# AN ACE IN THE HOLE

*-a study of Alaska's Railmobile Command Post*

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## PREFACE

This study was undertaken at the request of the Commander, 11th Operations Group to review the history of the ACE/ALCOP train and provide HQ PACAF DCS/Logistics with a complete history of the rail mobile command post. This study attempts to answer questions concerning the origin, mission requirements, operations, command taskings and acquisition of replacement railcars for the current ACE/ALCOP. The information used was taken from histories on file in the Consolidated History Office at Elmendorf AFB and is listed in the Biblography. The final paragraph is my analysis of the decisions that must be made as to future of the ACE/ALCOP. My thanks to Capt Robert Johns, 11OG Chief, Contingency Operations and MSgt Greg Hall, NCOIC of the ACE/ALCOP, for their assistance on this project. I hope at some time in the future this study will be expanded to include pictures, charts, and maps to further clarify the history of the ACE/ALCOP.

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**REQUIREMENT FOR AN ALCOP**

Prior to 1959, Tok Junction was the Alaskan Air Command (AAC) and the Alaskan Command (ALCOM) emergency relocation site (ERS) and alternate command post (ALCOP). On 15 June 1959, Lieutenant General F.A. Armstrong, Commander-in-Chief, Alaska (CINCAL), expressed a desire that Wildwood AFS, a communications site, be used as an ALCOP for AAC and ALCOM. The ERS/ALCOP was relocated there on 25 October 1959.

Murphy Dome AFS became the AAC ALCOP in 1964 and was manned and operated on a 24-hour basis, while Wildwood AFS was retained as an ERS command post and was manned on a standby basis by Det 1, 5008 Support Squadron until Wildwood's inactivation in 1974. During exercise Emerald Pingo 81-1 in November 1980, a requirement for a more suitable alternate headquarters or command post for AAC was identified. The requirement was partially driven by the planned conversion of Murphy Dome to a Joint Surveillance Site in April 1983. By that time most of the communications and all of the battle management capabilities would be withdrawn.

With a newly published Air Force Regulation 55-105, Developing a Continuity of Operations Plan, each major command prepared a plan which designated an alternate headquarters. Headquarters AAC also prepared a line of succession of alternate headquarters for the Joint Task Force-Alaska (JTF-AK) staff. As a result, the Chief of the Plans Division, Colonel Royce U. Jorgenson, conducted a study to determine the feasibility of establishing an alternate. He looked at three solutions: (1) the use of Site Bay, an abandoned US Army Nike missile site located on Goose Bay across the Cook Inlet from Elmendorf; (2) using a theater-assigned C-130 capable of being configured with the required communications; (3) and succession of command.

Succession of command appeared more feasible as a short term solution due to the costs associated with the first two. Under the succession of command concept, the commander JTF-AK would be succeeded by the commander, Army

Forces (COMARFOR), commander Air Force Forces (COMAFFOR), and then a senior colonel.

A second, more detailed study was conducted during February 1981 to determine the feasibility of using Site Bay as an alternate command post. The AAC had requested the 172nd Infantry Brigade retain the former air defense artillery site due to its several advantages. It contained a headquarters building with billets and messing facilities, several munitions bunkers, and two missile launching bunkers which were hardened and earth protected. The site also had a 5,000 foot lighted gravel runway.

Most of the facilities were on federally owned land. However, the missile bunkers, which were suitable for locating the command post, were on state owned land that was leased to the Army. The estimated cost for a three-year lease was $395,000 with an added $11,000 required to restore the facilities to a livable condition. The study did not figure in the costs for conversion of the bunkers to a command post.

When AAC staffed the Site Bay proposal, opposition to the idea was unanimous. Costs and survivability being the main reasons the staff felt the idea was not feasible. After further adjustments to the study, it was submitted to Lieutenant General Winfield W. Scott Jr., AAC Commander, on 6 March 1981 with four options listed. They were:

--Maintain the existing line of succession.

--Designated an existing headquarters, 21 Tactical Fighter Wing or 343 Composite Wing or cross service channels and use the 172 Infantry Brigade.

--Request a waiver to AFR 55-105 and dismiss the desire for an alternate headquarters.

--Request a waiver to AFR 55-105 and pursue development of an alternate headquarters not located with an existing military headquarters.

In a note penned to the bottom of the study, Colonel Jorgensen expressed his personal belief that the succession of command was the best solution given the existing threat. He was against an alternate headquarters, and recommended the idea of using Site Bay be dropped. General Scott agreed.

**NEW COMMANDER, NEW IDEA**

Though it seemed settled, the issue of an alternate command post was raised again by the new AAC Commander Lt Gen Lynwood E. Clark. After he visited Site Bay and considered several other options, he decided to explore the possibility of using railroad cars as a mobile alternate headquarters. He tasked Colonel Jorgensen to study the possibility.

On 23 October 1981, Colonel Jorgensen solicited comments from the staff. The proposed concept called for using railroad cars equipped with the necessary facilities and communications as a mobile command post for the JTF-AK and AFFOR staffs. The cars would be maintained in an operationally ready condition on Elmendorf AFB for immediate deployment to any location on the rail belt, including Eielson AFB or Fort Wainwright. The cars could move to a preselected location with a full staff compliment to handle all operations, or with a limited crew to monitor operations.

The new concept would give General Clark and his staff the capability of handling reconstitution of forces and redirection of efforts following a nuclear attack and the destruction of Elmendorf AFB. It would also complement, but not replace, the E-3A Sentry, the Northwest Region Operations Control Center (ROCC) and the succession of command.

Overall, the staff was in favor of the concept of a mobile command post although the Director of Communications, Colonel Robert H. Ludwig, was concerned about the availability of communications. He pointed out the need for funding to obtain the necessary additional equipment while several other staffs suggested alternatives to the railroad concept such as highway vans or boats.

The Deputy Commander for Logistics, Colonel Carl A. Mansperger provided a detailed point paper outlining the availability of railway cars. There were two locomotives and one flatbed car in AAC's inventory at Eielson AFB and the Strategic Air Command owned a locomotive at Clear AFS. There were no railroad cars available for purchase in Alaska. However, AMTRAK had surplus rolling stock that could be bought at a reasonable price ranging from $10,000 to $20,000 per car depending on the type.

