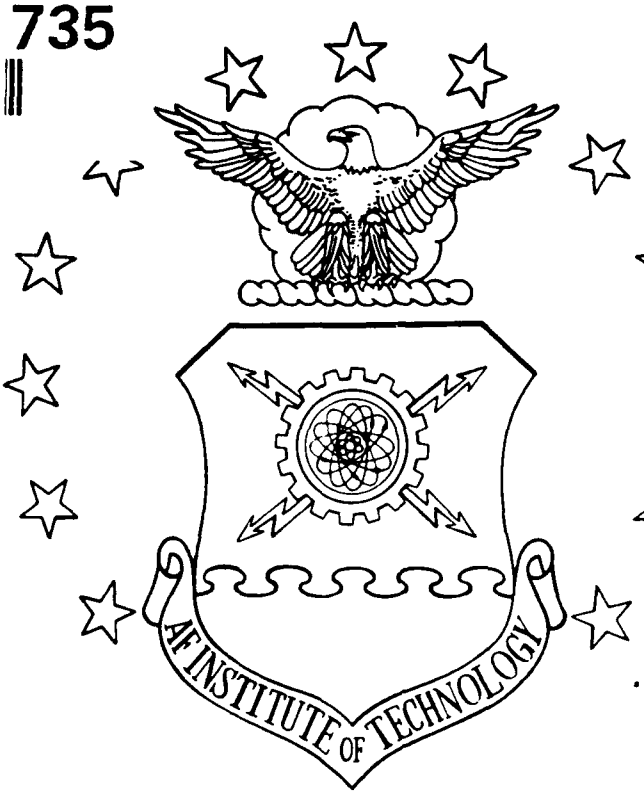

AN EVALUATION OF THE UNITED STATES AIR FORCE VEHICLE BURDEN-SHARING PROGRAMS

THESIS

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AFIT/GLM/LSM/91S-19

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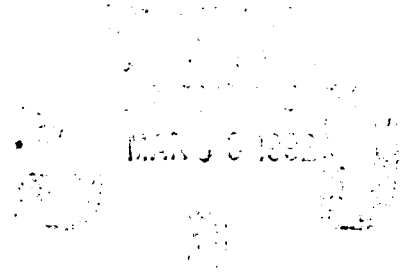

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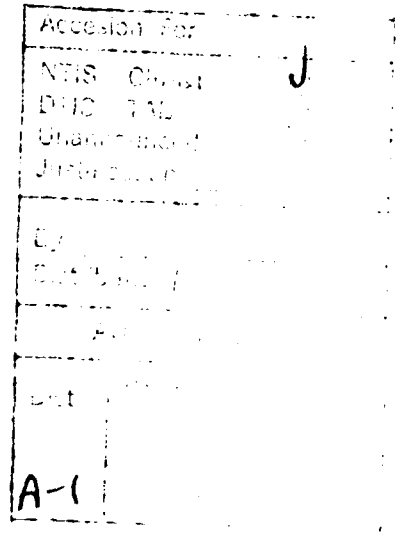

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AN EVALUATION OF THE UNITED STATES AIR FORCE VEHICLE BURDEN-SHARING PROGRAMS

THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Logistics Management

Harold E. Frary, B.S.

Captain, USAF

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Abstract

The purpose of this research was to examine the issues surrounding the U.S. Air Force vehicle burden-sharing initiative with South Korea. In doing this, the study examined additional vehicle programs with the South Korean government as well as with NATO alliances to provide an historical background and insight into the concerns that faced vehicle managers with those programs. In addition, several transportation experts throughout the Department of Defense were interviewed for their perspective of the vehicle management issues which relate to these programs.

This research revealed several issues that continue to concern transportation experts. These areas include the accurate and comprehensive specification of the vehicle requirements, the reduced degree of U.S. control over shared vehicles, vehicle supportability and maintainability, and the curtailment of U.S. organic line haul capabilities within South Korea.

The researcher's recommendations included the establishment of detailed procedures for both U.S. forces as well as the South Korean forces. Furthermore, the researcher proposes vehicle functional area experts be involved in the initial and subsequent vehicle requirements negotiations with the host nation; often transportation

managers' ideas for a suitable substitute are not compatible with the users'.

AN EVALUATION OF THE UNITED STATES AIR FORCE VEHICLE BURDEN-SHARING PROGRAMS

I. Introduction

General Issue

Today, logistics planners must confront a very broad challenge which governs the future of the United States' combat forces and their ability to assert the national will. This challenge is a financial one, one of obtaining defense dollars during a period of economic reorganization (Keller, 1989:16). President Bush's FY90 defense budget called for no real growth above inflation, and projected only one to two percent growth above inflation through FY92. Some observers believed, however that these projections were unrealistically generous for defense and that efforts to curb the Federal deficit could actually lead to defense budget reductions of from 60 billion dollars to 100 billion dollars (from a base of 1.26 trillion dollars) (Congressional, 1989:14).

Common sense dictates that the United States Department of Defense (DoD) reexamine its global obligations to bring its military forces into line with its financial ability to support the commitments. With United States treaty obligations to more than 40 nations and restricted means

with which to meet those requirements, something must yield (Keller, 1989:17).

The United States Air Force vehicle funding programs are not immune to the ramifications of a reduced defense budget. In fact, vehicle funding initiatives are often the first to go when competing for the dollar with other Air Force and DoD systems. During the period from 1980 to 1989, USAF vehicle authorizations increased by 46,353 to 152,839. Although many authorizations remained unfilled, the Chief of Staff of the Air Force expressed concern (McAllister, 1989). This concern stemmed from the fact Air Force vehicle authorizations were increasing with no prominent reasons at a time when defense dollars were dwindling. General purpose vehicles were vulnerable and often fell prey to budgetary cuts because they were not glamorous; they were not the primary weapon systems of the Air Force; their costs were relatively small when compared to many of the weapon systems under development; and the effects of such a cutback were often not immediately felt (Jung, 1991)(Gibbs, 1991). Subsequently, vehicle authorizations were closely scrutinized and many deleted. In fact, 4,040 vehicle authorizations were initially deleted and another 2,200 were to be deleted over the next three years (McAllister, 1989).

In a message from HQ USAF/LE, Washington, DC to all the Air Force Major Commands (MAJCOMs), the Air Force's senior military logistician stated:

> Initially suffering a 60 percent proposed reduction to $96 million from the FY92 "position" in the FY91 President's budget, the vehicular replacement program recovered to a level of $181 million in FY92 (still a 15 percent reduction).
>
> Two widely disparate conclusions were evident as a result of the FY92 exercise: there is a leadership perception the Air Force has too many vehicles (sedans and other selected passenger carrying); and our data for POS [peacetime operating stock] shortages and replacement eligible vehicles clearly show the Air Force vehicle replacement program is severely underfunded, especially for critical mission-related vehicles.
>
> In view of the austere vehicle replacement funding profile, it will be necessary to direct more monies to the operational support categories. We will not fund sedans (except armored, OSI, and law enforcement), station wagons, surrey buses (with perimeter seating), 3-passenger 4X2 pickups, and inter-city buses (except USAFA and band support) in FY92 and FY93. Further, AFLC is being directed to terminate procurement action on all un-contracted replacement vehicles for these same types regardless of the fiscal year in which they are funded. Foreign-buy vehicles are included. (HQ USAF/LE, 1990:1-2)

The impact of this directive would be felt first and foremost in the overseas areas. In addition to the impact caused by limiting the procurement of United States manufactured and foreign bought vehicles, the overseas bases felt the effects of reduced second destination transportation (SDT) funds (Jung, 1991)(Gibbs, 1991). As United States manufactured vehicles were bought and became available for shipment to overseas locations, SDT funds

often were not available to transport the vehicles from the United States port of embarkation to the final overseas location (Jung, 1991)(Gibbs, 1991). This resulted in delayed vehicle shipments to the overseas locations or in some cases, redirected shipments that never reached their original overseas destination.

Consequently, logisticians were forced to make due with existing resources or develop alternative methods for obtaining the required assets. Logisticians must determine the right combination of finite forces and resources that will allow for the flexibility and sustainability which are insisted upon by the commanders. Logisticians must also understand that there is no longer the era of carte blanche. With these challenges pending, logisticians must determine if the fiscally constrained United States forces are still capable of accomplishing their mission. If the mission can still be accomplished, then no modifications would be necessary. However, if the mission is impacted by economic circumstances and cannot be performed adequately, then one of two things must happen: either the mission must change so that existing resources will suffice or resources from additional sources must be sought (Keller, 1989:17). One alternative to the diminishing resources is to rely on the host country to provide resources or supplementary funding. In other words, share the burden.

