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CASES IN LOGISTICS MANAGEMENT

The Maintenance Function

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(6) CASES IN LOGISTICS MANAGEMENT: THE MAINTENANCE FUNCTION,

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AIR FORCE INSTITUTE OF TECHNOLOGY
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Strength Through Knowledge

Preface

This document containing cases for study in the maintenance function of logistics management is but a part of a much more extensive documentation of not only cases but concepts in the entire spectrum of logistics--including the functions of requirements determination, acquisition, distribution, and maintenance. The entire volume, entitled Logistics Management: Cases and Concepts, is published by the School of Systems and Logistics as SLTR-1-71.

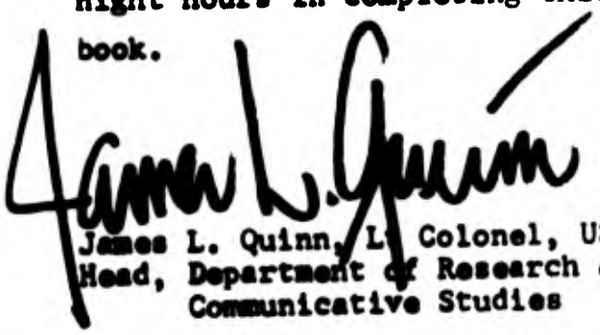
Separate documents containing cases applicable to specific functional areas are also published by the School under the following titles and identifying document numbers: Cases in Logistics Management: The Requirements Determination Function, SLTR-9-70; Cases in Logistics Management: The Acquisition Function, SLTR-10-70; Cases in Logistics Management: The Distribution Function, SLTR-11-70; and Cases in Logistics Management: The Maintenance Function, SLTR-12-70. These documents should be readily available for distribution through the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314.

I wish to express my personal appreciation to the many persons who made significant contributions in preparing the cases included in this document. One of the cases was initially prepared by a fellow member of the graduate faculty, Lt Colonel John F. Stanhagen, Jr. The other cases in this report were originally prepared by students in the Logistics Seminar course that I conducted in the School's Graduate Logistics Management Program. An aggregate listing of these contributors is presented in the appendix to this report.

A great deal of credit for the reorganization and editing of the student cases must go to Captains Gary A. Nelson and Edwin A. Wales, who provided valuable research assistance to me prior to their entry into the graduate program of the School. And, of course, the final reorganizing, rewriting, and editing of the cases was done by me.

I also gratefully thank Miss Ruth Alexander and Mrs. Kay Gessner, in the Department of Research and Communicative Studies, for their vital role in typing and proof-reading the material included herein.

Finally, my wife, Joy, deserves some inestimable amount of plaudits for tolerating my working many late night hours in completing this logistics management case book.



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LOGISTICS MANAGEMENT:
THE MAINTENANCE FUNCTION

Logistics has long been of prime importance to the conduct of war and the success of armies. Frederick the Great, in his Instructions for His Generals, said, "Without supplies no army is brave."[1] Indeed, in an extensive history of army logistics, The Sinews of War, James A. Huston states:

> Rarely in modern war has the side with logistical inferiority prevailed. However superior the generalship, or however brilliant the strategy and tactics, ultimate victory generally has gone to the side having the greater economic strength and thus the greater logistical potential.[2]

But perhaps the importance of logistics has never been so great as it is today with so large a proportion of our Federal budget being allocated to the military services and with so much of the defense budget, in turn, being consumed in expenditures for logistics and operational support functions.[3]

Thus the role of the logistics manager assumes significantly great importance in these crucial times when our nation is confronted with critical problems in many different areas -- domestic as well as foreign. With many socio-economic demands increasingly pressing for attention today and requiring a larger share of the dollars historically allotted to the defense effort in years past, it is imperative that military executives effectively and efficiently manage the vast resources entrusted to them to meet our national objectives.

It is for these reasons that the terms -- management, logistics, and education -- have become vitally important within the dynamic and challenging environment of our

contemporary society. To facilitate understanding of the significant interrelationships of these terms, each will first be briefly discussed.

Management

Management has always been essential to the functioning of any purposeful organization. Early man, in joining with other primitives in tribal communes, needed some degree of managerial ability and organizational skills to survive the hostile environment of his times.[4]

Things have little changed today. Man and organization -- in order to function, to develop, and to endure in our comples modern society -- must depend to the utmost on all the theories, the concepts, the tools and techniques, and the applications of management to resolve the problems of today and to meet the challenges of tomorrow.

Many different and often difficult definitions of management have been offered over the years, but perhaps the easiest to comprehend is that, "Management is the function of getting things done through people."[5] Indeed, management might be looked upon as a simple equation, derived by one of the leading management theorists of our times, John F. Mee, in his award-winning book, Management Thought in a Dynamic Economy, "Management = Objective + Process + Human Effort."[6] First, there must be some target, goal, or desired result -- an established and accepted objective for achievement by group effort. Second, there must be some process, or ways and means, of reaching the goal -- a process based on logical and effective thinking for guidance to obtain the objective. Third, and perhaps most important, human effort must be utilized in the process -- human effort, facilitated by other resources, to accomplish the tasks necessary to achieve the desired objective.[7]

Logistics

Logistics, like management, has also been of great importance over the years but has perhaps been less widely understood that has been the function of management. For instance, Admiral Ernest J. King, of World War II fame, is alleged to have said to one of his staff officers in 1942, "I don't know what the hell this logistics is that Marshall is always talking about, but I want some of it."[8] On the other hand, a more precise understanding of logistics was held many years earlier by Antoine Henri Jomini who stated, in his Precis de l'Art de la Guerre, in 1838, "Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics brings the troops to this point."[9] This view was subsequently reinforced by Lieutenant Colonel George C. Thorpe of the U.S. Marine Corps, during World War I: "Strategy and tactics provide the scheme for the conduct of military operations, logistics provides the means therefor."[10]

Indeed, within the past few years, there have been many various and sophisticated concepts of logistics proposed by different theorists and practitioneers, but the fundamental view offered by Admiral Henry E. Eccles, in his Logistics in the National Defense, is probably the most universally accepted: "In military terms, it [logistics] is the creation and sustained support of combat forces and weapons,"[11] which was subsequently restated, in his Military Concepts and Philosophy, as: "Logistics is the creation and sustained support of weapons and forces to be tactically employed to attain strategic objectives."[12]

Or, as various others have put it, "The principal concern of logistics is to get the right amount of the right thing to the right place at the right time -- and at right price."[13] The latter requirement is especially

important in today's environment of stringent budgets and unwarrnated cost overruns. Cost effectiveness is the key-word.

Logistics Management

Management and logistics. Two different words, two separate concepts. But the two terms might be considered conjunctively as "Logistics Management." Indeed, the two terms go hand-in-hand; they are inseparable if we are to have effective and efficient management of the resources entrusted to us.

In defining management and logistics, it was said that management might be equated to an objective plus a process plus human effort and resources, and that logistics might be defined as the creation and sustained support of combat forces and weapons. Thus, logistics management might be operationally defined as, "The process by which human effort and facilitating resources are directed toward the objective of creating and supporting combat forces and weapons."[14]

Logistics Management: an objective, a process, and human effort and resources. Logistics managers, of course, are a key element in this equation, since they provide and guide the human effort that is the heart of logistics management. Their's is the task of assuring that the logistics systems succdssfully achieve the objective of creating and supporting our combat forces and weaponry.