After the staff generally agreed, Colonel Jorgensen turned to having the "Mobile Emergency Command Post" included in the FY 84-88 POM. On 4 November 1981 he staffed a proposal requiring six railroad cars that included a JTF/AFFOR/AAC operations car, sleeping/dining car, communications, power, supply and fuel tank cars. Further, approximately 61 personnel would be needed to man the facility at an estimated cost of $4.6 million in FY 84. The staff again reviewed this new proposal and recommend a few changes.

The number of cars to be purchased was reduced to two, operations and communications/power. The remaining railcars would be leased, borrowed, or purchased as the situation dictated. However, the cost had increased to an estimated $29.8 million, of which communications accounted for $22 million. General Clark approved the requirement and it was placed in the FY84-88 POM.

With General Clark's approval, the mobile emergency command post became an operational requirement because it provided mobility, flexibility and capability for future expansion. The railcars were also cost effective over maintaining fixed ground-based locations. On 3 December 1981, Colonel Don Conway, Vice Commander, AAC, assigned the project responsibility to the DCS Operations. Since the project would not be funded prior to FY 84, General Clark decided to proceed with an interim mobile command post using existing funding.[1]

[1]Eventually, the request was not approved by Congress for specific appropriation of funds.

Wing Commander R.J. Rogers, and RAF Exchange Officer, was designated chairman of a committee composed of representative from the HQ AAC staff. They were charged with implementing the interim mobile emergency command post. The committee met three times in 1981 to investigate ways for obtaining the railway cars and communications equipment.

**FINDING THE CARS**

In June 1981, Lt Col John P. Rhude, Director Ground Environment, DCS Operations, assumed responsibilities for the ALCOP and insured the implementation progressed smoothly--although several suggestions from General Clark found their way into the process.

Initially, General Clark and his staff hoped to obtain surplus cars from AMTRAK at a reasonable price. However, in early January 1982, Mr. Frank Jones, General Manager of the Alaska Railroad (ARR), offered to provide cars free of charge from surplus stocks. He also agreed to allow AAC free access to the Alaska Railroad's track system and provide, at cost, locomotive service to pull the cars. General Clark took up Mr. Jones' offer.

By May 1982 four of the five cars needed were delivered from ARR to Elmendorf AFB, the fifth arriving later in the year. Teams from the 21 Civil Engineering Squadron and 1931 Communications Group (AFCC) together with maintenance personnel from ARR began converting the cars into the ALCOP immediately. Military personnel renovated the electrical, heating and ventilation systems; designed, built and installed the communications consoles and equipment. Alaska Railroad personnel rebuilt the undercarriages of the cars to bring them up to federal standards.

In early October 1982 the renovation teams had converted all five of the needed cars. The first of two 80-foot passenger cars was converted into a command and control center equipped with radio and telecommunications equipment, microcomputers, and stations for the battle commander, operations staff, and support

personnel. The second passenger car was refurbished with 14 bunks for sleeping, a kitchen and dining area, bath facilities and a place for crew rest.

Storage tanks for fresh and waste water were installed in an insulated box car. The utility car sent to the command housed electric generators and fuel for heating, lighting, and power production. The last car was a tank car which carried fuel for long term deployments.

Communications equipment for the train was obtained from existing commercial resources. The equipment consisted of HF radios that provided voice and secure teletype communications, multichannel UHF transceivers, 100 and 60 word per minute teletype transceivers, and seven push-button telephones.

The communications system provided access to both commercial and AUTOVON subscribers. The ALCOP Commander and his staff had the capability to talk with the National Command Authority as well as other command and control facilities.

The total cost for acquiring and installing communications equipment and converting the cars was approximately $303,000. That sum included $160,000 for supplies and equipment--including communications equipment. An additional $128,000 was spent on Air Force civilian wages and $15,000 in refurbishment costs.

**THE FIRST DEPLOYMENT**

Although a concept of operations for deployment of the ALCOP was still under development and work on conversion was still in progress, the ALCOP's first deployment was during JTF-AK command post exercise Emerald Pingo 83-1 in October 1982. Depending on the role the ALCOP was deployed, JTF-AK, COMAFFOR or both, it was normally manned with 20 personnel although some planning figures were as high as 61 personnel. The staff consisted of a battle commander, two air operations officers, two Army ground liaison officers, one airlift liaison officer, two intelligence officers, two logistics officers, two status technicians, one power technician, one communications officer, three communications operators, and three communications maintenance technicians.

The ALCOP was deployed overnight to Talkeetna, AK to checkout the communications systems and evaluate operations. The only significant problems encountered were the failure of the battle staff computers placed aboard the train to function properly. The slow rate of 100 words per minute in transmitting hard copy communications was unsatisfactory.

As a concept of operations was worked out towards the end of 1982, AAC operations staff selected several locations the ALCOP could deploy throughout Alaska. The criteria for these locations allowed the ALCOP to tie into existing commercial communications systems and use its own as well. The initial locations used by the ALCOP were Seward, Moose Pass, Whittier, Wasilla, Willow, Talkeetna, Cantwell, Denali Park Summit, Healy and Nenana.

At one point in early 1983, consideration for stationing the ALCOP at Eielson AFB was suggested. A staff study determined that it was much more feasible to station the ALCOP at Elmendorf because of manning, storage, deployment and support considerations. Primarily, most of the operators and communications maintenance personnel were stationed at Elmendorf.

**ALCOP OPERATIONS AND UPGRADES**

On 14 January 1983, General Clark, accompanied by ARR General Manager Frank Jones, officially dedicated the AAC/JTF-AK ALCOP. The dedication culminated over two years of planning effort and work to convert the 1945-vintage surplus railroad cars into a mobile command post.

The ALCOP deployed again during exercises Brim Frost 83, 28 January to 2 February 1983, and Emerald Pingo 84-1, 7 to 10 November 1983. The deployments were used to train and familiarize the ALCOP crew with their duties and to activate and check out equipment. Both deployments were made to Talkeetna. Although actually deploying the ALCOP was highly successful, communications still remained a problem by failure to link up with the Tactical Air Control Center (TACC) at Elmendorf and its computer based Information Management System (IMS).