Although there is little doubt that our conventional forces will continue to modernize, it appears that the

economic and political climate will dictate a slower pace than in recent years with more selective funding and possibly an increase in cooperative programs (Congressional, 1989:14). A number of avenues have been explored for ways to continue our defense modernization, but with a more equitable distribution of the direct financial burden. In Europe for example, NATO cooperative programs could offer not only potential cost savings, but also the opportunity to achieve greater standardization and interoperability of military equipment throughout the alliance (Congressional, 1989:13). United States Air Forces Europe (USAFE) maintains a longstanding, successful partnership with NATO members which continues to promote the Air Force's vehicle program through foreign vehicle buys, host nation support agreements, and wartime host nation support agreements. The European theater is not the only region that is benefiting from these type of arrangements however.

In the Asia/Pacific region, the United States' military strategy for deterrence has also been successful. Asian and Pacific countries are continuing a period of explosive growth. In fact, some of the United States' allies are its most vigorous economic competitors (Hardisty, 1990:16). This regional economic fervor melds well with the United States' national security objectives, objectives bridled by U.S. financial constraints, however. As the United States plans to scale down its operations, Asian and Pacific countries are willing to increase their contribution for

regional defense. This form of alliance support is known as burden-sharing and denotes a concept whereby one tries to assess each member country's contribution in order to determine what its fair share of support will be. However, no universal definition of burden-sharing exists because a burden is composed of shared roles, risks, and responsibilities. Alliance support may come in many forms, such as the sum of defense expenditures a country contributes toward its fair share, which may include weapon systems, technology, vehicles, labor, etc (Sadoff, 1989:33).

Congressional burden-sharing initiatives have sought to encourage the allies to increase annual growth rates of defense spending and to improve the quality of the alliance's equipment in the field. Senator Sam Nunn has led the effort to design a process by which the United States and its allies first determine defense needs for weapons or other equipment, then agree upon jointly funded projects to produce the necessary capability. In the long run, such joint development could conserve resources through economies of scale, enhance defense capabilities through a standardization of equipment to be used by different forces, and improve military planning by jointly determining needs rather than relying on possibly redundant or fragmented national efforts to achieve a coherent defense (Congressional, 1989:27). Additionally, "burden-sharing is good for the host country because the dollar stays right in their country and is used to help in the industrialization

of the country" (Colson, 1991). It is these benefits which the United States is pursuing under the burden-sharing umbrella.

The dynamic growth of the Pacific region makes it in our long-term interest to help build and institutionalize a greater sense of collective purpose among the Asian and Pacific nations that share our economic and political values. The United States is on its way to establishing new agreements to facilitate such cooperation (Baker, 1990). As the United States Government establishes bilateral relationships, with the Republic of Korea for example, a shift in the burden will move from a United States dominated effort to one with equal partners. Secretary Baker continued to say that these relationships will help the United States pursue a number of objectives in the region. First, it would help demonstrate strong United States engagement, highlighting that the United States is a Pacific power as well as an Atlantic one. Secondly, the shared support will help coalesce bipartisan domestic support for this engagement. Also, this new effort will help identify and overcome barriers to more efficient flows of trade, capital, and technology so as to enhance economic growth. And finally, this new foundation will heighten the sense of mutual responsibility among all these economies, especially some of the newly successful ones, to support an open international trading and investment system (Baker, 1990). The Republic of Korea is one Pacific country that has the

infrastructure and capability to support our defense objectives in the region.

In fact, South Korea has sustained an average annual growth rate in excess of eight percent and a ten-fold increase in per-capita GNP over the last 20 years (Subcommittee, 1989:33). South Korea's economic vigor furthers their ability to increase their support for national defense by providing for an organic capability, a capability that has been absent in the past. The heightened economic strength of South Korea and its improved defense posture mark the time for the United States to transition to a more supporting role, enabling the Koreans to assume greater responsibility for their own defense. While South Korea is already contributing to the cost of maintaining United States forces on the peninsula, the United States has proposed ways for them to increase their contribution (Hardisty, 1990:20). Included among the initiatives is a vehicle burden-sharing proposal aimed to meet these objectives as well as ease United States defense spending (Van Scotter, 1990f).

As a result of this vehicle burden-sharing initiative, Pacific Air Forces (PACAF) will realize a respectable vehicle funding level for the replacement program because United States costs will be offset by vehicles provided by South Korea. This in turn will provide PACAF the financial flexibility to direct some of the limited United States dollars toward key vehicles, vehicles not offered under the

burden-sharing program. The approach will reduce vehicle acquisition requirements by supporting most general purpose war reserve material (WRM) vehicle authorizations through non-USAF organic sources and will reduce operations and maintenance (O&M) costs by disposing of non-critical general purpose WRM vehicles that are eligible for replacement (Van Scotter, 1990d).

With the rapidity in which these resourceful vehicle burden-sharing programs have developed in the Pacific, there exists the potential for inattention to some details or to have issues that have not been fully addressed. For example, the administration of the vehicles: who would track the inventory, status, or accountability and what procedures would they use? This study highlights some of the potential problems PACAF transportation personnel may encounter with their vehicle burden-sharing program as well as issues and concerns as expressed by Air Force and DoD transportation experts.

Specific Problem

What issues and concerns face transportation personnel in PACAF with regard to the vehicle burden-sharing initiative with South Korea?

Investigative Questions

The major question areas examined in this thesis are:

1. What will the unresolved vehicle administrative (inventory, status, accountability) and maintenance (parts,

repair) issues be for PACAF when the burden-sharing proposal is implemented?

2. Are there "lessons learned" from USAFE transportation programs that may facilitate the PACAF burden-sharing implementation effort?

3. What are the management insights and recommendations from senior logisticians that have worked (or still do work) in the USAF vehicle communities?

4. What are the significant challenges that face logisticians with the USAF vehicle burden-sharing programs?

Scope and Limitations

The vehicle initiatives analyzed in this thesis were limited to current USAF programs in Europe and in South Korea. Specifically, USAFE's vehicle burden-sharing strategies were examined because of HQ PACAF/LGT's interest in their accomplishments (Van Scotter, 1990f). However, the study examined additional vehicle programs with the South Korean government as well as with NATO alliances to provide an historical background and insight into the concerns that faced vehicle managers with those programs.

In addition to the literature examined, several senior USAF and Department of Defense (DoD) logisticians with transportation or burden-sharing backgrounds were interviewed. Their experiences and insights provided meaningful testimony on the issues and concerns of the PACAF vehicle burden-sharing program.

II. Literature Review

Overview

This chapter contains a review of the significant literature relating to USAFE and PACAF vehicle programs. This review had two purposes. First, this review established the significance of the challenges and limitations associated with the USAFE vehicle initiatives so that a background could be set in which to examine the PACAF initiatives. Secondly, this review provided a detailed historical overview of the PACAF vehicle initiatives so comparisons between USAFE and PACAF could be evaluated.

Background on USAFE Vehicle Support Initiatives

Under the broad topic of USAFE vehicle support initiatives lie three distinct programs which have evolved over the past 15 years. These initiatives consist of the foreign vehicle buy program, host nation support (and wartime host nation support) agreements, and burden-sharing agreements. Each program has its merits as well as weaknesses. The following sections provide background information on the significance of the vehicle-related issues for each initiative.

Foreign Vehicle Buy Program. In 1978, the Air Force first conceived purchasing general purpose vehicles from allied host nation manufacturers (Nichols, 1990:1). This concept afforded a logical and economical alternative to

operating and maintaining United States domestic vehicles in a foreign country.

Foreign vehicles are more supportable in their country of manufacture with parts availability being the most important factor of vehicle fleet maintainability (Nichols, 1990:2). The most difficult to obtain foreign vehicle parts are only 48 hours behind requirements. Difficult to get United States parts can take up to 180 days to receive in overseas locations (Nichols, 1990:2). The availability of foreign parts reduced the requirement to buy, stock, and manage large stocks of spare parts. Foreign manufacturers provide free operation and maintenance training.