Education

The foregoing discussions emphasize the importance of the process portion of the logistics management equation, since one of the most important and challenging tasks facing the military services today is that of training and educating logistics managers for their vital roles as

stewards of our national resources, responsible for the judicious handling of the vast assets entrusted to them for accomplishment of our national objectives.[15] Although much of the process of logistics management may be learned from experience on the job, the increasing complexities of modern management systems require a level of expertise that can rarely be built within the work setting itself. Thus, knowledge obtained through training and education must supplement and support skills gained through work and experience.[16]

Many agencies within the Department of Defense are offering training courses and providing educational programs in logistics management, or related functional areas.[17] Course material is normally presented by both lecture periods and seminar sessions. In the latter method of instruction, wide use of exercises and case studies has often been made.[18]

Case Approach

The case method of teaching is gaining increasing recognition as one of the more effective techniques for preparing decision-makers of the future. Many of the leading graduate schools of business have successfully employed the case method as the primary means of developing managerial skills and experience of their students.[19]

Case studies in logistics management can afford the student the opportunity to gain firsthand knowledge of an actual or realistic logistics situation. From this experience he should develop a better understanding of the environment surrounding the broad field of logistics and perhaps better appreciate the interrelationships of the various logistics functions.[20]

Unfortunately, there is a relative paucity of good cases presenting realistic logistics problems. Most cases

being used in various logistics schools throughout the services appear to be more concerned with human or organizational problems in a logistics setting rather than logistics problems in a human or organizational setting. Since so very few cases have been found to have the latter focus, a number of cases have been developed by James L. Quinn, a member of the graduate faculty of the Air Force's School of Systems and Logistics, and the students in a logistics seminar he conducted in the School's Graduate Logistics Management Program.[21]

Most of these cases were based upon actual experience of these highly capable graduate students, ranging in rank up to Colonel or equivalent civilian grade and representing all the military services of the United States, as well as some of our foreign allies. Thus, the cases present realistic, although disguised, logistics problems that can provide valuable learning experiences for future students of logistics management.[22]

Case Format

Although no standardized format was initially stipulated for preparation of the cases, they were subsequently revised and subdivided into separate sections for instructional purposes.[23] Each case consists of the following sections: Situation, Direction, Analysis, Solution, Guide, and, when applicable, Bibliography. Generally, the Situation and Direction sections of the case are intended for use by the student; and the remaining sections are to be used by the instructor administering the case.

The Situation normally describes the background information and provides as much quantitative data as may be available about the logistics problem involved in the case. The Direction provides the student with specific instructions as to what he must do in analyzing the case and

recommending a course of action. The Analysis, primarily intended for guidance of the instructor, provides a statement of the problem, a description of pertinent facts, a listing of assumptions made, and a discussion of alternative courses of action that might be taken. The Solution may be but one of many which could have been made. In some instances, it may be the one actually made in the real situation upon which the case is based; in other cases, it may be the recommended solution which is shaped by the particular assumptions made in the Analysis. The Guide provides the instructor with some guidance as to how the case might be administered, i.e., how many class periods might be needed, what duration they should be, whether individualoor team effort should be used, or whatever. The Bibliography, when applicable, provides sources from which data were gathered in developing the case or from which further information might be obtained if needed.

Functional Classification

The cases developed by Professor Quinn and his students were subsequently categorized into the four major functional areas of logistics described in Air Force Manual 400-2, Air Force Logistics Doctrine.[24] Although any number of alternative classifications might have been employed, the decision was made to accept the basic categories provided by offcial doctrine -- Requirements Determination, Acquisition, Distribution, and Maintenance.[25]

The Requirements Determination function identifies the resources needed to accomplish assigned missions; the Acquisition function is concerned with obtaining that which is needed; the Distribution function is concerned with providing that which is needed to those who need it; and the Maintenance function is concerned with the continued support of that which has been acquired and distributed.[26]

The Maintenance Function

This particular set of case studies is concerned with the Maintenance function of logistics management. Other documents in this series of reports contain cases in the related functional areas: SLTR-9-70, Cases in Logistics Management: The Requirements Determination Function; SLTR-10-70, Cases in Logistics Management: The Acquisition Function; and SLTR-11-70, Cases in Logistics Management: The Distribution Function. A more extensive documentation of not only cases but concepts in the entire spectrum of logistics, including all four functional areas, is published as SLTR-1-71, Logistics Management: Cases and Concepts.

Since the classification of functional areas contained in the Air Force Logistics Doctrine is followed in categorizing these cases in logistics management, the following excerpts from AFM 400-2 have been selected to describe the Maintenance function:[27]

> a. Maintenance includes all actions taken to retain materiel in a serviceable condition or to restore it to serviceability. It includes inspections, testing, servicing, classification as to serviceability, repair, modification and reclamation. Maintenance is dependent upon the optimum blending and utilization of supply, transportation, training and available maintenance resources. Maintenance concepts must be tailored to the operational concepts for the employment of the weapons systems and specific mission of each major command. These concepts are tailored to meet the military objectives directed by national policy.
>
> b. Air Force maintenance must provide maximum equipment readiness/availability. In addition:
>
> (1) Maintenance must be planned and accomplished to assure optimum effectiveness of each weapons system.
>
> (2) Every effort must be made to reduce life-cycle maintenance costs.
>
> (3) Maintenance concepts must be developed for each new weapons system in parallel with design

(reliability, maintainability, etc.) to insure full maintenance benefits during the system's operational use.

(4) Air Force maintenance systems and concepts must be responsive to changing operational requirements.

c. Maintenance is categorized into two general groups: base level and depot level maintenance support. Base level maintenance support is accomplished while the materiel remains under the custodyoof the using command. Once maintenance is accomplished on the materiel, it is returned to service. Depot level maintenance support is accomplished after the withdrawal of the materiel from the custody of the using command. Once maintenance has been completed on the materiel, it is returned to stock for reissue or returned to the user.

d. Base level support is usually accomplished through a military (organic) capability by personnel assigned to the using command. There are conditions, however, when this level of maintenance is performed through a contractual arrangement.

e. Depot levelmmaintenance is performed at an Air Materiel Area (AMA) facility or through a contractual arrangement.

f. Both sources of maintenance, military and contract, serve important objectives. Military maintenance provides a commander with close control and assures a capability for sustained operations under all conditions. Contract maintenance provides a means for augmenting the military capability and may be more efficient from a dollar cost consideration. In addition contract maintenance can:

(1) Release military maintenance capability and capacity for more essential work.

(2) Reduce requirement for investment in facilities, equipment and training of personnel.

(3) Provide a cushion of flexibility to maintenance programs.

(4) Increase the dispersal of maintenance capability.

(5) Result in net benefits to the government without compromising vital military mission responsibilities.

g. Maintenance management bears a heavy burden in developing systems that insure operational effectiveness. Development of control systems such as the system in AFM 66-1 requires review of current processes to determine the changes required to conform to new technologies.

h. Part of the maintenance management function is the responsibility to coordinate training requirements so that each type of maintenance unit possesses the skill and mix to support its mission. The creation and updating of technical manuals and data is companion to efficient maintenance and training (formal and on-the-job).

Briefs of Cases

The following is a listing and brief description of the cases included in this document relating to the Maintenance Function:

Case M: Overhaul Free-For-All.-- The buildup of our forces in Southeast Asia was accomplished in record time. However, the short leadtime imposed by this unanticipated buildup had serious consequences for certain logistics elements. This case illustrates some of the problems associated with the increased maintenance requirements on our jet engines.