The operators on board experienced difficulties establishing reliable links with other command centers. The radios installed on the train were civilian "HAM" radios modified to military specifications. The radios were user intensive requiring precise manual dialing and were not supportable through the military supply system. Transmission times for record communications was slow and procedural problems such as who was responsible for signing for crypto equipment occurred. Despite these recurring problems, the deployments did validate the concept of using the ALCOP as an alternate headquarters in the event of an emergency.

Work continued on resolving the communications problems and ideas such satellite and meteor burst communications systems hookups were explored throughout the years 1983 to 1989. In September 1983, General Clark informed the ALCOP staff that the train would also house the ANR Alternate Command Element. Since then the train was officially known as the ACE/ALCOP.

**The 11th Air Control Wing Takes Control.** Because of a need to provide full time management of the ACE/ALCOP, logistical and maintenance functions were turned over to the 11th Air Control Wing (then Tactical Control Group) on 15 April 1986 and full responsibility for ACE/ALCOP operations on 1 September 1986. Manning was provided by AAC, JTF-AK, 1931st Communications Wing (CW), 21st Combat Support Group, the 6th Infantry Division, and the 11 ACW.

**Curing the Ills.** The ACE/ALCOP, as originally envisioned, would have the capability to communicate rapidly with almost any base or defense system or other command and control agency in either Alaska or the Continental United States while operating at various locations between Seward and Fairbanks. In fact, the ACE/ALCOP had not reached this capacity by 1987 for various reasons. Much of this had to do with the fact that the original communications equipment installed in the train was a trade off between what was available at the time involving space limitations, manpower and monetary considerations and the existing technology of the early 1980s.

A series of communication equipment upgrades to the ACE/ALCOP had been planned for years. In 1987 new Zenith Z150 "Tempest" computers, with modems for transmitting and receiving information, were installed in lieu of teletypes. New secure telephone units (STU-IIIs) that would provide secure voice capability were to be installed. The new PACER BOUNCE High Frequency (HF) radio systems with digital synthesized tuners would greatly reduce the need for highly proficient radio operators. While these improvements would significantly improve the ACE/ALCOP's communications abilities, long standing difficulties with the IMS remote link between ACE/ALCOP and the Region Operations Control Center (ROCC) at Elmendorf continued. In fact connectivity was never established but the planned Alaskan Command and Control Military Automated Network (AC2SMAN) tie-in would replace the IMS altogether.

The AC2SMAN (pronounced AX-MAN) system was expected to be operational in the fall of 1989. Until that time the poor performance of the IMS communication link between the train and the ROCC was accepted since the system did function internally in the ACE/ALCOP and a solution to the problem was at last on the horizon.

**Reaching the Outside World.** A ready solution for problems involving the ACE/ALCOP's HF connectivity to the ROCC, E-3 and other C2 components was more elusive. The ability to talk to NORAD was established as the primary means of communication in the ACE/ALCOPs operations plans, but, there was no corporate memory of this ever done at any time in the past. Outside Alaska, connectivity was supposed to be established with the NORAD Rapid Emergency Reconstitution Team (RAPIER) and the Defense Communication System (DCS) HF entry stations at McClellan and Hickam Air Force Base in California and Hawaii. The HF network aboard the train was designed to be used for both inter and intra Alaska communication. Still, the ACE/ALCOP was unable to achieve HF connectivity with RAPIER even after PACER BOUNCE radio equipment was installed prior to exercise "Apollo Griffin" in March 1988.

What sometimes worked within Alaska, was connectivity to the ROCC and E-3 established through the Alaska MARS network or other authorized military or civilian organizations having an HF transceivers. In fact though, in a number of cases the ACE/ALCOP was lucky to be able to talk across Elmendorf.

The problems surrounding HF connectivity had long been blamed on the poor propagation environment and magnetic interference inherent in the far northern latitudes. This only served to impede progress in attempts to address the problem. Over time, 11 ACW officials came to believe the major difficulty in HF communications was the train's antenna system. At times exercise personnel were able to hear participants in CONUS communicating with RAPIER, a sign that the northern environment was not really the major problem.

Captain Robert Schmidt, Chief of the wing's Communication Systems Management Branch felt strongly that the entire HF antenna system would have to be replaced before acceptable connectivity could be achieved. The types of antennas originally installed on the train were of the "Ham Radio" variety with mobile whips and loading coils plus two 30 foot military whips. These antenna could not accept the full power output from the train's existing and planned amplifier and radio equipment. Much transmitter power for most of the frequencies was being wasted as excess heat in the coaxial cable transmission lines. Additionally, the antenna were fixed and tuned to a specific frequency resulting in very narrow band width and poor radiating efficiency.

A related concern was that the AN/GRA-4 antenna hoist support kits for the train took a large amount of time to erect and were difficult to put up during cold weather or in deep snow. With the ACE/ALCOP's continuing failure to achieve acceptable HF transmissions during exercises, it was becoming increasingly obvious that the only way to accomplish acceptable connectivity was to upgrade the train's entire HF antenna system.

Formal proposals by the wing to upgrade the ACE/ALCOP's antenna system had been made to the 1931 CW and AAC in early 1988. Plans called for using

military specified (MILSPEC) and commercially procured equipment that had already been field tested, proven successful and was in use at other Air Force and DOD locations. Several possible alternatives existed in the types of broad band antenna required, including rotatable self supporting steel antenna towers. The equipment was readily available through the Electronic Security Division (ESD). Additional equipment that would establish an Alaskan "adaptive" HF system for the ACE/ALCOP included: Zenith microcomputers and peripherals (already installed), the PACER BOUNCE radio upgrade and linear power amplifiers. The new equipment would enhance all phases of HF connectivity. While deficiencies in the antenna system had been pointed out to both AAC and the 1931 CW, previous responses suggested a lack of interest or urgency concerning the problem.

At a July 1988 ad hoc ACE/ALCOP Working Group meeting, the most important issue discussed concerned the need for a single, integrated installation upgrade plan for the train involving a new HF antenna system, PACER BOUNCE upgrades, the AC2SMAN tie-in, new digital telephone switches (STU-III) and other C2 enhancements. The Working Group recommended that AAC officials at the highest level be briefed on the upgrade projects and their importance to a functioning ACE/ALCOP along with costs in terms of material and man-hours.

The group felt that if enough interest and support for the projects could be generated at all levels, the ACE/ALCOP could be deployed in a much more active support role during the upcoming "Brim Frost 89" exercise slated for January. Success in deploying the train depended on a detailed C2 installation plan being worked out and all necessary materials ordered by 1 September 1988.

