status report on the 427M after 60 days of Operation, through January 81 is contained in Briefing (U), "Status of NORAD 427M System...", Atch to Ltr (U), Col Kenty, Asst DCS/P1, Pol, Progs and Rqmts, ADC to A/J-5D et al., 9 Feb 81 (Doc 109).

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138. A review of these studies and reports and NORAD's evaluation of them is contained in Ltr (S-Revw 1 Feb 87), Col Kenty, Asst DCS/PI, Pol, Progs and Rqmts, ADC to J-5A, et al., "Tactical Warning/Attack Assessment Studies and Reports," 5 Feb 81, with 3 Atchs (Doc 110). (U) A JCS "Umbrella Study" prepared between July and December 1980 examined 24 recent comprehensive studies and identified 145 specific and eight general improvements which should be pursued. Significantly, the JCS study group found the majority of findings and recommendations it reviewed were valid and receiving adequate attention and resources. NORAD urged that the recommendations should be prioritized since limited resources would prevent giving all equal attention. NORAD said the System Integration Office would review the recommendations as part of its effort to consider the total TW/AA system. (Memorandum (S-US Personnel Only), LtCol S. R. Newland, Acting Chirman, Study Group, to CINCNORAD, "Tactical Warnings/Attack Assessment, 24 Dec 80, with 1 atch: OJCS Tactical Warning/Attack Assessment Study Group Final Report, Executive Summary); Atchs 2 and 3 to SSS (S-Revw 12 Jan 87), Maj Gen C. A. LaFrance, DCS/PI, Pol, Progs and Rqmts, NORAD to CC, same subject, 12 Jan 89; Msg (U), NORAD/J-5 to OJCS/SC3S, "Tactical Warning/Attack Assessment Study," 192100Z Jan 81 (Doc 111).)

139. Msg (U), Hq USAF/IG to CINCSAC et al., "Review of USAF Organization Supporting Air Force Ballistic Missile TW/AA Systems," 071800Z Jul 80.

140. Report (S-Revw 1 Sep 00 Privileged Document), "Special Management Review...", 3 Jul-2 Sep 80, Vol I, Summary, Atch to Ltr (U), Gen Powers, DCS/Comm, Elect, & Computer Resources, NORAD to CC et al., same subject, 30 Sep 80 (Doc 112).

141. Ltr (U), Gen Lew Allen, Jr., CSAF to ADC/CC et al., "Implementation of Recommendations...", 8 Oct 80 (Doc 113); Ltr (U), Brig Gen Lindeman, DCS/PI, Pol, Progs and Rqmts, ADC to USAF/XO, "Implementation of Recommendations...", 7 Nov 80, with 1 Atch, "ADC Implementation Plan." (Doc 114); Msg (S-Revw 31 Dec 00), Hq USAF/XOOR to Hq ADC/XP, "TW/AA Implementation Plan," 041245Z Dec 80 (Doc 115); Msg (U), Hq ADC/XP to Hq USAF/XOOR, "TW/AA System Review...", 151705Z Dec 80 (Doc 116); Ltr (S-Revw 12 Dec 87), Gen Lindeman, DCS/PI, Pol, Progs and Rqmts, ADCOM to USAF/XO, "Draft...(PMD) for...(TW/AA) System," 12 Dec 80, with 1 Atch "PMD" (Doc 116A).

142. Ltr (U), Col R. L. Binford, Dep Dir, M&O, Hq USAF to ADC/DPQ, "Implementation of Tactical Warning/Attack Assessment Systems Engineer Organization," 24 Oct 80 (Doc 117); Memo for DO, from Col J. E. Strub, Dir, User Interface and Config Control (DOP), "Status of Implementing the Leaf Report," 31 Oct 80 (Doc 118); Msg (U), ADC/CV to SAC/CV, "General Officer Steering Group...", 282306Z Nov 80; Atch (U), "ADC Implementation Plan," p 6, to Ltr (U), Gen Lindeman, DCS/PI, Pol, Progs and Rqmts, ADC to Hq USAF/XO, "Implementation of Recommendations...", 7 Nov 80 (Doc 114); Ltr (U), Gen Lindeman, DCS/PI, Pol, Progs and Rqmts, ADC to Hq USAF/XO, "Draft Program Management Directive...", 12 Dec 80.