Case H: C-XX IRAN Case Study.-- Logistics decisions never operate in a vacuum; their implications are felt in many directions. In selecting an IRAN contractor, special considerations must be given to these implications -- especially if a foreign government is involved. In addition, one must not lose sight of the primary function of IRAN. The distribution function will also be discussed in this study.

Case K: Rapid Deployment of Non-Combat Ready Aircraft.-- Long range planning often cannot include all possible contingencies. Prior commitments may limit the availability of resources to be used in any individual situation. In this case, the deployment of three squadrons of non-combat ready aircraft to an overseas base will be considered. In addition to the maintenance function, consideration should also be given to the distribution function of logistics.

Case L: Operation Fantasia.-- The deployment of our weapons systems is important to our defense posture. These operations provide the logistics planner with a multitude of problems, many of them in the area of maintenance. This case will acquaint you with some of the variables which must be considered in an actual deployment. Thus the distribution function will also be considered in this study.

Although the cases in this document are very much concerned with the Maintenance function, Cases K and L may also be used for study of the Distribution function of logistics management and Case H for study of the Acquisition function. Cases M, H, K, and L are presented in the standardized format described under the section on Case Format. Case Z, however, is not in the standard format but is presented exactly as compiled by the originator of the case, Lt Colonel John F. Stanhagen, Jr., a fellow professor in the School of Systems and Logistics. All other cases were originally prepared by graduate students[28] in Lt Colonel James L. Quinn's logistics seminar and were subsequently edited and revised by Lt Colonel Quinn and his graduate assistants, Captains Gary A. Nelson and Edwin A. Wales.

FOOTNOTES

[1]Frederick the Great, Instructions For His Generals (1717), p. ii, quoted in Robert Debs Heinl, Jr., Colonel (Ret), USMC, Dictionary of Military and Naval Quotations (Annapolis, Md.: United States Naval Institute, 1966), p. 315.

[2]James A. Huston, The Sinews of War: Army Logistics, 1775 - 1953. Army Historical Series, Office of the Chief of Military History, United States Army (Washington, 1966), p. 159. Although Huston's statement was quoted from the chapter specifically addressed to the organization for logistics in the Civil War, it has general applicability to all wars throughout history.

[3]Analysis of any contemporary Federal budget will reveal the large proportion of funds allocated for military and logistics expenditures; see, for instance, The Budget of the United States Government for Fiscal Year Ending June 30, 1970 (Washington: U.S. Government Printing Office, 1969), or any other recent year.

[4]James L. Quinn, The History and Development of Management Thought and Philosophy (1965), p. 5. This comprehensive document, a controlled distribution book used in the Graduate Logistics Management Program at the Air Force's School of Systems and Logistics, Wright-Patterson AFB, Ohio, is presently being revised for publication as SLTR 2-71, which should soon be available from the Defense Documentation Center, Alexandria, Virginia.

[5]Although this simple definition of management has often been used by many management theorists and practitioneers, the original source is unknown to the author.

[6]John F. Mee, Management Thought in a Dynamic Economy. (New York: New York University Press, 1963), p. 9. Dr. Mee, The Mead Johnson Professor of Management at Indiana University, is renowned for his contributions to management thought and philosophy. A past president of the Academy of Management, he has written innumerable articles and papers on the broad subject of management and its applications, and his small book, cited above, is a compilation of a distinguished series of guest lectures presented at New York University.

[7]Mee, p. 9.

[8]Ernest J. King, Admiral, USN, quoted by Robert Debs Heinl, Jr., Colonel (Ret), USMC, Dictionary of Military and Naval Quotations (Annapolis, Md.: United States Naval Institute, 1966), p. 175.

[9]Antoine Henri Jomini, quoted by Robert Debs Heinl, Jr., Dictionary of Military and Naval Quotations (Annapolis, Md.: United States Naval Institute, 1966), p. 175.

[10]George C. Thorpe, Pure Logistics: The Science of War Preparation (Kansas City, Mo.: Franklin Hudson Publishing Company, 1917), p. 9; quoted in Henry E. Eccles, Military Concepts and Philosophy (New Brunswick, N.J.: Rutgers University Press, 1965), p. 49.

[11]Henry E. Eccles, Rear Admiral (Ret), USN, Logistics in the National Defense (Harrisburg, Pa.: The Stackpole Company, 1959), p. 21; also see pp. 19 & 315 for restatements of the basic definition. Admiral Eccles, who has had many years' experience in logistics planning and operations, is widely viewed as one of the most foremost contemporary authorities on the subject of logistics.

[12]Henry E. Eccles, Rear Admiral (Ret), USN, Military Concepts and Philosophy (New Brunswick, N.J.: Rutgers University Press, 1965), p. 70.

[13]This description of logistics has often been used in various forms by logistics authors. Although the original source of the statement is unknown, the derivation of the definition is sometimes attributed to the much earlier statement by General Nathan Bedford Forrest (1821 - 1877) who said, "I always make it a rule to get there first with the most men," widely misquoted as, "I git thar fustest with the mostest men," cited by Robert Debs Heinl, Jr., Colonel (Ret), USMC, Dictionary of Military and Naval Quotations (Annapolis, Md.: United States Naval Institute, 1966), p. 63.

[14]This definition of logistics management is, of course, derived by simply combining the separate definitions previously used for management and for logistics. Perhaps a more sophisticated definition of logistics management is that advanced by Fred Gluck, formerly Head of the Department of Management Studies in the graduate program of the School of Systems and Logistics, and compiler of the comprehensive report, A Compendium of Authenticated Logistics Terms and Definitions, SLTR-5-70, School of Systems and Logistics (January 1970). In a letter to Headquarters, United States Air Force (AFSLPPP),

1 November 1968, commenting upon the final draft copy of AF Manual 400-2, Air Force Logistics Doctrine, LtCol Gluck offered the following definition: "Military logistics is that management system which allocates and utilizes the resources necessary to create and maintain the total capability required by a given strategy."

[15]This theme was further expanded upon in a recent address by General Jack G. Merrill, Commander, Air Force Logistics Command, on 20 August 1970, to the graduating class from the School of Systems and Logistics' Graduate Logistics Management Program. General Merrill specifically said, "As stewards of the resources entrusted to us we have developed a logistics system that, in most cases, enables us to buy more defense per dollar than at any time in our history. . . . but at the same time, we must be constantly on guard to insure that we handle the resources entrusted to us in the most judicious manner."

[16]The relationships between management, logistics, and education were the subject of an address delivered in 1970 by Lieutenant Colonel James L. Quinn, Head, Department of Research and Communicative Studies, of the Graduate Education Division of the School of Systems and Logistics, to the students graduating from several courses in the School's Continuing Education Division. The education of logistics managers was also the topic of a report by LtCol Quinn, The Logistician Progression Model, SLTR 6-70 (Wright-Patterson AFB, Ohio: School of Systems and Logistics, November 1970), available from the Defense Documentation Center, Alexandria, Virginia.

[17]Several of the leading schools offering courses in logistics management or related topics include the U.S. Army's Logistics Management Center (Fort Lee, Virginia), Management Engineering Training Agency (Rock Island, Illinois), and Transport School (Fort Eustis, Virginia); the U.S. Navy's Post Graduate School (Monterey, California), Transportation Management School (Oakland, California), and Headquarters Naval Material Command (Washington, D.C.); and, of course, the U.S. Air Force's School of Systems and Logistics (Wright-Patterson AFB, Ohio). Many of the more widely recognized courses offered by these schools are included in the Society of Logistics Engineers' Certificate Program for Professional Designation of DOD Logistics Managers (National Education Committee, SOLE International Headquarters, 1411 West Olympic Blvd., Los Angeles, California 90015). For further information on schools, course descriptions, and application procedures, reference should be made to DOD Catalog 50 10.16C.