At a joint AAC and 11 TCW Program Management Review conference in October 1988, AAC declined to brief the status of C2 upgrades for the ACE/ALCOP because..."the 11th was OPR for all upgrades for the train." At that time only two communications upgrade projects had active AFCC approval; PACER BOUNCE radios and the replacement of teletypewriters with TEMPEST computers. The two

projects were monitored by the 21 TFW communications plans section but were still in the AFCC arena where they should have been tracked by AAC as well.

As exercise BRIM FROST 89 approached, no gains in the HF antenna upgrade issue had been made. The position of AFCC was that the "train was not a validated system" and they received no manpower credit for work on it. The 1931 CW's support for the ACE/ALCOP had, at times, seemed one of indifference. Communications Squadron personnel had used parts and various equipment on the train as an open stock area to borrow from for use in other areas or agencies experiencing equipment problems or shortages.

After more than six months AFCC had failed to act on a study completed by Captain Schmidt detailing ways to improve the HF system aboard the train. Previously, the project support agreement for PACER BOUNCE had lain dormant for almost a year before approval. The bottom line seemed to be the 11 ACW was not being support by the "single manager for all communications systems in the command." Without that support, AAC in turn lacked the impetuous to prioritized ACE/ALCOP communications upgrades.

In mid October 1988 an adaptive HF system was installed at HQ NORAD/RAPIER and Air Force Space Command (AFSPACOM) at Peterson AFB, Colorado by Msgt Russ Russi of the 11 TCW and John Slocum from AAC. Messages were successfully sent and received between RAPIER and the Elmendorf MARS station on 9 November. This was the first HF communication between Alaska and RAPIER, demonstrating the capability of adaptive HF.

**BRIM FROST 89.** The ACE/ALCOP did not deploy to an off base location during BRIM FROST 89. Never-the-less, the extreme record cold that gripped Alaska during the exercise period introduced ACE/ALCOP personnel to operating problems which were thought to have been provided for.

In the minus 30 degree temperatures, many of the train's electrical strip heaters burned out, necessitating emergency re-supply. Heaters mounted in the ceiling ran continuously exposing the upper levels of the sleeping cars and other

areas to a layer of extreme heat near the ceiling while floor areas remained very cold.

Another temperature related problem involved freezing sewer lines aboard the train. While the sump under the train was protected with insulation and heat tape, it was not able to withstand the arctic temperatures. A wooden framework was nailed around the base of the train with sheets of heavy plastic attached and ground heaters placed under the train to heat the lines and sump pump. While this solved the problem in garrison, it illustrated the fact that since the train did not own this equipment, actual deployment to the interior of Alaska in arctic conditions would result in more problems.

While some areas of the train froze, the communications car still required air conditioning. This was the result of the remaining old tube type communications equipment on board that generated excessive heat. Despite the conditions, major advances for the ACE/ALCOP took place during BRIM FROST 89.

For the exercise, five seperate computer terminals were installed aboard the train with a data link established to AC2SMAN. Connectivity to the Main terminal was made via telephone and a microcomputer which linked the terminals to the central AC2SMAN data base. This allowed the ACE/ALCOP to have a fully automated, real time picture of the tactical air status and force structure.

The train's "microvax" computer could deploy with a complete data base. Continually updated, it could survive an enemy attack on the central command and control facility. A survivable data base would enable the commander to know which theater assets were available at a given time and who to contact in reconstitution of forces. The system was also important for an "archival" purpose for long term reconstitution efforts. The data base contained detailed information right down to the tail number of aircraft, including what parts had been ordered for it. This enabled the commander to know exactly what was available in the theater.

Because the AC2SMAN was built up through a series of sub-systems, it was extremely detailed and of great value in long term reconstitution efforts. While the

hardware and terminal connections for the train were accomplished during BRIM FROST, software upgrades to insure continual update of the data base were expected to be completed by September 1989.

**The HF Problem Solved.** In April 1989, the ACE/ALCOP finally received new Harris HF radios under the PACER BOUNCE upgrade program. The new system had the capability to pre-program all frequencies or a pre-arranged family of frequencies electronically, instead of manually tuning by hand. This allowed much faster and more reliable transceiver capabilities. The new radios also allowed secure HF communication with the E-3 AWACS. A side benefit was the elimination of off-line encryption of a good portion of the message traffic between the ACE/ALCOP and the ROCC. The train now had the capability to monitor conversations between the ROCC and the E-3 in a secure monitor mode, eliminating extra paths of communication in order to keep the ACE/ALCOP updated on E-3 activities. Major Thomas A. Raffetto, Chief of the wing's Operations/Plans Branch explained that the new radios now enabled the train to..."get all the data in real time without anyone having to repeat it twice."

Now that the ACE/ALCOP had the inter-Alaska communication problem solved, the HF connectivity the NORADs RAPIER was next on the agenda. With the arrival of the Harris radios, Capt Schmidt conceived the idea of using a sloping wire antenna. With the antenna installed, contact with RAPIER was finally achieved. While some propagation problems still existed it was now a matter of natural phenomena inherent in a far north environment and not limited by outmoded equipment.

During testing and operation of the Harris HF and a sloping wire antenna it was discovered that the hours during the period of sunrise between Colorado and Alaska was the most difficult time to obtain connectivity. After the sun was fully up and the right frequency was selected, the ACE/ALCOP was usually able to achieve and hold connectivity until the sunrise events started again.

The slopping wire was a vast improvement over the original antenna system on the train. The old three-sided antenna mast, about sixty feet in length, was carried aboard the train and assembled at the deployed location. This proved very difficult to erect in deep snow and frozen ground which also limited the antenna's directional abilities.

The sloping wire utilized a post and winch arrangement carried on the side of the train that elevated a mast up to 30 feet. The antenna itself consisted of copper wire that was strung from the mast to another formation that could act as a support, usually a tree. The wire was stretched out in the needed direction and distance.

**Other Improvements in 1989.** With the addition of the new systems, other functions changed aboard the ACE/ALCOP. Reporting functions involving Situation Reports, Assumption of Command reports, etc., went from manual to automated procedures. The microcomputers accomplished these functions electronically by word processing software which enabled messages to be printed out and transmitted by a keyboard operator. This significantly reduced the time for message formulation.