The foreign vehicle buy program is disciplined by a competitive bidding process between the foreign manufacturers which is similar in nature to the process that governs the U.S. vehicle buy program (Jung, 1991)(Gibbs, 1991). Furthermore, foreign vehicle manufacturers like Volkswagen for example, have not significantly changed their parts lines over the years as some U.S. vehicle manufacturers have done (Jung, 1991)(Gibbs, 1991). With each new purchase, foreign vehicle designs and configurations remain fundamentally the same. The consistencies and similarities of vehicle makes and models in the foreign vehicles have saved countless dollars in parts management, training, bench stock investment, and new tools and equipment. This has resulted in shorter vehicle down times, saved man-hours, reduced in-house operations,

and maintenance training (Nichols, 1990:3). All of these advantages lead to increased supportability and interoperability within the European theater.

Foreign vehicles are economical to own, operate, and maintain despite often higher purchase prices. Long-term operating and maintenance cost of these vehicles confirmed notable savings, even in direct comparison with the cheaper United States vehicles (Nichols, 1990:3). A recent HQ USAFE study confirmed many foreign vehicles operate well beyond their current life expectancies. As a result, this will reduce the annual capital investment of purchasing and replacing these vehicles. Also, foreign vehicles experience less out-of-service time resulting from non-availability of parts (Nichols, 1990:3). When a vehicle is not available for use, the Air Force experiences an economical loss. HQ USAFE found that this economical loss was significantly lower for foreign vehicles because of their lower out-of-service rates than for United States vehicles in Europe (Nichols, 1990:3). Other important cost considerations include shipping and port handling fees which apply to United States vehicles only, in the form of second destination transportation expenses.

Foreign vehicles directly support military mission effectiveness. One concern of opponents to the foreign vehicle is the vehicle's ability to deploy. Although these vehicles would provide a deployment problem, most vehicle types considered for foreign buy are not deployable beyond

the scope of support channels (Nichols, 1990:3). The foreign vehicle lends itself to a positive NATO force integration when bases become collocated with host nation forces. Further, getting spare parts support is easy through in-country sources during contingencies (Nichols, 1990:3).

Some foreign vehicles do have higher price tags than their United States equivalent, yet the life-time costs for selected foreign manufactured vehicles often represent a meaningful savings. HQ USAFE believes that the Air Force will receive significant savings in operations and maintenance costs associated with foreign manufactured vehicles (Nichols, 1990:3). The Air Force has developed a mathematical formula for determining the most cost effective vehicle procurement source. This formula is used as a tool to provide an objective means of determining which are the best vehicle sources (Jung, 1991)(Gibbs, 1991). Refer to Appendix A for a detailed look at the vehicle buy cost formula. This formula applies to both U.S. and foreign vehicles and yields a "cost to own" dollar amount.

European Host-Nation Support Agreements. For years the United States military had silently transferred an increasing portion of its logistics support duties to allied host nations in Europe, culminating with the ground-breaking wartime host-nation support (WHNS) agreement signed with West Germany in 1982 (Kitfield, 1987:30). The agreement was negotiated to help offset serious shortages in logistics

support for United States forces in Germany in times of crisis or war. The agreement also formalized the German intent to provide civilian sector support, such as transportation, maintenance, and repair services (GAO, 1987:5).

United States proponents saw the shift as a way to force Western Europe to pick up more of the alliance's defense tab. Kitfield noted that Europeans, on the other hand, said it makes sense to avoid laying down an entirely independent logistics tail on top of one on the most modern and well traveled transportation networks in the world (1987:30). The costs to establish and maintain the capability to provide WHNS were to be shared by the United States, Germany, and the North Atlantic Treaty Organization. Germany would pay personnel and certain equipment costs for their soldiers as well as specific material investment costs for military command, logistics, and training organizations (GAO, 1987:5).

As United States defense spending continued to dwindle and as the Warsaw Pact dissolved, the need to review some of the arrangements with our NATO alliances surfaced. Ultimately our force structure in Europe will be shrunk substantially; for example the Air Force will go from eight-plus wings to three-plus wings (Colson, 1991). These changes will open the doors to burden-sharing programs as well. According to Colson, there is a difference between HNS and burden-sharing. He says under the HNS agreement,

the service or product that is provided by the host country is still controlled by that country. Conversely, under the burden-sharing concept, the host country would provide a service or product (vehicles for example) and the United States would maintain control over them, at least for a fixed period of time (1991). This important concept is discussed next.

European Burden-Sharing Program. Within the United States, a growing sentiment exists to reduce our troop support and financial commitment to NATO (Sadoff, 1989:1). United States Representatives Pat Schroeder and Richard Gephardt, two leading advocates for reduction, asserted that the United States was paying too much and must decrease its spending (Kondracke, 1987:15-17). They argued that the United States expended $160-170 billion annually to support Western Europe, more than the defense contributions of the other 15 members of NATO combined. They stated that the United States should not continue to pay 6.7 percent of its gross national product on defense when countries such as Germany and Italy pay only 3.1 percent and 2.2 percent respectively (Kondracke, 1987:15-17).

The Report of the Defense Burden-sharing Panel by the House of Representatives Committee on Armed Services, concluded that the NATO allies were not committing their fair share to the alliance. The report asserted that unless drastic changes occurred, the United States should significantly reduce its financial support. To this

committee, burden was analogous to cost; all other factors were irrelevant (United States Congress, House, 1988)

Proponents for maintaining the status quo in Europe argued that the allies were in fact paying their fair share of the burden (McCain, 1988:86). They suggested that contributions to the burden must be measured in more than dollars and cents and that issues such as assumed risk, willingness to provide base rights, and different abilities to pay must be considered in addition to economic contributions. They contended that European allies provided 90 percent of the ground forces, 75 percent of the airpower, and 80 percent of the naval forces (McCain, 1988:87).

Background on PACAF Vehicle Support Initiatives

Under the broad topic of PACAF vehicle support initiatives with the South Korean government lie three distinct programs which have evolved over the years. These initiatives consist of the Korean vehicle buy program, the Korean depot repair program, and burden-sharing agreements. The following sections provide background information on the significance of the vehicle-related issues for each initiative.

Korean Vehicle Buy Program. In fiscal year 1989, the Korean vehicle buy program was implemented. One of the program's main selling points was that local procurement of vehicles would provide flexibility in responding to near-term mission requirements because purchases within six to

nine months were possible, compared with the three to five year lead-time in the USAF central vehicle acquisitions in the United States (Van Scotter, 1990e). Additionally, the Korean vehicles' smaller size make them easier and safer to operate on the narrow, crowded roads of the local driving environment.

The 1989 Korean vehicle buy consisted of 13 6K forklifts (at $19,538 each), 11 1.5-ton trucks (at $10,000 each), and eight crew vans (at $12,875 each) which totalled to $466,994. Similar vehicles purchased in the U.S. would have totalled $505,581 (Howard, 1991). Furthermore, two ambulances were purchased in 1990 for $40,000, where U.S. equivalents would have cost $111,000 (Howard, 1991). Moreover, added savings were achieved because the Korean vehicles required no SDT charges as did the U.S. vehicles.

The USAF maintained possession of all the vehicles purchased under this program as they were funded with United States dollars. The Korean vehicle buy program was not without its limitations however. Funding problems and legal constraints restrained PACAF's ability to buy local vehicles. Van Scotter notes that the 1979 Trade Agreements Act restricted the size of the purchases of not more than $156,000 per stock class, per year (1990e). The Trade Agreements Act mandates that there be no purchases of a foreign end product listed in DFARS 25.403(70) with a total value at or above that specified by the U.S. trade representative which is not a designated country end product

(FAR 25.402(c)) (Rozanski, 1988:59). Also, the declining vehicle procurement budget further hampered PACAF's vehicle program.

Depot Repairs in Korea. Depot repairs and refurbishment were a cost effective means of extending the useful life of vehicles critical to mission support. Additionally, in-theater programs shorten pipeline time and reduce labor and transportation costs. There were three programs initiated in Korea for this purpose. The first two were funded by Air Force Logistics Command (AFLC) and the third was funded by the unit which owned the vehicle (Van Scotter, 1990b).

The first program was the M113A2 (armored personnel carrier) conversion (up grade) program to the M113A3. The work was contracted out to DAEWOO (a Korean company) through the Depot Support Activity of the Far East (DSAFE). Over $3.8 million was allotted for the conversion of 26 M113A2s. The program began in early 1990 and will be completed in 1991 (Van Scotter, 1990b).

The second depot repair program, also AFLC funded, was the R-9 refueler refurbishment program. The plan proposed to repair 2 test vehicles in 1990, 4 in fiscal year 1991, and an additional 10 to 12 per year from fiscal year 1992 through fiscal year 1995 with all work accomplished at Camp Carroll, Korea (Van Scotter, 1990b).