[18]Both the Army's Logistics Management Center and the Air Force's School of Systems and Logistics extensively use exercises and case studies to enhance the learning process in their course offerings in logistics management. In the latter School's Continuing Education Division, extremely wide use has been made of exercises such as LOG-MAN-X, SUP-MAN-X, and similar simulation programs developed by personnel within the school under the supervison of Joseph B. May, Wing Commander (Ret), RAF. In the School's Graduate Education Division, extensive use has been made of case studies by both James L. Quinn, Lieutenant Colonel, USAF, in the Advanced Management Course and the Logistics Planning Seminar, and by John B. Camealy, Lieutenant Colonel, USAF, in these two courses as well as the Human Resources Seminar. LtCol Quinn's experience in the administration and development of cases in logistics management has lead to the publication of this casebook relating to military logistics problems. Similarly, LtCol Camealy is in the process of developing a casebook relating to logistics problems in the civilian setting. An ultimate objective is the combining of these collateral efforts, culminating in a book of concepts and cases relating to the total logistics environment.

[19]One of the most widely known proponents of the case method of instruction is the Harvard Business School, which has successfully employed this means of teaching for many years. Comprehensive collections of papers from advocates of the case method may be found in the two following books: Kenneth R. Andrews (ed.), The Case Method of Teaching Human Relations and Administration (Cambridge, Mass.: Harvard University Press, 1953); and Malcolm P. McNair (ed.), The Case Method at the Harvard Business School: Papers by Present and Past Members of the Faculty and Staff (New York: McGraw-Hill Book Company, Inc., 1954).

[20]Quoted from the syllabus of Lieutenant Colonel James L. Quinn's graduate seminar in logistics management, Logistics Planning (MS 5.41), 31 March 1969 - 13 June 1969, Graduate Logistics Management Program, School of Systems and Logistics, Wright-Patterson AFB, Ohio.

[21]Quinn, Logistics Planning, (MS 5.41).

[22]The broad and extensive experience from the widely divergent backgrounds represented by many of the graduate students in Lieutenant Colonel James L. Quinn's seminar provided an excellent foundation upon which could be

built the many varied cases presented in this series of documents concerned with logistics management. This diversity should be highly beneficial to future students in that any one of several different cases from a given functional area may be slected for study and analysis.

[23] Although this standardized approach to revising the cases may bring with it some of the criticism levied against "prepared problem cases" [cited by Harriet O. Ronken, "What One Student Learned," in Kenneth R. Andrew's The Case Method of Teaching Human Relations and Administration (Cambridge, Mass.: Harvard University Press, 1953), pp. 621-22], the development of separate subsections should be of valuable assistance to the instructor who has not had a great deal of experience in administering case studies for instructional purposes.

[24] "Functional Organizational Arrangement," Chapter 4, Logistics: Air Force Logistics Doctrine, AF Manual 400-2 (1 November 1968), pp. 4-1 - 4-7.

[25] Of these four functional areas delineated by AFM 400-2, the latter -- Maintenance -- is often omitted by many writers in the logistics area. For example, Admiral Eccles, in both his books, Logistics in the National Defense (Harrisburg, Pa.: The Stackpole Company, 1959), and Military Concepts and Philosophy (New Brunswick, N.J.: Rutgers University Press, 1965), cites only three fundamental elements in logistics -- Requirements Determination, Procurement, and Distribution [see pages 46 and 73, respectively].

[26] Logistics Doctrine, AFM 400-2, p. 4-1.

[27] Logistics Doctrine, Chapter 4.

[28] An aggregate listing of the contributors to the cases in logistics management contained in this document is provided in the Appendix. In that the majority of these cases were originally prepared by students in a graduate seminar in logistics, the following release was obtained from the students:

STATEMENT RELATING TO CASE STUDY
PREPARED/PRESENTED AS PARTIAL REQUIREMENT
OF THE LOGISTICS PLANNING COURSE

The case study prepared by the undersigned individuals and presented as a partial requirement of the Logistics Planning Course conducted by LtCol James L. Quinn of the School of Systems and Logistics is intended soley to serve

educational purposes. None of the information or material included in the case is intended to be derogatory to any individual or branch of the military services; rather the purpose of the study is to present either a real or hypothetical problem or situation that may be studied and analyzed within an educational context so as to provide the student with a vehicle facilitating the learning process.

None of the material or information contained in the case study is of a classified/security nature nor does it necessarily reflect the views of the School of Systems and Logistics, the Air Force Institute of Technology, the Air University, the United States Air Force, the Department of the Air Force, or any element of the Department of Defense. The entire case or any portions thereof may be reproduced for subsequent use within the School of Systems and Logistics or any other governmental schools, and the case may be edited as required for possible publication in either governmental reports/documents and/or professional journals/periodicals. In either case, it is understood that appropriate credit will be given to the undersigned individuals for their efforts in preparing the case study.

DATE:_____ CASE TITLE:_____

SIGNED:

_____

_____

However, at the specific request of some of the students who originally prepared the cases, their anonimity has been preserved insofar as authorship of a particular case is concerned. Even though these student-prepared cases have been substantially edited and revised from their original form and, in many instances, have been completely rewritten to further disguise the persons and/or circumstances involved in the case, many of the situations are based on actual events and reflect real problems and actions. Thus, the additonal precaution of using the aggregate credit listing has been taken to preclude the identification of a specific student with a particular situation or problem.

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"Functional Orgazational Arrangement," Chapter 4, in Logistics: Air Force Logistics Doctrine, AF Manual 400-2, Department of the Air Force, Washington, D.C., 1 Nov 68, pp. 4-1 - 4-7.

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APPENDIX

Aggregate Listing of Editors/Authors
of
Cases in the Maintenance Function
of
Logistics Management

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Academy of Management (Professional Management Society)
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Ramshorn Society (Honorary Engineering Fraternity)
Scabbard and Blade (National Honorary Military Fraternity)
Sigma Iota Epsilon (National Honorary Management Fraternity)
Society of American Military Engineers (Professional Engineering Society)
Society of Logistics Engineers (Professional Logistics Society)

CASE M

OVERHAUL FREE-FOR-ALL

BRIEF: The buildup of our forces in Southeast Asia was accomplished in record time. However, the short leadtime imposed by this unanticipated buildup had serious consequences for certain logistics elements. This case illustrates some of the problems associated with the increased maintenance requirements on our jet engines.

SITUATION

Logistics to you may be dull
Compared to doing spins or a stall
If so, I request
That you be blessed
To inherit a jet-engine overhaul

It was a crisp, sunny day in September 1966, as Major Jim Catastrophe sat leaning back in his chair, with his feet propped comfortably on his desk. He was gazing out the window of his office, dreaming of the upcoming hunting season. Off in the distance he could see the aspens beginning to yellow the slopes where that trophy elk awaited him.

"Sir!" The intercom brought him suddenly back to reality.

"Yes, Miss Witt, what is it?"

"Sir, the new DMM just called - said he wanted you in his office in five seconds, if not sooner."

"Hmm--wonder what he wants with me--he's only been here a week....Couldn't have worked his way down to the J-72 problem already. Better take my CYA file just in case though."

Major Catastrophe grabbed a folder out of the desk, stuck it on a clipboard and headed down the hall.

Colonel John Dunbar, the new Director of Materiel Management, greeted him warmly and asked him to have a seat.

"OK Major, how about giving me a quick rundown on this J-72 engine overhaul problem?"