Eventually, the interface between the microcomputer, encryption device and HF radio modem went direct with no need for a keyboard or teletype operator. These new machines and procedures helped draw down the manpower assigned to the ACE/ALCOP. From the original 20 personnel, the size of the crew had grown to over 40 personnel by 1988.

Another improvement to radio communication was the installation of an HF "Packet" radio device for the weather position. With the Packet device the weather officer could receive world-wide military weather data and synoptic maps just like what would be available in a base weather station. The term "Packet" referred to a switching device which allowed small bursts of radio data to be transmitted during short periods. The packet stored the information until the complete message was received then produced a product.

**New Generators.** In June 1989, two 100 kilowatt (KW) Detroit Diesel generators were replaced with two 60 KW generators. The new generators required less than 75 percent of the available space needed by the larger generators. From a logistical standpoint this resulted in more storage space and greater sustainability. Since the train only drew a 30 KW load the new generators had plenty of reserve capacity power and were capable of operating over a 30 day interval with the existing fuel supply.

**The Rail Mobile Battle Academy (RMBA) Program.** The RMBA program began in April 1989 and consisted of formal training and instruction in specialized areas for ACE/ALCOP augmentee personnel. Essentially a school, the RMBA was started in response to the realization that as the train was generated in more exercises there were unique circumstances involved in how to function and live in a mobile environment with the close confines. The RMBA curriculum was tailored to instruct Battle Staff personnel how to work, live and conduct efficient operations in the limited space. Training classes were conducted in the areas of small arms qualification, woodland survival, Alaska geography, ACE/ALCOP operations concepts, etc.

Lt Col Walter Green, director of the wing's Plans and Programs Branch, initiated the structured training concept for augmentees when the need for it became apparent during BRIM FROST 89 operations. Major Thomas Raffetto of the branch explained:

> We make an effort through the training to integrate everyone's operations so that the timing of when and how people do things make sense. We know what every position is supposed to do and have it ordered in a logical way so that people are orchestrated to carry out their respective jobs in an efficient manner and not get in each others way.

**Assessment of Capabilities Study.** During NORADs exercise Amalgam Chief 89-2 held in May, a formal assessment of the ACE/ALCOPs capabilities was conducted under contract by the Technical Studies and Analyses Corporation of Colorado Springs. The study included analysis of communications connectivity

effectiveness; information flow capabilities and requirements; time critical message handling; AC2SMAN effectiveness; and status of operations. *The document is highly detailed with findings, conclusions and recommendations for future operations. It is located in the 11 ACW History Office and available to those with proper security clearance and need to know.*

**Age Becomes a Factor.** While the ACE/ALCOP continued to receive upgrades and improvements during 1990, a concern that impacted future operations involved the age of the railcars themselves. In the winter of 1990, an ARR inspection of the train revealed deterioration caused by a combination of the advanced age of the cars and outside storage necessitated replacement action. The cars were beginning to rust, brakes were in need of repair, floors were rotting and various other maintenance actions were needed, provided parts could be found.

An agreement between the wing and the 21 TFW allowed the ACE/ALCOP to be stored and operated from inside building 21-884 as a long term heated indoor storage and depot operation area. The train bay in the building had once been used for unloading base supplies from railroad boxcars--a practice long discontinued. However, modifications to the building were required to support the ACE/ALCOP and the indoor operation of its equipment.

The project included: ventilation systems for the train's electrical power generators, ground electrical power supply, installation of HF and SATCOM antenna systems, and physical security system enhancement. The facility not only served as a protected storage area when the train was not deployed but also allowed it to operate "in garrison" if necessary, without actually leaving the building.

The building modification costs were estimated to be $83,000 and work was scheduled to begin in April 1991. However, it remained unfunded until August when Headquarters, Pacific Air Forces (PACAF) provided $87,000 for the project.

**Almost destroyed by fire.** On 30 January 1991, just prior to the ACE/ALCOP deployment for Arctic Warrior, Sgt Timothy Zorn and SrA Kenneth Acton of the 21st Security Police Squadron were returning from security checks as

part of the Arctic Warrior exercise. As they were driving past the ACE/ALCOP, parked outside, a light flickering under the train caught their eye. Not sure what it was, they stopped to investigate. Finding a fire beginning on some insulation, Sgt Zorn grabbed his patrol car's fire extinguisher and put the fire out while SrA Acton called the situation in.

After fire department personnel arrived on scene and took over the situation they found only slight damage. A six by six inch section of insulation was charred. The investigating fire chief, MSgt Michael Lowery stated, "Potentially, we could have lost the whole alternate command post and maybe even the building it was parked next to." He said that the most probable cause of the fire was electrical. Heat tape was used to wrap a storage tank on the train. The tape was sprayed with an insulation and plugged in to keep the tank's contents from freezing. "It shorted out, causing enough heat to cause the fire." **Arctic Warrior 91 - Credit one save.** The ACE/ALCOP was deployed in January-February 1991 to participate in Arctic Warrior 91 which replaced the former BRIM FROST exercises. The ACE/ALCOP had deployed to Talkeetna and operated there during the entire exercise. The significance of the successful deployment was the involvement of the members of the ACE/ALCOP in saving a downed civilian pilot that crashed near the deployed location.

On the afternoon of 4 February in the waning hours of the exercise, private pilot Jay Walker of Anchorage was flying his light plane at about 8,000 feet through the heavy cloud cover of the Alaskan Range, approximately 23 miles north of Talkeetna. Walker was uncertain of his location and rapidly running low on fuel. He radioed for help on a frequency used for distress calls. A 962nd AWACS E-3 returning from an Arctic Warrior mission picked up the pilot's call for help. The AWACS crew was able to pinpoint Walker's location by having him change through several frequencies on his radio. Once Walker's location was identified, Captain Lee Gardner, Senior Director aboard the E-3 alerted the Elmendorf Rescue Coordination Center (RCC) through contact with the ROCC. The ROCC controllers in turn

alerted the Anchorage FAA Center providing the bearing and range of the distressed aircraft. The FAA then directed the lost pilot at that point, advising a southerly heading of 220 degrees back to the nearest landing facility at Talkeetna airport.