The third vehicle depot repair program was a unit funded approach which allowed for the repair of vehicles

that were normally not eligible for depot repair. The type of vehicles entered into the Camp Carroll program included M-35 cargo trucks, 10K forklifts, and some construction equipment. Vehicles entered into the program had to be justified with a limited technical inspection (LTI) and a statement of need (Van Scotter, 1990b).

Reductions in Operations and Maintenance accounts and AFLC's depot maintenance budget placed all three depot repair programs in jeopardy. Consequently, HQ PACAF/LGT developed a 5-year repair program for M-series vehicles. Under this proposal, 240 vehicles would be repaired over a 5-year period at Camp Carroll. Total program cost was estimated at $1.16 million compared to the $7 million cost to procure replacement vehicles. Additionally, the repair program was expected to extend the useful life of the vehicles by six years (Van Scotter, 1990b).

Korean Burden-Sharing Program. In 1989, HQ PACAF/LG requested HQ PACAF/LGT and 7th AF/LGT (Osan AB, Korea) to develop a proposal for obtaining vehicles and spare parts through cost sharing. A primary reason for this request stemmed from the reduced vehicle budget for replacements, which was having a negative effect on vehicle support and readiness. Over 4,000 vehicles were short or due replacement, but only 2,000 were programmed for PACAF. Furthermore, vehicle replacements were being funded at less than 10 percent of the requirements. Therefore, the impact on PACAF's remaining 2,000 un-programmed vehicle requirement

was substantial. Current PACAF vehicle fleet posture is 15,550 vehicles authorized, 14,734 vehicles assigned for a fill rate of 95 percent. Two thousand, three hundred twenty-six new vehicles are due delivery to PACAF over the next two years; however, 4,156 vehicles will require replacement or will be due replacement during the same time period (Ingwersen, 1990).

Additionally, the lack of second destination transportation funds to ship new vehicles aggravated the problem (Van Scotter, 1990g). Seventh Air Force at Osan AB, Korea was faced with 38 percent of its fleet due for replacement within two years. In addition, the older vehicles also incurred greater operations and maintenance costs than the newer vehicles (Van Scotter, 1989).

The proposal that was put together by PACAF/LGT and 7th AF/LGT asked the Republic of Korea (ROK) to provide vehicles and spare parts under two categories of cost sharing. The first was for WRM. One hundred forty vehicles were requested annually at an estimated cost of $2.9 million. The second support plan was under the combined capabilities support category which asked for 225 vehicles per year with an estimated annual cost of $3.5 million (Van Scotter, 1989).

The requirements of this proposal were based on a five year replacement cycle. Older vehicles would be returned to ROK for reuse, salvage, or resale after five years. Advantages of having vehicles included in the burden-sharing

program included improved supportability and interoperability because: (1) parts availability for the shared Korean-made vehicles would be significantly better than for the U.S. manufactured vehicles in Korea, (2) the Korean-made vehicle fleet would be rotated on a five year basis, effectively maintaining a lower average age than their U.S. counterparts which stay in commission until they are no longer economical to operate, and (3) the differences between make and model of the foreign-made vehicles would not change dramatically from year to year as is usually the case with the United States manufactured vehicles. Part costs were estimated to be at two percent of the vehicle cost (Van Scotter, 1989).

In November 1989, the Commander in Chief of the Pacific Command (CINCPAC) approved HQ PACAF/LGT's and 7th AF/LGT's burden-sharing proposal for the calendar years 1991 through 1993. The proposal requested 1,090 general purpose vehicles to be used for day-to-day support at Osan AB and at Kunsan AB at an estimated cost of $19.3 million over the three-year period. Maintenance of the vehicles would be performed by USAF personnel. Vehicle types excluded from the request were aircraft tows, loaders, and complex, special purpose vehicles. The proposal also included vehicle parts support valued at $730,000 during the same three year term (Van Scotter, 1990a).

This original proposal was expanded to cover two other initiatives as well. The first was a Korean cost-sharing

plan for M-series vehicle depot rebuilds. The primary units supported by this proposal would be communications units, security police, and air-base ground defense units. Under this proposal, the ROK would contract the repair of 136 M-series vehicles per year from calendar 1991 through calendar year 1993. This was an innovative way to save O&M dollars and travel time when compared to returning the equipment to the United States for depot rebuild. And, like other depot rebuild programs, the refurbishment of these vehicles would extend the life cycle by six years and has the potential to save millions of dollars in delaying future vehicle procurement costs. The M-series vehicles that will be refurbished under this program are M-35 (2.5-ton truck), M-1008 (CUCV truck), and M-1009 (CUCV truck). They were located and used exclusively within ROK by PACAF units. The United States Army, through Depot Support Activity Far East (DSAFE) in the ROK, had existing contracts with Korean contractors to perform needed repairs. This initiative had an estimated cost of $1.2 million (HQ PACAF/LGM, 1990).

The second initiative under this plan asked for ROK wartime host nation support (WHNS) of USAF vehicle requirements. Rather than pre-position the vehicles at USAF main bases, HQ PACAF/LGT suggested developing an agreement with the host nation to provide them in time of emergency or war. Over 3,400 vehicles, spare parts, and technical assistance were requested for six locations. The plan called for 969 vehicles at Taegu/Kimhae, 657 vehicles at

Suwon, 866 vehicles at Kunsan/Kwang Ju, and 965 vehicles at Osan/Choeng Ju (Windham, 1990:Atch 2). Vehicles provided to the USAF in time of emergency or war would be maintained by USAF vehicle maintenance personnel stationed at the overseas bases, augmented by deploying maintenance personnel. This maintenance concept required parts support and technical assistance provided through ROK. The vehicles must be in serviceable condition and available for USAF use at the respective bases within 10 days of notification. The 10-day delivery period was based on the planning assumption that PACAF would have advance indications of impending hostilities (Van Scotter, 1990c) (Windham, 1990).

III. Methodology

Overview

This chapter describes the techniques used in collecting the data required to answer the investigative questions posed in Chapter I. These questions stem from the research objective of analyzing PACAF's vehicle burden-sharing initiatives so that meaningful insights and recommendations can be conveyed. The goal in attempting to document these considerations is to address the specific issue also presented in Chapter I, that of, "What issues and concerns face transportation personnel in PACAF with regard to the vehicle burden-sharing initiative with South Korea?"

The following investigative questions were presented in Chapter I:

1. What will the unresolved vehicle administrative (inventory, status, accountability) and maintenance (parts, repair) issues be for PACAF when the burden-sharing proposal is implemented?

2. Are there "lessons learned" from USAFE transportation programs that may facilitate the PACAF burden-sharing implementation effort?

3. What are the management insights and recommendations from senior logisticians that have worked (or still do work) in the USAF vehicle communities?

4. What are the significant challenges that face logisticians with the USAF vehicle burden-sharing programs?

A combination of literature review and personal and telephone interviews were used to answer the investigative

questions. The research began with an examination of the literature on file with Defense Logistic Agency's Defense Technical Information Center (DTIC) of Cameron Station, Alexandria, Virginia. This means provided a rich source of individual study projects, theses, and United States Government reports on United States foreign policy in the European and Pacific theaters. Other sources of literature were obtained through library searches and included periodicals, General Accounting Office Reports, and Congressional Hearings. A third source of literature was electronic message traffic, background papers, and correspondence relating to the research topic.

In addition to the literature search, personal interviews were conducted to provide the detailed information needed to fully develop the USAFE and PACAF vehicle burden-sharing issues. These interviews were conducted with Air Force and DoD officials who were closely involved with the transportation issues surrounding USAFE and PACAF burden-sharing. Personal interviews were used as the primary method of data collection because this survey technique provided an interactive format for probing into the topic (Emory 1985:160). The greatest value of personal interviewing lies in the depth and detail of information because the interviewer can note conditions of the interview, probe with additional questions, and gather supplemental information through observation. As a result,

personal interviews far exceed the information secured from telephone and mail surveys (Emory 1985:160).

However, since the selected experts were geographically scattered throughout the world, from Europe to the CONUS to the Pacific, personal interviewing techniques were not practical for the entire population of respondents. Consequently, telephone interviews were also conducted with the hard to reach or geographically separated respondents. Included as a form of telephone interviews (Emory 1985:170), electronic mail exchanges using the defense data network (DDN) was also employed as a last effort to communicate with the respondent.