"Yes sir, Colonel," Jim replied. "As you know, the J-72 is used in quite a few of the aircraft that we're using in SEA. It's a good reliable old workhorse and ordinarily doesn't give us much trouble. It's been in the inventory long enough that all the major "bugs" have been worked out, and about the only involved work on it is the 2000 hour major overhaul. However, with the buildup of our SEA forces in 1965, the demands for overhaul began to grow at a frantic rate. Not just because of the increased usage rate--but also because of the conditions, that we're operating under over there."

"I know that for a fact," interrupted the Colonel. "I just got back myself; and after seeing some of those runways and taxiways, its a wonder we have any engines left at all. That's without even considering the battle damage cases."

"That's true, we have had an awful lot come back with severe foreign object damage. But even at that,

we figured we could handle the situation with no sweat. When the demands started going up, we got together in February--we being the Specialized Repair Activity (SRA) director from St. Charles Air Materiel Area (SCAMA), a representative from Headquarters Air Force Logistics Command (AFLC), and myself. Incidentally, even though we have prime management responsibility for the J-72 here at STAMA, SCAMA is the prime SRA. We don't have the capability for jet engine overhaul here. Anyhow, we got together back in February of this year and decided that the best thing to do was get some contractor support cranked up. AFLC approved our proposal to contract out the overhaul on the J-72A and B models, leaving just the C model for SCAMA to work on."

"What percent of your total anticipated workload did the C model represent, Major?"

"Just about one third, sir."

"All right, go ahead with your story. How did the contracting go?"

"Well, sir, we had four different companies submit bids on the overhaul of 97, J-72A's and B's. All their bids were well under what we had estimated the cost would probably run, but rather than go through another cycle, we accepted them. Stovepipe Aircraft

won the contract with a low bid of 823 manhours and $4,895 per engine, for a total contract price of $882,000."

"Wait a minute, Major. What made you think that was an underbid? What did you base your estimate on?"

"I was just getting to that, sir. As you know, it's pretty hard to compare depot cost of overhaul as presently collected with the contractor's bid price. However, we do know how long it takes to get a J-72 through a repair line at SCAMA - 34.1 days to be exact. But Stovepipe based their manhour estimates on a 30 day flow time. Unless they could come up with some innovations that we hadn't thought of in ten years of experience, they were bound to exceed their manhour estimates."

"Had they ever done any overhaul work on the J-72?"

"No sir. In fact, Stovepipe is primarily an airframe manufacturer and their only experience with the J-72 was installing it in one of the aircraft they built back in '52. However, they had a lot of idle plant capacity and were pretty hungry for a contract."

"By the way, how come you only got a contract on 97 engines? Surely you were expecting more demand than that?"

"Oh yes, sir, but we were pretty much in a hurry to get things rolling. The pile-up at SCAMA was getting more chaotic every day, and we were getting so short on good engines we had to start robbing support from the stateside outfits to keep up with the hot war."

"So?--What's that got to do with getting such a small contract?"

"We figured a 97 engine contract would run us pretty close to the one million dollar mark, and we didn't want to get all tied up on the approvals it would take if we went over that magic amount. We guessed that our eventual requirement would run about 300 units a month, but it takes a long time to get a contract of that magnitude through the mill."

"OK. So you got the contract through in a hurry. I'm almost afraid to ask, but then what happened?"

"Parts shortages, that's what. All of a sudden we couldn't find enough engine parts to keep two repair facilities going. This was especially true with the recoverable assemblies installed on the engine."

"Surely the item managers for these reparables were aware of the increased demands they were going to have to cover?"

"Yes sir, but for some reason there just didn't seem to be enough to go around. Stovepipe kept rejecting a lot of the serviceables that we shipped, and they were pretty slow in returning unserviceables, but that by itself, shouldn't have caused the shortages we ran into."

"Doesn't sound like too big a problem to me, Major. Regardless of what caused the problem, all you have to do is get those item managers off their duff, and get some more assets cranked into the system."

"Oh, they're already working on that sir, but the response time on something like that isn't exactly overnight. Plus that's not quite all . . . or for that matter the biggest . . ."

The Colonel's left eyebrow began to creep upward, as he leaned closer over his desk. "You mean you've got more troubles?"

"Well . . . Well . . . I . . . I'm not exactly sure, but out of some unknown percentage of engines overhauled by Stovepipe, three of them have already failed. Compared to what we're used to on the J-72, this is ridiculous. The AFPRO (Air Force Plant Representative Office) is pretty confident that it's just a fluke due to learning problems Stovepipe ran into on their earlier over-

hauls. Just in case, though, we pulled fourteen of their engines out of the field and sent them down to SCAMA for a teardown inspection."

"I hope, for your sake, those inspection reports come back negative. This could really turn into a bucket of worms if they're not doing the job right . . . Well, is there anything else hovering over you at this time?"

"No sir, that's just about it." Major Catastrophe began to relax a little, anticipating the approaching end of the conversation. He was just leaning forward in the chair when the call light on the intercom blinked on.

"Colonel Dunbar, Sir. I hate to interrupt, but there is an important call on line four for Major Catastrophe."

The Colonel picked up the receiver, punched the button and handed the phone to the Major.

"Hello. Who's calling please?"

"Yeah Bill. Glad to hear from you." Covering the receiver, he smiled bravely at the Colonel, and said, "It's Major Tabor from SCAMA with the teardown reports." Putting the phone back to his ear, he urged, "Go ahead, Bill. What's the word?" There's a long pause, Jim's

knuckles turn white, then his lips begin to quiver, "You're sure about that?. . . Yeah . . . Sure . . . OK . . . Well, thanks for calling. See you back in Vietnam."

Jim sheepishly hands the phone back to Colonel Dunbar.

"Well, son, out with it! How many of 'em?"

"All fourteen of them, sir. Every damn last one of 'em are bad! My gosh, what am I going to do now?"

The Colonel rose slowly from his chair, leaned forward with knuckles pressing on the desk top, clamped down on his cigar and bellowed, "I don't know, Major, but I do know this, you damn well better have some answers in the morning. And furthermore, that ain't all. Once you get this fire put out, I want you to sit down and analyze how in the hell you got into this mess in the first place!"

DIRECTION

You are Major Catastrophe

1. Develop a course of action to alleviate the present situation.

2. Identify the problem areas which created the present situation and recommend action to preclude future occurrences.

ANALYSIS - I

STATEMENT OF THE PROBLEM

1. What actions must be taken to correct the discrepancies in the maintenance of the J-72 engine.

2. Identify the problem areas which created this situation and make recommendations to preclude future occurrences.

PERTINENT FACTS

1. The present contractor, Stovepipe Aircraft, had no prior maintenance experience with the J-72 engine.

2. The contract was for only ninety-seven J-72 engines.

3. All fourteen engines pulled out of operation for the teardown inspection were faulty.

4. There was a definite parts shortage for the J-72 engine.

ASSUMPTIONS

1. Major Catastrophe is capable of initiating appropriate action to alleviate this problem.

2. Stovepipe Aircraft had released numerous J-72 engines back into operation, assuming they were properly overhauled.

3. The stateside units which utilize the J-72 engines cannot furnish additional engines without mission impairment.

4. The aircraft in SEA utilizing the J-72 engines are vital to the operations in the theater.

5. The present situation will impede our world-wide operations.

ALTERNATIVES

1. Major Catastrophe can do nothing and hope the situation will correct itself.

2. Major Catastrophe can initiate corrective action but decide not to examine the factors which caused this situation because it was a "fluke."