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143. ADC SD GC-10, 11 Dec 80.
144. SIO Briefing (U), Atch to Ltr, Col Kenty, Asst DCS/P1, Pol, Progs and Rqmts, ADC to XPA et al., same subject, 26 Feb 81 (Doc 119).
145. Msg (U), Sec Def/OASDPA to Public Affairs/Information, "DOD News Briefing," 172339Z Jun 80 (Doc 103); Howard Silber, "Gen Jones: Computer Error was no Brink-of-War Crisis," Omaha World Herald, 13 Jun 80.
146. Report of Sen Hart and Sen Goldwater, "Recent False Alerts from the Nation's Missile Attack Warning System," to the committee on Armed Services, U.S. Senate, 96th Congress, 2nd Session, p 8 (Doc 102).
147. Glenn Urban, "General says NORAD the 'Best'," Colorado Springs Gazette Telegraph, 27 Jun 80, p-3B; Speech by Gen Hartinger, CINCINORAD, at Air Force Association Symposium, 24 Oct 80.
148. Briefing (C-Revw Dec 99) to Gen J. E. Hill, CINCINORAD, by Capt V. P. Budura, ADCOM/DOPC, "Tactical Warning for Europe," 6 Sep 79 (Doc 120).
149. JCS 2308/794-1 (S-Dec1 24 May 84), "Report by the J-3 to the JCS on Ballistic Missile Attack Warning," 24 May 78; Msg (S-GDS 86), JCS to CINCAD, "Ballistic Missile Warning," 051906Z Jun 78.
150. Msg (S-XGDS-3), ADCOM to JCS, "Ballistic Missile Attack Warning," 111700Z Jul 78; Ltr, (S-Dec1 31 Dec 08), Col R. M. Kronbusch, Dir, Ms1 and Sp Def/XPD to XP, "Trip Report On Visit to USAFE-EUCOM-SHAPE," 27 Oct 78 (Doc 121); SSS (S-Dec1 31 Dec 94), Lt Col M. Waynik, Jr., Ch, Sys Cont Div (DOP) to A/DO, "Missile Warning to NATO," 27 Dec 78 (Doc 122); Msg (S-Dec1 11 Apr 85), Hq USAF/XOX to JCS/J-3 and ADCOM/DO, "Ballistic Missile Attack Warning," 132115Z Apr 79.
151. Msg (U), JCS/J-3 to ADCOM/DO, "Ballistic Missile Warning," 141351Z Jul 78.
152. Briefing, "Tactical Warning for Europe" (Doc 120); Ltr (U), Lt Gen (CF) K. E. Lewis, DCINCINORAD to Vice Admiral Thor Hanson, USN, Dir, Joint Staff/JCS, U.S., 10 Oct 79, with 1 Atch: "Concept of Operations for Provision of Ballistic Missile Attack Warning to Europe," (S-Revw 6 Sep 99), 6 Sep 79 (Doc 123). The reaction of potential European users was favorable. (See Interest Paper on a Concept of Operations for European Warning (U), Action Officer Capt V. P. Budura/DOPC, 3 Oct 79 (Doc 124).)

UNCLASSIFIED

153. Ltr (U), Col J. R. Schafer, Dir, Sys/Config, ADCOM to Col J. Lippicott, Ops Div, SHAPE/SHOC, U.S., 4 Dec 79 (Doc 125); Ltr (C-Dec1 11 Dec 84), BG Campbell, Asst DCS/O, NORAD to Maj Gen J. Ahmann, AC of S/O, EUCOM, n.s., 28 Dec 79, with 1 Atch: "NORAD-SHAPE Memorandum of Agreement for Exchange of Early Warning Information" (S-Dec1 11 Dec 89).

154. Memo for CINCAD et al., (S-Dec1 7 Feb 86), "Concept of Operations for European Warning," (SM-125-80), Col H. D. Neelye, Sec, Joint Staff, 26 Feb 80. JCS had approved 15 February.

155. NORADR 55-10 (S-Dec1 31 Dec 84), "NORAD/SHAPE Memorandum of Agreement for Exchange of Early Warning Information," 30 May 80 (Doc 126); Ltr (C-Revw 28 Jul 84), RADM S. H. Packer, Dir of Ops/J-3, EUCOM to Gen Brown, DCS/O, J-3, NORAD, 28 Jul 80 (Doc 127); Msg (S-Revw 26 Aug 86), NORAD/J-3 to USCINCEUR/ECJ3, personal from Gen Brown to RADM Packer, "NORAD/EUCOM European Warning Efforts," 071830Z Oct 80 (Doc 128); SSS (S-Revw 26 Aug 86), Col Strub, Dir, User Interface and Config Control/J-3P to N/J-3, "European Warning Conference, 9-10 Oct 80," 14 Oct 80, with 1 Atch: Action Items Highlights (S-Revw 26 Aug 86) (Doc 129); SSS (S-Revw 16 Dec 00), Gen Brown, DCS/O, NORAD to N/J-2 et al, "NORAD Briefings to the European Warning Conference, 9-10 Oct 80," 16 Dec 80, with 1 Atch: "European Concept Review and Implementation Status," (Doc 130).

156. Ltr (U), Col Strub, Dir, User Interface/Config Control (J-3P) to J-6S, "European Warning Program Modification Requests," 15 Sep 80 (Doc 131). A good review of European Warning efforts to late 1980 is contained in Talking Paper on European Warning (S-Revw 10 Sep 00), prep by Capt Budura, J-3PC, 10 Sep 80 (Doc 132).

157. SSS (C-Dec1 31 Dec 84), Col Strub, Dir, User Interface/Config Control/J-3P to all Members of European Working Group, "Minutes of Special...Meeting, 14 Jul 80," 28 Jul 80 (Doc 133). After the 3 and 6 June incidents General Hartinger intensified training for Missile Warning Center crews. He also instituted a visitation program to acquaint them more fully with their counterparts and the operational environment at other Command Centers, and officers at those Centers came to the NCMC for like indoctrination.

158. Talking Paper On European Warning (S-Revw 10 Sep 80), prep by Capt Budura, J-3PC, 10 Sep 80 (Doc 132); SSS (S-Revw 26 Aug 86), Col Strub, Chairman, European Warning Working Group to N/J-3, "European Warning," 9 Dec 80; Msg (U), NORAD/J-3 to Hq Strike Command (STC) (RAF), "NCMC/ UKRAOC Hot Line," 302030Z Dec 80 (Doc 134); Msg (S-Revw Dec 99), NORAD/J3P to Hq Strike Command (RAF), "European Warning Voice-Tell Procedures," 181903Z Dec 80 (Doc 135).

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