The interview process involved asking the experts to identify problems and to propose other issues which they felt important to the consideration of vehicle management intricacies relating to the burden-sharing programs. For this research, an expert was defined as a professional logistician who was prominent within the field and familiar with Air Force logistics. The population of senior logisticians that qualified under these constraints was large and widely dispersed. Therefore, sampling was more appropriate than an account from everyone meeting the criteria.

The interviews were conducted with military and civilian logisticians with transportation or burden-sharing backgrounds (see Appendix B for the list of participants). The experts were selected from HQ USAF, the Office of the

Secretary of the Air Force, HQ US Forces Korea, and the Office of the Secretary of Defense. This sampling should provide for a thorough representation of opinion and not allow for biases that may be established by one operating command or logistics discipline.

Interview Limitations

The most significant limitations with the personal interview technique were cost and travel time. Collectively, these two factors precluded the sole use of this method. Another issue that must be recognized is that of bias. Biased results grow out of three types of error: sampling error, non-response error, and response error (Emory 1985:165).

With sampling error, the major problem is that the sample may not be representative of the population from which it is drawn (Emory 1985:276). To lessen the affects of sampling error, the respondents were selected from several Air Force and DoD functional areas.

With non-response error, the error occurs when the primary respondent selected for the interview cannot be reached. If one is forced to interview substitutes, an unknown but possibly substantial bias is introduced (Emory 1985:165). To lessen the affects of non-response error, every respondent selected to participate in the personal interviews was contacted in advance, thus reducing the

possibility of non-response. In fact, 100 percent participation was obtained with the selected participants.

Response error, the third form of bias found with personal interviews, occurs when the data reported differs from the actual data (Emory 1985:166). There are many ways such errors can be introduced. One way is errors made in the processing and tabulating of data. Another important source of error is the respondent who fails to report accurately or fully. This typically is a problem when the subject area is of sensitive nature or involves ego matters (Emory 1985:166).

There are also limitations to using the telephone for research. The obvious first limitation is that the respondent must be available by phone (Emory 1985:170). To lessen this factor, call backs were performed until the selected respondent was contacted. Limits on the length of the interview is another disadvantage of the telephone method, but the degree of this limitation depends on the respondent's interest in the topic (Emory 1985:171). Emory continues by saying that it has been found telephone surveys can result in less complete responses when compared to personal interviewing because often there is less rapport between the respondent and the interviewer (1985:171).

Interview Questions

For both the personal and telephone interviews, the investigative questions from Chapter I were used as a

starting point to establish the session. As the interviews progressed beyond the range of the preestablished investigative questions, an interactive, probing approach prevailed. Although this method was intended to be open-ended and interactive, each interview was similarly structured so that consistent questions would be asked and consistent replies collected.

IV. Findings

Chapter Overview

This chapter presents the findings that were obtained from the interviews (see Appendix B for a listing of the participants) and from the literature review. The chapter is organized into sections, each addressing specific topics which were deemed important by the interviewees and/or the authors of the literature. These topic areas have been identified under the headings of Requirements, Control/Assurance, Supportability, Maintenance, and Line-Haul.

Requirements

One of the first things that must be accomplished for burden-sharing to be successful is the establishment of the requirements and specifications for the products and/or services that will be shared. Where vehicles are involved, these requirements and specifications may include the types and quantities of vehicles, the receiving locations, the condition of acceptance, and so on. These fundamental conditions are extremely important and must be represented accurately, especially when the vehicles will be received under emergency or contingency circumstances and when time is usually of the essence.

CMSgt Hodson of the Vehicle and Equipment Division, HQ USAF, who previously worked vehicle issues in Europe, notes

that under the NATO wartime host nation support agreements, one must ensure the documentation is fitting so that the U.S. Air Force planners and vehicle managers feel reasonably assured they will receive the vehicles in the allotted time. He also added the location where the vehicles were to be delivered needed to be set up to accomplish the reception and that proper tools and equipment needed to be in place to configure the vehicles, when applicable, once turned over to the Air Force (1991).

The types of vehicles requested may also cause concern because what is requested by the United States may differ significantly from what is provided by the host nation. The host nation may interpret the requirement for a pick up truck to be something completely different from what the United States had in mind. The two countries must come to a mutual agreement on each requirement, even if it requires providing photographs and drawings (Hodson, 1991). According to Lt Col Cavin of the Mobility Division, Joint Chiefs of Staff and who worked vehicle issues while stationed in Europe said, "The host nation will give you what you asked for, as they interpret the requirement. This is even more of a concern with the special purpose vehicles" (1991).

When setting up the requirements with the host nation, it is particularly important the using functional area people are involved. The lack of functional area user involvement was an issue in Germany with refueling vehicles

according to Hodson (1991). He said the German Air Force used one type of mobile pumping system, which did not pump fuel at the same rate U.S. type pumping equipment did. So even though it may have met the requirement to service the same type of aircraft as U.S. refuelers did, it may not meet the requirement fully. Hodson continued to say if the functional area users are not involved in the initial specifications and acceptance, they will contest the transportation planners every step of the way (1991) "We do not want any surprises once the balloon goes up. What we in transportation consider a suitable substitute does not necessarily mean it is a suitable substitute in the users' mind" (Hodson, 1991).

Control/Assurance

The control over inventory, accountability, and status of shared vehicles by U.S. Air Force personnel also raised some concern, particularly during the transition from a peacetime environment to a contingency environment. Mr Colson, of the Office of the Secretary of the Air Force, stated that:

> Anything you do not have full control of, that is, you can put you hands on and say these are mine, set them aside, and lock them up, and control them 24 hours a day... anytime you don't have that kind of control, there is the potential of providing friction, especially in the case of an emergency. (1991)

However, Colson caveated his assertion and said he had a lot of faith in those nations that have a real threat. Prior to the fall of the Berlin wall, the Germans were very serious about host nation support; their international survival depended on it.

In the case of South Korea, they understand all too well the threat. Colson said he personally has a great deal of confidence in the host nation which recognizes their national survival is at stake (1991). The intensity in which the South Koreans practice is indicative of their seriousness. Colson feels that anything the South Koreans have, they will make available to us during war. In a similar scenario, Colson related what actions occurred between Saudi Arabia and the United States during the Desert Storm conflict:

> Once a political commitment is made, everything they [Saudi Arabia] had was made available to us, ground transportation, vehicles, buildings, and accesses. So while we are reluctant in deliberate planning to count on it, I think our recent experience would indicate that if it is there, they will make it available. (Colson, 1991)

There was some concern, however, with using shared vehicles if the vehicles ever had to be deployed beyond the South Korean borders. Colson again uses the Desert Storm conflict as an example. He said:

> In Europe we would move the entire 7th Corps out of Europe to the Persian Gulf. We were able to do that because we were totally and fully self-sufficient. Everything that the 7th Corps needed,

> they owned. If the 7th Corps depended upon its combat service support (the equivalent of our general purpose vehicle fleet) to be provided by HNS or burden-sharing, then their ability to pick up and move and go somewhere else would be severely limited. A word of caution, if we become dependent upon our mobility capability (our combat service support) or our combat support infrastructure, then our ability to deploy or employ that other than that in which it is specifically planned in the country, becomes limited. (Colson, 1991)

However, the pros associated with burden-sharing far outweigh the cons and we must realize that the South Korean assets are provided to the United States to aid in their self defense and will be made available for that purpose (Colson, 1991). There may be bigger political hurdles to over come if the assets were deployed out of country. We certainly do not have the flexibility of decision making if we do not own the vehicles than as if we did own them (Colson, 1991). However, in the planning process, we should take that into account. The United States needs to understand that there are limitations and adjust accordingly (Colson, 1991).

Concern was also expressed for the level of detail and exhaustiveness of the host nation's wartime implementation procedures with regard to vehicle support. It is important the host nation follow the agreement process all the way down as far as possible to identify and notify dealers (Cavin, 1991). Eventually the United States and the Korean Government will need to be at a level so that the bread

truck driver that is driving a step van knows that he must report at some predetermined time at some predetermined location. However, one problem that can arise from this level of detail is that the point comes where maintaining the currency of the plan prevents you from continuing. It would take a staff of several people just to keep up with each and every truck owner and operator and where they are located and where they are suppose to report to (Cavin, 1991). According to Cavin, in Europe the United States told the host nation what the overall requirement was; what source they used to provide those vehicles was up to them (1991). However, as the vehicles were recalled and arrived at a receiving station, for an exercise for example, the inventory and status for each vehicle could be verified by tag number which included source, driver, and timing (Hodson, 1991). Accountability was maintained.