3. Major Catastrophe can take action to alleviate the present situation and examine the factors which caused this untenable situation.

NOTE: A more detailed analysis is presented in the next section, Analysis - II.

ANALYSIS - II

In analyzing this case, it is important to recognize the tactical situation involved. During the Fall of 1965, the Executive Department made the decision to substantially increase the commitment of U.S. combat forces in SEA. The actual buildup that resulted from this decision was accomplished in record time despite the fact that it was largely unanticipated. Logistics support for certain elements of the deployed forces suffered the consequences of the short leadtime, however. Many of the logistics problems occurring during the months that followed this buildup can be either directly or indirectly related to the speed and volume of combat force commitment.

Since such a situation is probably characteristic of any future U.S. involvements, the idea should not be belabored that effective logistics requires a specified amount of leadtime. Instead, concentration is focused on areas of this particular problem where improvements can be made in spite of the general lack of anticipation. The first part of the analysis is a suggested course of action that Major Catastrophe might take to get out of the precarious situation he is in. Next is a discussion

in sequence of the key problems that led up to the final untenable situation, including identification of the affecting variables and the available alternative courses of action.

"PUTTING OUT THE FIRE"

Major Catastrophe has three major tasks to accomplish to get himself out of the mess he is in. First, he must find out why the contractor is turning out improperly overhauled engines; second, he must take corrective action to insure that proper overhaul is provided; and third, he must remove defective engines from the field.

To find out the reasons, he must arrange for the dispatch of repair specialists from SCAMA to the contractor's plant. These specialists would identify the problem and determine if the contractor has the capability to correct it without an amendment to the contract. If it appears to be within the capability of the contractor, the specialists should remain at the plant to insure that the contractor actually does properly utilize his capability to correct the problem. If he does make the corrections, action should be taken to terminate the contract by default. A new contractor should then be sought, utilizing emergency provisions of the ASPR, to minimize delay.

After the decision has been made to stay with the present contractor or obtain a new one, inspectors should be provided at the contract facility to supervise in-pro-

cess overhauls, to prevent engines from being released to the field in improper condition. This is a very important requirement that was apparently overlooked by the Major in the past. The case description indicates that he was unsure what the causes of the failures in the past had been ("just some sort of fluke due to learning problems") and, in fact, was unsure what the percentages of failures had been. This indicates a very loose inspection program and a general lack of supervision of the contractor. The inspectors are especially essential since the contractor resource for overhaul has not been used for these engines in the past and a lot of "bugs" will need to be corrected.

To insure the safety of the crews, all of the remaining engines that have been overhauled by Stovepipe should be returned to SCAMA for teardown and inspection. Since this is likely to interfere with operations in SEA, engines in use in the CONUS may have to be sent to SEA until the inspections are completed and adequate contractor overhaul capability is established.

PROBLEM AREA NUMBER ONE

Restrictions Imposed By The Armed Services Procurement Regulation

A comprehensive contract was not let, due to restraints contained in the ASPR. These restraints inhibit responsive support by purchasing activities through delays in accomplishing the procurement actions. These delays are a result of these requirements.

(1) Report on all contracts over $1 million three working days prior to notification of contract award to the contractor.

(2) Approval by Hq AFLC prior to issuance of letter contracts in excess of $1 million.

(3) Protests by contractors before contract award, lodged with Hq USAF or higher authority, prevent award until final disposition of protests are made.

(4) All contracts obligating funds in excess of $10,000 must be sent to Staff Judge Advocate for legal review.

The constraints are good business under normal conditions. However, it lengthens the lead time and causes problems under emergency conditions. These requirements should be reviewed to identify tasks that can be eliminated, modified, or accomplished after the fact to improve

responsiveness in case of emergencies.

Some help could be generated by a speed up at the Air Materiel Area (AMA). The Air Force has a maintenance production acceleration program described in Air Force Regulation (AFR) 66-3, Industrial Readiness Program. The set up now is for this program to apply to aircraft and missiles, this could be extended to include engines and would give us faster overhaul under emergency conditions.

One problem that still remains, however, is the engines that have failed. AFLCR 23-42, Directorate of Maintenance Air Materiel Areas, spells out the provisions for acceptance inspections. It appears in this case the responsible people were remiss in this area. Tighter inspections would have given more reliability.

PROBLEM AREA NUMBER TWO

Contractual Underbidding

Did we in fact have a deliberate underbid in the case of Stovepipe Aircraft? This question cannot be answered without detailed study of the method used in developing their bid. Instead, we should look at some of the reasons for apparent underbidding.

First and foremost, the DoD system as used by Air Force is responsible for much of the "underbidding". AF is prohibited from providing the bidders with much of the data which would impact on the validity of the bid price. This may be good or bad. Surely, if the Invitation For Bid stated that we expected a time requirement of so many manhours and so many days repair time, this may have a negative effect on innovative bidding.

On the other hand, the company preparing the bid may submit a low bid for various reasons. Ignorance of the job (inferred in this case) may bear strongly on a low bid; however, the "Responsibility" determination should eliminate these bids. The "hungry" company may submit a low bid to permit them to cover their overhead. This situation, assuming other factors are controlled properly, is to the benefit to the Air Force in the short run.

The problem in this case does not appear to be contractual--it appears to be contract enforcement oriented. The incidence of unsatisfactory item acceptance must be laid on the Air Force--not the contractor.

How can we get more responsive bids? A complete review of the system is suggested. The use of firm fixed price contracts "hamstring" all parties. A system of

incentives should be considered for all contracts of this nature. The primary incentive not in existence at this time is the "sustained satisfactory performance" clause should be based on historical knowledge of item performance, mean time between failures, etc. Delayed payments of profit margin should be adjusted up or down based upon actual field performance of accepted items. Use of this clause may result in better contractor quality control. It should also tend to discourage marginal bidders from entering the negotiations.

PROBLEM AREA NUMBER THREE

Cost Estimating

Three actions are necessary to minimize the difficulty experienced in determining a responsive bidder:

1. Accurate Government estimates must be made available.

2. The Armed Services Procurement Regulations (ASPRs) must be modified to accommodate time compression of actions and relief from emphasis on cost effectiveness.

3. Available Government expertise must be used to determine the responsive bidder.

Accurate Government estimates should be made and included in the Contingency Plan for the prime AMA.

These estimates should then be updated annually with the plan to insure as current information as possible. Upon development of a contingency, the estimates can be quickly adjusted to include major changes in the cost base since the last update. The time required to perform the update would not, under normal circumstances, be any longer than the time industry requires for preparation of a bid.

Peacetime emphasis in contracting is placed, equally, on cost and delivery. This policy must be relaxed for contingencies. The weighted guidelines used to determine the responsive bidder must place more emphasis on experience and ability to meet the schedule than upon the estimate.

Government knowledge, or expertise, in the task being contracted must be considered in determining the most responsive bidder. Available cost estimates will provide a basis for competitive price determination while Government knowledge and experience in the task to be performed should be used to determine the degree of responsiveness.

PROBLEM AREA NUMBER FOUR

PARTS SUPPORT

Key Problem: Supply of reparable generated carcasses to two repair facilities instead of one.

Most Important Variables: (1) The number of recoverable assemblies required to support the engines scheduled on the two overhaul lines.

(2) The number of reparable carcasses available for input into the recoverable assemblies.

(3) Lead times to procure new engine in the event that the accessory overhaul line cannot produce enough to supply the engine overhaul lines.

(4) The point in time when the IMs were informed that they must support two engine overhaul lines rather than one.