The AWACS crew continued the only radar contact with the lost pilot. As the lost pilot approached the Talkeetna area an Alaskan Air National Guard C-130 aircraft was in the process of practicing approaches and landings at the airfield. The C-130 was made aware of the situation through the E-3 and turned to assist and follow the distressed aircraft in. But Walker's fuel had run out and the plane crashed on approach in a wooded area about 200 yards north of the field.

The ACE/ALCOP had been monitoring the radio traffic and distress calls. As soon as word of the crash was relayed by the C-130, ACE/ALCOP personnel called the Talkeetna airport rescue team and then swiftly dispatched a six-man rescue team of its own. The six individuals were: Capt Kent Steele, Elmendorf Regional Hospital; MSgt Gregory Hall, SSgts Carroll Hollier and James Taylor of the 11 ACW; Marine Corporal Bradley Rice from Glenview Naval Air Station; and TSgt William Allen, 11 AF Historian.

The C-130 began to circle above the crash site, relaying information to the ACE/ALCOP which in turn relayed positional information to its dispatched ground rescue crew. Corporal Rice arrived on the scene at nearly the same time as two rescue personnel from the airport while the rest of the team drug medical supplies and rescue equipment through the snow to the site. Rice and two others extracted Walker from his badly damaged plane. Capt Steele then directed the on-scene emergency treatment with medical supplies brought from the train.

Walker, though dazed and bleeding from a gash above the eye, was still conscious and in good condition. Cold weather exposure was not a factor in the injury thanks to the rapid response of the rescuers. The entire incident played like an Arctic Warrior exercise scenario "right out of the book." The RCC awarded one save each to the 11 ACW, 962nd AWACS and the ANGs 144th Tactical Airlift Squadron.

**Litton Tactical Display Console (TDC) Demonstration.** During Arctic Warrior 91, the TDC was deployed aboard the ACE/ALCOP. The TDC provided the ACE commander with a real time picture of the location of friendly air, land, and sea forces while also showing the locations of hostile forces being engaged or under surveillance. The TDC was able to link via HF radio with the E-3 and ROCC to provide real time air picture to the ACE. The TDC was 100 percent reliable throughout the demonstration and connectivity was easily achieved and maintained. It was also considered easy to set up and operate and gave an easily interpreted picture.

**Suffering From Asbestos.** On 8 August 1991, the ACE/ALCOP and its indoor facility was quarantined by the base bio-environmental engineer due to the confirmed presence of asbestos in the railcars' exterior steam pipes and fittings. Abatement of the asbestos was completed on 28 August but a detailed survey of the cars was required prior to planned interior modifications to the storage facility, communications and consoles, and the battle staff area. A limiting factor was issued for non-availability of the ACE/ALCOP during the asbestos abatement and survey process.

During this time, the mission was fulfilled by the NORAD Airborne Battle Staff aboard an E-3. The asbestos removal was completed on 24 September. Samples taken from the interior of the cars did not contain any asbestos. On 30 September the ACE/ALCOP was transported to the ARR yard in downtown Anchorage for further repairs and maintenance.

**A Visit from the White House.** A White House military team visited Elmendorf from 16-18 October 1991 to tour the ACE/ALCOP and ROCC. The purpose of the visit was to observe command and control rail car design operations, communications, connectivity, and contingency support programs. White House military planners were conducting a study to determine the feasibility of similar rail operations for presidential contingency communications support.

**REPLACING THE ACE/ALCOP RAILCARS**

Funding for the ACE/ALCOP had been a problem ever since the wing had assumed operational responsibility for it in 1986. Historically, there had never been a specific budget line item for the train. The associated costs of operation were taken "out-of-hide" from the wing's Operations and Maintenance (O&M) budget each fiscal year. Additionally, there had never been any manpower funding for positions aboard the ACE/ALCOP. These continued to be filled as additional duty requirements from the wing's Operations and Logistics personnel. Each year the usable life of the 45 year old railcars grew more precarious. There was only so much that constant maintenance and upgrade could accomplish. Replacement of the railcars had never been a priority with AAC/11AF or PACAF. In the 1990s, the new era of shrinking defense budgets made it obvious that the investment costs for new railcars was too high, and by 1991 the railcars were within two years of their useable life. In order for the wing to continue operating the train, a waiver would be required from ARR and the Air Force to move on the rail system.

In September 1991, the tank car was retired when it failed to pass a standard pressure test. So, when word came of the likely possibility that the mobile Peacekeeper MX Missile program would be terminated, the 11 ACW immediately expressed an interest in acquiring six of the sixteen Peacekeeper Rail Garrison railcars.

**Rail Garrison.** The Peacekeeper railcars were the original prototype research and development and test bed railcars designed to transport and operate the mobile MX missile. Called Rail Garrison, the idea was to garrison the train with the MX missile and command and control cars until needed or exercised. When needed, the train would leave its garrison and travel along many possible routes of commercial rail lines in an attempt to prevent targeting by an enemy. After the Rail Garrison program was canceled on 27 September 1991, the wing reaffirmed its interest in acquiring six of the railcars from HQ Ballistic Missile Office (BMO) at Norton AFB, California, the agency in charge of the program. Personnel from

Eielson AFB were also interested in getting two locomotives from the program for transporting coal to their base power plant.

In a 7 October 1991 letter to BMO, Colonel Harry J. Kieling Jr., 11 ACW commander, reemphasized the interest in six of these cars, should they become available. He noted the Air Force's capital investment of $20.55 million for the six cars: 2 Security Cars at $4 million; 2 Launch Control Cars at $6 million; a Maintenance Car at $500,000; and a tank car at $50,000 each.

Transportation costs in shipping the cars from Vandenberg AFB, California to Anchorage was approximately $18,000 to 25,000 per car, or $115,000 to $150,000 for the package. The replacement costs for the existing ACE/ALCOP using "used" cars: $15,000 to $20,000 for a tank car; $15,000 for the maintenance box car; and $124,000 each for the command, messing, and berthing cars.

On 21-22 November 1991, Colonel George A. Pahls, 11 ACW Deputy Command for Operations, Lt Col Steven P. Hockett, 11 ACW Deputy Command for Logistics, and MSgt Gregory Hall (ACE/ALCOP NCOIC) traveled to Norton and Vandenberg AFBs for the purpose of assessing first hand the feasibility of replacing the existing ACE/ALCOP railcars with the Peacekeepers.