The United States will have to trust the host nation to a certain extent because they also may have agreed to provide support to not only their own armed forces, but to their civil agencies, to their equivalent of our Department of Transportation, as well as to the United States' armed forces (Cavin, 1991). The U.S. burden-sharing negotiators often find themselves in a situation where they cannot challenge the host nation; they just have to encourage them to be as detailed as possible in the implementation plan. If there were a national emergency in their country, a typhoon for example, the host nation government could renege

on these agreements because they may decide their priorities are more important than the United States' (Cavin, 1991).

Despite their best intentions, sometimes their people will not participate either. According to Cavin, the United States saw this happen during Desert Storm with our line haul capabilities. The third country nationals from India, Africa, and other neighboring areas which were chartered to drive our trucks walked off the job when the threat of chemical warfare heightened and protection was slow in materializing (1991).

There is an overlap between the WHNS and the peacetime burden-sharing agreement because under a peacetime environment is when we want to test the wartime procedures. According to Mr Ischinger, the Senior Operations Research Analyst - Pacific Region, Office of the Secretary of Defense, "The Koreans are a little worried about having to take a guy who is working for Samsung and pull him off the assembly line so he can go drive his truck" (1991). The Koreans are going to want to minimize the amount of testing that the United States does where any prudent U.S. military planner would want to maximize the testing, because the more practice one does in peacetime, the better one gets in wartime (Ischinger, 1991). This dichotomy between the two nations was also observed between NATO forces and United States planners in Europe notes Kitfield (1987:36). He felt the dichotomy significantly impacted training of the U.S. and host nation military. "Although the 93,000 reservists

[in Europe] earmarked for WHNS duty have all completed their 15 to 18 months of active service, they are called up for only one two-week training session every two to three years" (Kitfield, 1987:36).

Kitfield stated that a number of NATO logistics experts worried that the support demands of the United States military forces in Europe placed on the allied nations may possibly far outstrip their ability to deliver in a real mobilization. Because host nation support relies heavily on local reservists and civilian trucks and transport, the agreements were notoriously difficult to test, even in the military exercises such as Reforger ("Return of Forces to Germany") (1987:31).

One possible solution to this dilemma would involve selectively testing different areas. Rather than a full blown test of the entire plan, one would identify key areas and work out arrangements far enough in advance so the inconvenience is minimal (Ischinger, 1991)(Knowles, 1991). This procedure will still allow military planners to validate concerns and to identify problem areas.

On the other hand, control issues remain a concern for the U.S. forces in Korea as well. According to Col Corcoran, U.S. Forces Korea/J-4, problems lie with the U.S. because we have never really integrated the WHNS vehicles; all we ever did was count vehicles as they arrived from a recall (1991). We need to fully incorporate the Korean wartime vehicles into the scenario to adequately test the

procedure. Additionally, Corcoran perceived no significant problems from the Korean Government during mobilization. He said the Koreans practice seriously and mobilize everybody; it is not an exercise to them, it is a way of life (1991).

One issue that arose in Europe and which took a long time to correct was the potential of double sourcing the same vehicle assets (Hodson, 1991). What they had discovered in Europe was that the U.S. Army, the U.S. Air Force, and the U.S. Navy might all have tried to negotiate through different channels to try to get host nation assets. Each branch of the service negotiated their own requirements and initiatives separate from the other (Hodson, 1991). The barrage of requirements from differing origins made it extremely difficult if not impossible to manage the program and to identify which vehicles were in fact promised to more than one U.S. user.

The burden-sharing initiative between the United States and the South Korean Government will not face this situation. According to Corcoran, the Commander in Chief of the Pacific Command (CINCPAC) wanted to ensure the U.S. military service requirements in Korea were administered through one agency. He added that all the vehicle requirements would be negotiated through the transportation division of U.S. Forces Korea/J-4. Each of the U.S. military services in South Korea would be represented through this single vehicle fleet manager (Corcoran, 1991).

Major questions concerning training, command and control, and differences in doctrine have remained unanswered in Europe (Kitfield, 1987:31). As war planners at NATO headquarters in Brussels point out, the dependency of the U.S. forces on host nation support was already very real, while the systems themselves reside largely on paper (Kitfield, 1987:31). The NATO Military Agency for Standardization tried to establish a common NATO logistics doctrine that would encompass the role of host nation support units. Prime areas of concern were command and control over support movements, clarification of when and how nations would requisition logistics assets, and procedures for crossing military as well as national boundaries (Kitfield, 1987:32).

Army Colonel Joseph Heinlein, a member of the NATO Military Agency for Standardization, said the NATO alliance would never get down to the small but crucial details, such as which forms to fill out when support trains cross national boundaries, or just how and where the handoffs occur between the U.S. troops and the various host-nation support systems (Kitfield, 1987:32). Matching U.S. reinforcements to critical host nation support was another prime concern of NATO logistics planners. In some instances, U.S. troops would arrive in Belgium, marry up with heavy equipment stored and maintained by Dutch host nation support units, and then travel to West Germany where they would be supported by that country's WHNS units. Yet

the mechanisms by which each of those countries activates its HNS units were strictly national and independent of each other (Kitfield, 1987:32).

Supportability

Virtually all the participants interviewed felt the supportability of Korean-made, shared vehicles would be superior to the present situation with U.S. manufactured vehicles in South Korea. Even though Colson admitted he had some initial reservations about supportability issues like parts support and keeping people current in tools, test equipment, and training, he concluded all of these kinds of things seem to work out (1991). In fact, he said based on our experience in Europe, the United States just does not have those problems because we have a core of good European mechanics that work along side the military members in the vehicle maintenance shops (1991).

Others agreed that as long as the Korean-made, shared vehicles remained in country there would not be difficulties and supportability would be exceptional. The Koreans have an exceptional infrastructure established to support their industrialization efforts, vehicle parts support included. The ability for vehicle mechanics to order parts locally is the biggest factor in the success for supportability. Corcoran added that for the years of 1985 through 1987 when he was the Chief of Supply at Osan Air Base, Korea, the biggest challenge he had was obtaining parts for vehicles,

especially special purpose vehicles (1991). He said, "I could not support them. Even for general purpose parts I was looking at 60 to 75 days order cycle time and there was no local purchase. We wasted a lot of man-hours trying to acquire vehicle parts; it was a constant struggle" (1991).

The question was asked about the impact of deploying the Korean-made, shared vehicles out of country in support of a contingency elsewhere. Jung felt the major issue was not with the Koreans, but with supportability (1991). In deploying Korean-made, shared vehicles out of country we would add another resupply pipeline to an already critical area (Jung, 1991)(Gibbs, 1991). In fact, at one point during Desert Storm, Air Staff had discussed sourcing vehicles from South Korea, but the cost and added support problems prohibited that as an option (Jung, 1991)(Gibbs, 1991). He said our alternatives and therefore our flexibility were lessened. Jung recalled a conversation he had with transportation experts deployed to the Persian Gulf during Desert Storm. They mentioned the mixing of vehicles does present problems for supportability, maintenance, and interoperability (1991).

Maintenance

The maintenance of the Korean-made, shared vehicles was not a concern for any of the interview participants. For the kinds of vehicles the United States was planning to receive under the burden-sharing proposal, that is primarily

general purpose vehicles, maintenance was not a factor (Jung, 1991)(Gibbs, 1991). Colson said in his experience the difficult ingredient on the maintenance issues was parts availability. He said:

> We seem to be able to fix almost anything if we can get the parts that we need. In Europe, the availability of parts far outweighs any difficulties we may encounter during the transitioning from peace to war. Because of the way our fleet is structured in the U.S., in which we have some of everything, the vehicle mechanics have the diversity of backgrounding skills. So obviously that has not been a problem. The major constraint in most cases for those kinds of vehicles has been parts availability, not the ability of the mechanic to fix it. (Colson, 1991)

Hodson agreed with Colson's viewpoint that parts availability far outweighed maintenance issues. However, he added one additional element: maintenance concerns for general purpose type vehicles will not be dwelled upon during a contingency. If a general purpose vehicle breaks down and cannot be repaired without a major effort, it will be pushed to the side and replaced. If however, the vehicle was important to sortie generation, then we will focus our attention on it and ensure it gets repaired (Hodson, 1991).