(5) The safety stocks of each recoverable assembly on hand at the start of the emergency.

Alternatives which were available

Before the emergency. (IMs for Accessories)

(1) Safety stocks above those calculated to keep "normal" business going.

(2) Safety stocks to support only normal business.

At Start of Emergency and as New Development Occurs.

A. Engine IMs

(1) Inform all Accessory IMs of increasing requirements due to both ordinary use and support of a second engine overhaul line.

(2) Let the IMs take care of their own business.

B. Accessories IMs

(If they have been warned about increasing requirements)

(1) Determine total capacity of SRA on multi-shift basis.

(2) Determine total input of reparables to support that capacity.

(3) Determine best sources of contract accessory overhaul after first canvassing other AMAs for possible support.

(4) Remind all using activities to input reparables as early as possible.

(5) Contract with other AMAs or Industry for additional overhaul.

(6) Determine leadtime minimum for buying new replacement accessories.

(7) Obtain contract with Industry for additional new replacement accessories to help support overhaul engine line.

(8) Review condemned carcasses for possibility of an emergency engineering fix to permit use for a limited time.

(9) Review excess dispositions - does junk dealer still have some that are serviceable or can be made serviceable?

(10) Review all user stocks - can some be redistributed. (If they have not been warned and emergency already is critical)

(11) The same as above - but on a much less effective basis. The necessary lead time to correct the problem is gone and they are doomed to be out of parts for some period of time.

SOLUTION

Consideration of Alternatives

Before the emergency. If the safety stock is above that necessary to support normal business, it costs more - yet accessories cost much less than the complete engine they can cause to be out of commission. If the accessories IM is more concerned about keeping his cost down than supporting the overall Air Force Mission, he may be reluctant to keep accessories on hand for emergencies thereby adding to the problem when one develops.

At the Start of the Emergency. The engine IM cannot operate in a vacuum and expect all to go well. He must not only keep his supporting accessories IMs informed but also his own Requirements and Distribution people who manage engine accessories assigned to the Engine IM. Had he informed these people of the engine overhaul contract in time, the probability of supporting it as well as the regular line would have been increased.

Conclusions

(1) Safety stocks were probably at a minimum.

"All of a sudden we couldn't find enough engine parts . . ." Safety stocks would have supported the operation for some period of time.

(2) The D/MM hadn't emphasized nor understood the importance of communications between IMs; and the IMs hadn't practiced using them.

"Surely the item managers were aware of the increased demands they were going to have to cover?" and ". . . all you have to do is get those item managers off their duff . . ."

(3) The IMs hadn't been warned in time to take necessary action to avoid the emergency. . . . and get some more assets cranked into the system "Oh, they're already working on that, Sir, but the response time to something like that isn't exactly overnight . . ."

(4) The IMs weren't reminding the users to return reparable carcasses as soon as possible.

". . . they were pretty slow in returning reparables . . ."

(5) The IM possibly was not doing his job right at any time.

"But that by itself shouldn't have caused shortages like we ran into."

Recommendations

(1) Stress value of communications and early warnings to all concerned.

(2) Stress training of personnel in their own areas and in the effects which their actions have on other areas in the system.

(3) Remind IMs that while the goal to get the job done at the lowest possible cost is important, it should not be accomplished by "losing the war" in the process.

Summary

The analysis of "Overhaul Free-For-All" does not cover all of the problems that might be implied from the case as presented. However, by covering the areas of restrictions imposed by the Armed Services Procurement Regulation, contractural underbidding, cost estimating, and parts support, the most important areas were touched upon. None of the problems, specified or implied, is new nor unique with our involvement in SEA. They have occurred before and can happen again unless we learn from this recent history of a real logistic problem.

GUIDE

This case is best suited for team projects. To examine all the aspects of this case will require five class periods. The complexity of this case necessitates outside study and research. The following guidance is suggested:

1. Distribute the case at the end of a class period.

2. The next class period should be devoted to the discussion of the problems presented in this case. Distribute the directions and divide the class into teams.

3. The second, third, and fourth class periods should be devoted to working on the team solutions.

4. The fifth class period should be devoted to the discussion of the team solutions.

NOTE: This case is based on actual information extracted from unclassified portions of "Corona Harvest" documents. The people, organizations, places, and equipments are entirely fictitious. Any resemblance is purely coincidental. The problems encountered, however, are entirely real and actually did occur.

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CASE H

C-XX IRAN CASE STUDY

BRIEF: Logistics decisions never operate in a vacuum; their implications are felt in many directions. In selecting an IRAN contractor, special considerations must be given to these implications--especially if a foreign government is involved. In addition, one must not lose sight of the primary function of IRAN. The maintenance function will also be discussed in this study.

SITUATION

For the years preceding 19XX, all of the theater C-XX aircraft IRAN was accomplished on a dispersal basis. As many as seven contractors, scattered throughout the area, were involved in C-XX IRAN. These same contractors also performed maintenance of various magnitude on other theater resources. The dispersal was evolutionary as a result of the sporadic build-up of overseas aircraft inventories over the years. Many of these off-shore contracts dated back a number of years. The companies, over half of which were foreign owned, considered themselves as traditional partners with the U.S. Government. The partnerships had worked in the prior years to the mutual benefit of the allied nations and the United States.

As 19X1 approached, however, the USAF contracting agency responsible for the IRAN contracts decided that costs could be reduced and the quality of work improved if the number of contractors was reduced. As a step toward a solution, it was decided to lift the C-XX work from the several and various contractors and concentrate all the work in the hands of a single contractor. Through competitive bidding, a fixed price contract was

let to the lowest responsible bidder. The award went to the Witayou Airlines, a commercial flag carrier of the Republic of Gentia. Witayou Airlines was one of the contractors who had previously received contracts for the C-XX IRAN.

Witayou Airlines also performed, under contract, maintenance on five other types of theater aircraft. As a matter of fact, they handled 35% of the USAF contract maintenance for the theater. Witayou's performance on contracts was very good and provided the Air Force with a 30 day turn-a-round time. They were always on schedule. The quality of output was enhanced by the economics involved since maintenance manhour cost was as low as $2.00 per hour. In addition, the average aircraft turn-a-round time was 6000 hours. Many factors contributed to Witayou getting the contract. However, the contract was negotiated with Witayou Airlines on an annual basis.

During 19X1, the first year of Witayou's new C-XX IRAN contract, an apparently cost-effective and interesting alternative to contracting with Witayou Airlines resulted from a number of discussions between the U.S. military advisors and the Gentian Air Force. In essence,

it boiled down to a proposal by General Rahn Ahan, Commander-in-Chief of the Gentian Air Force, as follows:

The Gentian Air Force maintenance depot had excess capacity going to waste. As a result, skilled mechanics and technicians were not keeping current. What was worse, these mechanics were leaving the service to work for the commercial airlines. General Ahan asserted that his depot was capable of IRANing all of the theater C-XX's. He maintained that his people could do it cheaper than commercial contractors, and equally as well. He pointed out that if his depot could get the C-XX contract, the government of Gentia would bank the contract receipts in a U.S. bank and use the deposits for only U. S. purchases, thus alleviating U. S. gold flow problems. In this way, he asserted, the U. S. would get triple benefits: (1) they would be relieved of the MAP training expense involved in retraining new mechanics and technicians now losing currency or replacements for those leaving the system; (2) his depot could do the job cheaper; and (3) there would be a reversal in the gold flow.