The men came away from their visit convinced that no other railcars could be obtained elsewhere that could be so easily modified to support the ACE/ALCOP requirements at the low cost of $70,000 to transport them to Alaska. MSgt Hall concluded in his trip report:

> ...These cars were engineered for mobile C3 in a hostile environment. As a mobile C3 platform, their structural designs meet or exceed stated needs for the ACE/ALCOP mission in the NORAD Statement of Requirement (NSOR), and alleviate discrepancies identified in the Executive Summary Alaskan Command C3 Architecture. Additionally, these railcars will provide continuity in maintaining a mobile C3 platform for theater training and test-bed programs.... The bottom line is no other railroad cars can be obtained elsewhere and modified to support existing stated requirements, at a lesser cost.

**Other Replacement Ideas.** While MSgt Hall was working to gain approval for the Rail Garrison railcars, several other proposals to replace the ACE/ALCOP were revisited and studied. One proposal was a fixed facility at Fort Greely. In a conventional scenario it would probably be survivable. However, the costs of arctic construction and MILCON restrictions would prevent it from becoming a reality. Another proposal was to convert the ACE/ALCOP to a road mobile configuration. This option called for the use of converted trailer or container vans or buses. However, the penalties of all weather operations and deployability was limited.

With the drawdown of the Ground Launch Cruise Missile (GLCM) force in Europe, another possible replacement for the railcars existed--the acquisition of the GLCM Launch Control Centers (LCC). The LCC was an armored box mounted on a trailer and contained built-in communications systems (HF, VHF and UHF SATCOM). The system included its own tractor and could move over highways, roads and off-road as necessary for dispersal. However, acquiring these vans posed problems with possible violations of the INF treaty and was dropped.

**Pressure from PACAF.** On 2 January 1992, Lt Gen Malcolm Armstrong, PACAF Vice Commander, questioned the need for continued operation of the railcars and acquisition of Rail Garrison assets in light of the assumed "threat" and budgetary constraints. His message to Lt Gen Thomas G. McInerney, 11 AF Commander stated:

> Recent dynamic world events force us to continually reevaluate our previously held operational concepts. Redundant systems that provide for continuity of operations must be scaled appropriately. The ANR alternate command and control functions are satisfied by the Alternate Command Element who would work from a complex of railroad cars and by the NORAD Airborne Battlestaff on board a designated E-3. [You] identified railcars from the peacekeeper program that could possibly be used to upgrade the ACE rail facilities. Although the cost to transport, reconfigure and maintain appears to be small, maybe the time has come to walk away from the capability that this option provides. Suggest consideration be given to reliance on only one back-up, the NABS on board the E-3.

The wing responded to the message to Lt General McInerney by stressing "the validity of the ACE/ALCOP requirement [is] based on the perceived absence of the threat in the face of recent dynamic world events. It is precisely that dynamism that should make us wary of forsaking a capability in which so much is invested (approximately $895,000) and which can be maintained for so little." (About $25,000 annually). The wing convinced Lt Gen McInerney that current ACE/ALCOP concept was still valid and Rail Garrison replacement cars were the best solution to replacing the existing railcars. In his 30 January 1992 message to the Lt Gen Armstrong, Lt Gen McInerney stressed four major reasons he wanted to keep the ACE/ALCOP with Rail Garrison assets, he noted:

> -The existing railcars are enduring, survivable and mobile but are nearing the end of their useful service life. The Peacekeeper Rail Garrison cars would extend the life of the ACE/ALCOP and are also hardened against high impact electromagnetic pulse damage.
> -The NABS (NORAD Airborne Battle Staff) on board the E-3 is important to support daily contingency operations. However, with only one of the Elmendorf based E-3s available, the E-3 platform itself does not provide adequate sustainability.
>
> -...Excess Peacekeeper Rail Garrison railcars as [are] a low cost replacement for the aging ACE/ALCOP railcars. With full understanding of the shrinking budget, any effort to reconfigure the new cars would be performed using very limited self help resources.
>
> -Current budgetary limitations notwithstanding, it is my intention to maintain the existing railcars in their indoor garrison location, in a non-use status and at no cost, pending higher headquarters tasking for exercise participation. If for no other reason, it is prudent to maintain the existing cars to serve as a deployable command and control platform to support the JTF-AK commander in times of emergency or natural disasters.

By March 1992, HQ BMO had offered to absorb the cost of transporting the railcars to Elmendorf. However, on 6 April 1992, HQ PACAF again attempted to sway Lt General McInerney's opinion on the ACE/ALCOP. The PACAF Vice Commander suggested that in lieu of an E-3 being designated the primary ACE/ALCOP, a plan be developed using an organic C-130 aircraft with appropriate

communications. The Vice Commander felt "such a plan would greatly increase the flexibility, survivability, and reconstitution responsibilities...." Again, General McInerney restated his position and General Jimmie V. Adams, CINCPACAF, remarked "Uncle. I give in. Let them have the train but tell them there is no additional money."

The wing was cleared to obtain the railcars for the ACE/ALCOP on 31 March 1992. However, Brigader General Iverson, Deputy Commander for Operations, HQ PACAF, placed stipulations that rehabilitation of the cars for the ACE/ALCOP would be done with the use of self-help and existing resources and with no additional O&M funding on the 11 ACW. At that point, final disposition of the Peacekeeper railcars rested with the Air Staff.

**Back on track.** On 19 June 1992, Major Paul S. Curtis, Chief, Operations Division at BMO notified the 11 ACW that the Air Staff gave them permission to ship six Rail Garrison railcars to Alaska. The six cars were shipped by rail to Seattle where they were weighed by Burlington Northern personnel prior to loading on a railcar barge. The weight of the six cars was 1,762,400 pounds and took up 73,837 cubic feet of space on the barge.

Each car's value was listed on the requisition and invoice/shipping document and totalled $19,958,553.00. Individually the cars were valued as follows: (1) Maintenance Car TBCX90050 = $371,276; (2) Security Car DAFX0004 = $2,280,460; (3) Security Car EMS2 DAFX0003 = 2,280,460; (4) Fuel Car TBCX90001 = $93,163; (5) Launch Control Car DAFX0002 = $7,466,597; and (6) Launch Control Car DAFX0006 = $7,466,597.