Cavin explained that in many cases the host nation may agree to provide maintenance support even in wartime so that when a vehicle breaks one can take it down to the local dealer to be repaired on a priority basis. All of this presumes that the host nation agrees to nationalize, to go to a national emergency and put the military at top priority

and not try to run a peacetime economy and a wartime economy at the same time (Cavin, 1991).

Line-Haul

A final concern that Corcoran expressed was that of reduced in-country line haul capabilities. Because of force structure reductions, the U.S. Army is giving up line haul transportation next year. Corcoran said by February 1992, there will be no internal, organic line haul capability in Korea; it will all be contracted out (1991). He said this will impact our flexibility and ultimately our mission. Currently, the military uses the U.S. Army's 69th Transportation Battalion for line hauling requirements. When this is withdrawn, we will most likely see an increase in U.S. Air Force line haul, especially between Osan Air Base and Kunsan Air Base (Corcoran, 1991).

Currently, this issue is being negotiated under the burden-sharing umbrella, but the problem remains with who the line haul contract will be let to. The Korean Government wants to use a Korean governmental contract, let to their military and the United States wants to use a U.S. controlled contract let to the Korean commercial sector (Corcoran, 1991). The United States argues a contract with the Korean commercial sector will provide the flexibility and responsiveness which we need, where the Korean governmental contract with their military would not. This issue has become a big concern for the United States Forces

in Korea because if we cannot get supplies between the bases, there will be a lot of pressure on the U.S. Air Force transportation community to provide the line haul service (Corcoran, 1991).

V. Conclusions and Recommendations

Introduction

The conclusions and recommendations that are contained in this chapter are based on the researcher's literature review and the interviews summarized in Chapter IV.

Conclusions

The primary conclusions the author attained from this research were that burden-sharing is necessary for today's U.S. military forces due to budgetary constraints, and it is favored by senior logisticians within the Department of Defense as a sensible means to achieve the United States' national security objectives. Although drawbacks of burden-sharing were cited and areas of concern were noted, the pros of burden-sharing far outweigh the cons.

Vehicles are a natural for burden-sharing programs by providing latitude in the bilateral negotiations. As agreements fail to materialize and initiatives fall out of the burden-sharing negotiations because of often more sensitive political, military, or economic disagreements, vehicles can easily fill the void of the offset. Sharing vehicles is a natural in those countries that have the vehicle production capabilities. This fittingly compliments the United States' force and defense budget reductions.

The first step toward a successful vehicle burden-sharing program is the accurate and comprehensive

specification of requirements. This may include vehicle type and quantity, receiving location, timing, and acceptance conditions. The two negotiating countries must come to a mutual agreement on each requirement even if it requires providing pictures or drawings to aid in the illustration. This is of particular importance with special purpose vehicles. The host nation will generally provide what you ask for, as they interpret the requirement. In determining the requirements, the functional area users must be involved because what transportation requirements negotiators consider suitable substitutes does not necessarily mean it is a suitable substitute in the users' mind.

Concern was also expressed over the lesser degree of control over inventory, accountability, and status the Air Force would have with the vehicle assets owned by the host nation. However, this concern was offset by the intensity in which the South Koreans practice war and is indicative of their seriousness. So while the United States is reluctant in deliberate planning to count on the assets to be in place at the required times, the U.S. must remember we are in their country to aid in their self defense and that their assets will be made available for our use. The United States needs to understand these limitations exist and adjust accordingly.

It was believed the supportability of the Korean made, shared vehicles would be superior to the present

supportability situation with U.S. manufactured vehicles in South Korea. The ability for vehicle mechanics to order parts locally was said to be the biggest factor in the success for supportability. However, this issue became undetermined if the shared vehicles were to be deployed outside of the support channels of the Korean peninsula. In deploying Korean-made, shared vehicles out of country, the Air Force would add another resupply pipeline to an already critical area. Furthermore, the mixing of vehicles at remote contingency locations was felt to present problems for supportability, maintenance, and interoperability.

The biggest concern for the maintenance of shared vehicles was in fact parts availability. It was widely accepted that if the vehicle mechanics had a ready access to vehicle parts, maintenance would not be a concern. This is particularly true for the general purpose vehicles mentioned in this study.

A final concern expressed was that of reduced in-country line haul capabilities. The U.S. Army's 69th Transportation Battalion withdrawal from South Korea this next year will result in no organic line haul capability. As a result the requirement will have to be contracted out to a Korean interest. Flexibility and responsiveness of the line haulers are the key issues as the United States negotiates this agreement. As a result, there will be a lot of pressure put upon the U.S. Air Force transportation

community to provide the line haul capability when the need arises.

Recommendations

With the critical first step of the burden-sharing negotiation beginning with accurate and complete specifications, the transportation negotiators must be prepared to ask for exactly what the Air Force requires particularly for the complex vehicles. As Air Force requirements change, however, the negotiators must be given the flexibility and latitude to amend the bilateral agreement as necessary. The advice and recommendations from the functional area vehicle users cannot be over emphasized. Their input must be an integral part of the negotiation from the onset.

A second recommendation concerns the issue of U.S. control of the shared vehicles. The U.S. Air Force planning community must ensure our needs are known and have the ability to integrate the Korean vehicle assets into our fleet during the transition from peacetime into wartime. This will entail detailed plans and practice in order to train the final vehicle managers and end-users on the procedures and time-line of the operation. These plans must include the specific vehicles, their condition for acceptance, their location for transfer to the Air Force, and the timing of the transfer. Without this knowledge, the receiving personnel cannot effectively monitor the

inventory, accountability, and status and as a result will not be able to identify whom to ultimately give the vehicles to. After all, the theater commander must be afforded the visibility on the arriving vehicle assets from the host nation as well as deploying forces coming from the CONUS so he can match forces and equipment accurately.

On the other hand, the burden-sharing negotiators must insist the Korean Government maintain an equally detailed set of procedures so they can execute their side of the agreement in an orderly flow, one that matches ours. With these planning functions formalized, the control issue would be minimized and the United States will feel reasonably assured the South Korean governmen. will uphold their end of the negotiation.

A third recommendation is that perhaps a second burden-sharing agreement or contract should be formalized to provide for the execution and testing of the wartime host nation support strategy. Command post and paper work exercises will not be sufficient to test all the facets of the vehicle burden-sharing program. Selective testing is recommended on an as-needed basis so that the entire program can be verified and to provide training for both country's forces. Without this formalized training, we are only asking for confusion and mistakes to occur when actual implementation is executed.

A forth recommendation involves the deployment of the Korean-made, shared vehicles out of South Korea. If the

situation develops so that the Air Forces must deploy these vehicles out of the country, then vehicle spare parts kits would help alleviate the perceived resupply problem. Successful spare parts kits were effectively used in Europe for just these reasons. With parts availability the biggest factor in vehicle maintenance, this concern will also be reduced.

Finally, as our organic line haul capabilities are curtailed next year and new, foreign sources are negotiated, it is recommended the U.S. maintain limited capability to offset anticipated shortfalls due to reduced flexibility and responsiveness of a contracted operation. In addition to providing supplementary support, it will provide in-country familiarization training and tractor-trailer for U.S. military personnel.

Recommendations for Further Research

Because burden-sharing is a relatively new concept and is evidently so vital to the future effectiveness of U.S. forces abroad, further research in several significant areas is recommended.

First, research could focus on developing MOUs between the South Korean government and the U.S. forces, specifically the U.S. Air Force, so that increased standardization of procedures and plans may be realized. This issue should attempt to decrease the variability that currently exists between both country's wartime host nation

support strategies. Ideally, the MOUs should be as detailed as possible.

Another area that merits research is that of technology transfer. As the U.S. increasingly depends more and more on its allies, the application of technological transfer to the host nation may allow increased U.S. benefits in return. For example, rather than the United States continue to purchase highly complex U.S. manufactured vehicles in the United States, the U.S. could transfer the technology and specifications to the host nation and have the ally build for and supply our needs. As a result, both countries would secure advantages.

Appendix A: Foreign Buy Verse U.S. Buy Cost Comparison

(Nichols, 1990:4-8)

U.S. Buy Cost Formula

Concept: This formula assesses the overall cost to own a vehicle throughout its programmed life expectancy. The formula is broken down in three parts and utilizes one year of accumulated vehicle historical data retrieved from the vehicle master records of OL-VIMS.

A B C

$$\left(\frac{TOTAL\ P}{LA}\right) + \left[\left(\frac{LM}{LA}\right) x \left(\frac{P\ CST + F\ CST + (LABOR\ HRS\ x\ 15.00)}{TOTAL\ MILES}\right)\right] = CT$$

D E

$$\left[\left(\frac{AIC}{8760}\right) x \left(8760\left(\frac{VOC\%}{100}\right)\right)\right] = LOC$$

$$(CT + LOC)\ x\ LA = CTO$$

The first equation calculates the cost to own and operate a vehicle for one year. The formula breakdown is as follows:

"A" - Calculates the average investment cost per year. TOTAL P (total price) represents the sum of the purchase price, shipping cost, plus CONUS and overseas handling costs. The total price is then divided by the life expectancy in age (LA) of the vehicle.

"B" - Projects the average miles traveled in one year, based on life expectancy age (LA) and life expectancy miles (LM). The life expectancy in miles is divided by the life expectancy in age.

"C" - Computes the O & M cost per mile to operate the vehicle. Labor cost computations use a standard wage rate ($15.00), avoiding civilian wage differences. P CST, represents the total parts costs to include contracting costs. F CST, represents total on and off base fuel costs.

CT - Represents the total cost per year to purchase, maintain, and operate the vehicle.

The second equation calculates Lost Opportunity Cost (LOC) associated with a vehicle when the asset is out of service.

"D" - This computation calculates a vehicle's cost to own per hour. The result represents the annual investment cost per year (AIC) divided by 8760 (the number of hours per year). Annual investment cost is calculated by adding purchase price, plus shipping cost, plus CONUS and overseas handling cost divided by life expectancy in years.

"E" - Calculates the average vehicle out-of-commission hours for one year.

LOC - Represents the lost opportunity cost associated with a vehicle's out of service time, by multiplying investment cost per hour, times annual out-of-commission hours.

The third equation computes the life time cost to own per year: cost to operate and maintain per year plus annual lost opportunity cost multiplied by life expectancy per year.

Foreign Buy Cost Formula

Concept: This formula assesses the overall cost to own a vehicle throughout a prorated life expectancy. The formula provides a method for comparison between U.S. verse foreign manufactured vehicles having different life expectancies. The formula is comprised of four parts. The formula utilizes one year of accumulated vehicle historical data retrieved from OL-VIMS vehicle master record.

A B C

$$\left(\frac{TOTAL\ P}{FLA}\right) + \left[\left(\frac{FLM}{FLA}\right) x \left(\frac{P\ CST + F\ CST + (LABOR\ HRS\ x\ 15.00)}{TOTAL\ MILES}\right)\right] = CT$$

D E

$$\left[\left(\frac{AIC}{8760}\right) x \left(8760\left(\frac{VOC\%}{100}\right)\right)\right] = LOC$$

F G

$$\left[FLA\left(\frac{USLA}{FLA}\right) x \left(\frac{USLM}{FLA}\right)\right] = PL$$

$$(CT + LOC)\ x\ PL = CTO$$

The first equation calculates the cost to own and operate a vehicle for one year. The formula breakdown is as follows:

"A" - Calculates the average investment per year. TOTAL P (total price) represents the sum of the purchase price and shipping cost. The total price is then divided by the foreign life expectancy of the vehicle (FLA).

"B" - Projects the average miles traveled in one year, based on foreign life expectancy age (FLA) and foreign life expectancy in miles (FLM). The life expectancy in miles is divided by the life expectancy in age.

"C" - Computes the operations and maintenance cost per mile to operate the vehicle. Labor cost computations use a standard wage rate ($15.00) to avoid civilian wage differences. P CST, represents the total parts costs to include contracting costs. F CST, represents total on and off base fuel costs.

CT - Represents the total cost per year to purchase, maintain, and operate the vehicle.

The second equation calculates lost opportunity cost (LOC) associated with a vehicle when the vehicle is out of service.

"D" - This computation represents a vehicle's cost to own per hour. This is computed based on annual investment cost per year (AIC) divided by 8760 (the number of hours per year). Annual investment cost is calculated by adding purchase price, plus shipping cost, divided by life expectancy in years.

"E" - Calculates the average vehicle out-of-commission hours for one year.

LOC - Represents the lost opportunity cost associated with a vehicle's out of service time. LOC is computed by multiplying investment cost per hour, times annual out-of-commission hours.

The third equation prorates the added life expectancy of a foreign-buy vehicle. This is necessary to afford a method of comparing U.S. manufactured vehicles of one life expectancy to foreign manufactured vehicles of other life expectancies.

"F" - Calculates a percentage factor for U.S. life expectancy in years with foreign life expectancy in years. If life expectancies are identical, no change will occur to the final figure.

"G" - Calculates a percentage factor for U.S. life expectancy in miles with foreign life expectancy in miles. If life expectancies are identical, no change will occur to the final figure.

PL - Represents a prorated life expectancy in years.

The final equation computes the life time to own per year: cost to operate and maintain per year plus annual lost opportunity cost multiplied by projected life expectancy per year.

NOTE: This figure does not represent a true cost to own and operate a vehicle throughout its life time. Rather, it provides a method of comparing U.S. vehicles with foreign vehicles having different life expectancies.

Appendix B: List of Interviews

Lt Col Glen Cavin	Mobility Division Joint Chiefs of Staff/J-4 The Pentagon, Room 2D822 Washington DC 20330
Mr Frank Colson	Associate Deputy Assistant Secretary (Transportation and Federal Aviation) Office of SEC-USAF The Pentagon, Room 4E128 Washington DC 20330
Col Joe Corcoran	Chief, Programs and Agreements Branch HQ US Forces Korea/J-4 Yongsan AB, Korea
Maj Gary Gibbs	Vehicular Equipment Program HQ USAF/LGSP The Pentagon, Room 4A308 Washington DC 20330
CMSgt Philip Hodson	Vehicle and Equipment Division HQ USAF/LGTV The Pentagon, Room 4A320 Washington DC 20330
Mr Martin Isc[illegible]inger	Senior Operations Research Analyst - Pacific Region OSD - International Logistics The Pentagon, Room 2B329 Washington DC 20301
Lt Col Phil Jung	Chief, Vehicular Equipment Program HQ USAF/LGSP The Pentagon, Room 4A308 Washington DC 20330
Mr Wallace Knowles	Assistant for Korea OASD - International Security Affairs The Pentagon, Room 4C840 Washington DC 20301
Maj Jim Van Scotter	Vehicle and Equipment Division HQ PACAF/LGTV Hickam AFB, HI 96853

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Vita

Captain Harold E. (Hal) Frary was born in San Francisco CA on 12 October 1957. He attended Piner High School, University California Davis, and California Polytechnic State University - San Luis Obispo where he received his Bachelor of Science Degree in Animal Husbandry in 1981. Captain Frary joined the Air Force in 1985, graduating from Officer Training School and the Transportation Officer Course before being assigned to Dover Air Force Base DE. At Dover, he served as an Air Terminal Operations Duty Officer as well as Officer in Charge of the Air Freight Branch. In 1987, Captain Frary was assigned to Eielson Air Force Base AK where he served as the Chief of Vehicle Operations, the Traffic Management Officer, and the Chief of Transportation Combat Readiness and Resources Branch. Following his assignment in Alaska, Captain Frary entered the Air Force Institute of Technology in May, 1990. Upon graduation from AFIT, Captain Frary will be assigned to transportation staff, HQ Pacific Air Forces, Hickam Air Force Base HI. Captain Frary is married to the former Kathy Van Ruiten of Oakdale CA. The Frarys have two children: Corey, 7; and Sarah, 5.

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13. ABSTRACT *(Maximum 200 words)*

The purpose of this research was to examine the issues surrounding the U.S. Air Force vehicle burden-sharing initiative with South Korea. In doing this, the study examined additional vehicle programs with the South Korean government as well as with NATO alliances to provide an historical background and insight into the concerns that faced vehicle managers with those programs. In addition, several transportation experts throughout the Department of Defense were interviewed for their perspective of the vehicle management issues which relate to these programs. This research revealed several issues that continue to concern transportation experts. These areas include the accurate and comprehensive specification of the vehicle requirements, the reduced degree of U.S. control over shared vehicles, vehicle supportability and maintainability, and the curtailment of U.S. organic line haul capabilities within South Korea. The researcher's recommendations included the establishment of detailed procedures for both U.S. forces as well as the South Korean forces. Furthermore, the researcher proposes vehicle functional area experts be involved in the initial and subsequent vehicle requirements negotiations with the host nation; often transportation managers' ideas for a suitable substitute are not compatible with the users'.

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