The Rail Garrison cars arrived at Whittier, Alaska on 5 August 1992. Due to bad weather, the cars weren't off-loaded until the 6th. MSgt Hall met the barge at Whittier and rode the train back to the ARR railroad yard in Anchorage. On 7 August 1992 the cars arrived at Elmendorf after almost a year of work on the project. The cars remained at Elmendorf and, as planned, would be time phased

modified and outfitted to operational status in two to three years when the existing railcars reached the end of their fifty year service life.

**A Final Deployment?** On 26 October 1992 the ACE/ALCOP deployed for possibly the final time. During Exercise Vigilant Overview 93-1, the ACE/ALCOP was deployed near Clear AFS from 26-30 October 1992. The train successfully departed from Elmendorf despite a blinding snow storm that closed the base. For two days during the deployment, command of the ANR was successfully transferred to the Battle Commander aboard the train where he and the ACE staff conducted flight operations for the region.

Because of the severe winter weather, some small problems arose. These included power production problems with the generator car being exposed to below freezing temperatures and most personnel deployed on the train lacked proper arctic gear. While some of the gear may not have seemed necessary for everyone assigned, the extensive power failures sometimes showed the potential for cold weather injury.

Despite these problems, the deployment was highly successful. One interesting recommendation that surfaced after the deployment concerned clothing. It was the use of a special uniform for the members of the ACE/ALCOP. In a non-military community the train may be deployed near, the in-use Battle Dress Uniforms stood out "like a beacon." It was suggested that members wear brown coveralls to maintain a stealthy operation. Unfortunately the suggester did not address the arctic gear problem.

**Air Force Audit Agency Audits (AFAA) Train.** On 4 December 1992, Mr. Stephen Nebeker reported the results of an AFAA audit of the ACE/ALCOP train that was conducted in November. The audit looked into the areas of Resources, Accountability and Directives governing the operations and maintenance of the train. The objective of the audit was to determine if the railway program at Elmendorf was managed effectively and efficiently. Specifically, four factors were to be determined: (1) if railway equipment on hand was being effectively used to

meet mission requirements; (2) if the equipment custodian performed necessary periodic maintenance; (3) if the equipment custodian accounted for railway cars properly; and (4) if overall efficiency could be improved.

The overall evaluation of the program was satisfactory with problem areas in accountability and operational efficiency. The audit read:

> Generally, the railway program at Elmendorf AFB was managed effectively but could be more efficient. Railway equipment on hand was being effectively used to meet mission requirements. Also, the equipment custodian performed necessary periodic maintenance. However, the equipment custodian did not account for railway cars properly. In addition, base personnel could improve overall efficiency.

The equipment custodian did not properly account for the newly acquired equipment with base supply in a timely manner, therefore approximately $20 million in assets were understated in Air Force equipment records. The auditor recommended that the wing or group commander insure proper training and the records be updated as soon as possible.

The wing commander agreed with the auditor's finding and noted that the transfer documents were not received by the equipment custodian until 10 November. Colonel Kieling further commented that the equipment documents were locally updated to reflect authorized and on-hand equipment using the same Table of Allowance used for the older railway cars. He clarified the accountability issue when he replied:

> The newly acquired Peacekeeper railway cars were acquired as replacements for the aging operational cars. Because these cars were for Operational Test and Evaluation of the Peacekeeper program, they were never assigned National Stock Numbers or entered into the Air Force railway equipment inventory. The acquisition of these railcars was approved by CINCPACAF, HQ BMO, and Air Staff.

The finding in operational efficiency was a dramatic finding considering all the discussion that had taken place about the future of the train. The Auditor

reported that "personnel have an opportunity to reduce costs and improve efficiency of the railway program." He stated:

> They could accomplish this by acquiring a modern Air Force-owned locomotive. Alaska Railroad charges at least $1,700 each time its locomotives move any railcars in the local area. In addition, a recent off-base periodic training exercise cost $30,580 for locomotive support and pre-move inspection services. Therefore, 11th Operations Group personnel requested two excess older locomotives be transferred from Eielson AFB in order to lower costs and have a locomotive immediately available. However, these locomotives have numerous problems in maintenance, operator training, and replacement planning.

The auditor pointed out that the two locomotives at Eielson were built in the early 1950s by Baldwin Locomotive Works, a company no longer in business. Therefore, parts and depot maintenance were not available and local maintenance was difficult because few mechanics were trained to work on the antiquated equipment. He noted that the locomotives were quickly approaching their operational life-span and would have to be replaced in one or two years. He also noted that one of the locomotives needed expensive wheel flange repairs before it would be rail worthy.

The auditor made the wing aware of two new GP-40 locomotives that were available at Fort Eustis, Virginia. He recommended that the wing drop its request for the Eielson locomotives and request one from Virginia. Acquisition of a new one would reduce repair and maintenance costs, provide an Air Force-owned locomotive for rapid response in moving railcars, and reduce ARR contract costs by $21,000 per year. He concluded that the Air Force would save over $127,000 during the current 6 year defense budget through this process.

Colonel Kieling again agreed with the auditor's findings. He noted that Eielson AFB was acquiring two new GP-40 locomotives in 1993 but the old locomotives would be unserviceable. Therefore, the wing's request for transfer of the locomotives had been withdrawn on 30 September 1992. He further commented that "because of the scope and expertise necessary to acquire a locomotive, we are

working the 11 AF/LG to determine if having a locomotive is to our advantage." A study of the acquisition would include anticipated acquisition, transportation, and annual O&M costs. It would also review the potential savings the auditor pointed out.[2]

**ACE/ALCOP - "Gone the Way of the Train?"** By the end of 1992 the 11 ACW possessed a bonified capability to perform the ACE/ALCOP mission for several decades to come. Questions about the future of the train continued to surface from several different agencies in the wing, 11 AF and PACAF. These agencies seemed primarily concerned with the "new threat", or lack there of, and budget constraints. If and when the decision is made for the ACE/ALCOP to "go the way of the train," leadership will have had but a few choices -- keep a proven low-cost C3 system operational, either in-place or deployable, or mothball it until another threat arises.

[2]The joint 11AF/LG and 11 OG/OGC study had an estimated completion date of July 1993.

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*NOTE: All information used in this study was taken from unclassified or declassified sources.*