Word of the General's proposal was relayed through channels and as a preliminary gesture, a team of U. S. technicians was sent out to evaluate the Gentian Air

Force Depot capabilities. The team report was favorable. The general's proposal gained momentum through his personal contacts in the USAF and CONUS. The MAP advisors endorsed the general's proposals. The intermediate commands in the CONUS responsible for negotiating the contract went to Headquarters Air Force for guidance.

Appendix to Situation

FACT SHEET

1. Normally, contracts such as the one let to Witayou Airlines, have a special provision which states, in effect, that the contractor can expect renewal of the existing contract if: (1) a continuing requirement exists, (2) if no increase in manhour expenditures is anticipated, (3) if time and performance standards have been met, and finally, (4) if controllable costs do not increase. This clause was part of other contracts with Witayou Airlines, but for some reason was omitted on the C-XX contract.

2. The Chief of Logistics of the Gentian Air Force has submitted a quasi-formal unsolicited proposal, which has been endorsed by the Gentian government.

3. The current contract with Witayou Airlines has an option clause which provides that the contract may be extended up to 90 days to insure that there will be no break in maintenance of aircraft.

4. There is some belief, reliably founded, that the Gentian Air Force cannot manage the stringent requirements of the Request For Proposal needed to enter competitively into the bidding process.

5. If the contract is awarded on the basis of open competition, there is no assurance that the Gentian Air Force's low bid will, in fact, be the lowest.

6. Cost accounting surveillance requirements might have to be waived, inasmuch as many of the records are internal to the Gentian government and U. S. contract administrators will not have the opportunity for detailed audit.

7. It may be necessary to let Witayou's contract terminate, and to "contract" with the Gentian government through an agreement process. (There is a precedence for "government-to-government commercial agreements" that have had the force of contracts.)

8. The question arises; If C-XX's are pulled from Witayou, will Witayou increase prices on the balance of other work to compensate for the loss?

9. It is estimated that the Gentian Air Force Depot manhour rate will be $1.90 per hour.

10. Flow time for the first 10 aircraft will probably be in excess of current flow time. The learning curve level-off point for 6000 hours required for 30 day turn-a-round is the tenth unit of production. The slope of the learning curve is 70%.

11. If we decide to pull the C-XX's from Witayou, we can possibly add to their 19X2 contract a proportionate number of F-XXX aircraft.

DIRECTION

You are in charge of the Air Staff Agency which must recommend a decision and provide guidance to the subordinate commands. The fact sheet, made up by your staff, is now in front of you. Moreover, you have just received a telephone call indicating that General Ahan has construed the preliminary talks and discussions as a U.S. committment.

ANALYSIS

STATEMENT OF THE PROBLEM

Should the Gentian Air Force or Witayou Airlines receive the contract for the C-XX IRAN?

PERTINENT FACTS

The pertinent facts are contained in the Appendix to the Situation.

ASSUMPTIONS

1. U. S. forces will remain in Gentia for the foreseeable future; therefore, the IRAN function on C-XX aircraft will need to be performed.

2. Friendly relations with Gentia are a necessity due to its strategic and tactical features.

3. Gold flow is a problem and efforts must be made to correct the outward flow.

4. Political factors will have an influence on the decision.

5. Witayou will not feel any adverse effects due to the loss of C-XX IRAN.

ALTERNATIVES

1. Permit the Gentian Air Force Depot to repair a limited number of C-XX aircraft and as they prove their capability, increase their share of C-XX repair until they become, gradually, sole source. This decision presupposes a close working coordination with both Witayou and the Gentian Air Force. Concern expressed in arriving at this solution evolves around a concern for over-optimism on the part of the Gentian Air Force.

2. Maintain the contract with Witayou. Do not give the contract to the Gentian Air Force. Consider, instead, giving another contract such as the F-XXX to the Gentian Air Force Depot. Concern expressed in this solution centers around the fear that the Gentian Air Force Depot would not accord proper priority to the C-XX contract. (i.e., Gentian Air Force aircraft first, C-XX after that) Concern is also expressed over the possibility of both the U. S. and Gentian governments being committed to a war as allies against a third power and the resultant probability of overtaxed capabilities at this sole source of IRAN. Furthermore, this solution considers the lack of the Gentian Air Force's RFP capability as unfair to the concept of competitive bidding. Other factors listed as affecting this solution are the possible lack of cost surveillance and a formal contract.

3. A third recommended solution envisions the Gentian Air Force getting both the C-XX and the F-XXX contracts. The reasons given are cost-effectiveness possibilities, especially, reduction of MAP training costs with the corresponding increase in the effectiveness of the Gentian Air Force work force. This solution offers the observation that Witayou was "fat" with U. S. business and would not "feel" the loss of the C-XX contract.

SOLUTION

As is frequently the case in this type of work, the data given is not sufficient to base a "one correct solution" upon. Therefore, the best solution will be determined by the assumptions that are made by the student. The analysis section of the case provided a number of alternatives that could be selected. If the student's solution was based on assumptions similar to those given for the various alternatives, then he has selected the most correct response.

In this case, the assumptions which were listed in the analysis section lend themselves to the selection of the first alternative as the more appropriate solution, i.e., permit the Gentian Air Force Depot to repair a limited number of C-XX's and gradually increase the number given to them as they prove their capability.

GUIDE

This case would be best utilized if active classroom discussions are employed. The basic learning objectives will be achieved if the students are provided an opportunity to develop meaningful and precise assumptions about the situation which are not given in the case itself. It is recommended that the situation and direction sections of the case be given to the students during one class period and that the students be prepared to discuss the case during the next class period.

Particular emphasis should be given to the discussion questions listed below in the discussion guide.

INSTRUCTOR NOTE

A number of possible solutions could have been made on this case. However, it is based on an actual occurrence in which the decision was made to award the contract to the "Gentian Air Force." At the time, there were many valid reasons for the decision. As it worked out, the "contract" with the Gentian Air Force did not prove to be any cheaper. In fact, it cost (slightly) more than previous arrangements and there was an initial increase in turn-a-round time. However,

by reallocating other aircraft to different contractors, overall savings were realized with a net increase in effectiveness.

DISCUSSION GUIDE

If there is one thing this case demonstrates, it is the fact that there is no "neat" quantitative solution. Any economically logical solution could be overridden by political exigencies. The case, as presented, also illustrates that despite best efforts, frequently, data supplied á decision-maker are inadequate. The fact sheet illustrates a hurried effort on the part of staff members. It also illustrates that perhaps the decision-maker did not adequately communicate his "need-to-know" requirements to his colleagues.

The student should have considered some of the following questions in his decision-making process:

1. How was the situation allowed to evolve to the point where the Gentian Government interpreted a committment on the part of the U.S.? Perhaps guidance to the logisticians in the field is necessary to discourage loose talk and negotiations with allies that put the U. S. under undue constraints.

2. Any decision made must take into consideration the discussions and opinions of agencies outside of the particular office of the Air Staff; for instance, the State Department, Air Staff political advisors, the Treasury Department, and Bureau of the Budget, and economic advisors on the Air Staff. The main idea is

that an obvious logistics problem relates to other sub-systems of the government.

3. Which factor with respect to U.S.-Gentian relationship was most important: logistics, economic, or political?

4. Considered from purely a cost-effective logistical viewpoint, was there that much cost differential between alternatives? (i.e., was the problem cost sensitive?)

5. Would the recommended action of the Gentian Air Force really affect the gold flow?

6. Were any logistical precedences possible? If so, would their long range implications be good or bad logistically? (i.e., the possibility of bringing other allied air forces into the arena of competitive bidding)

7. Should the MAP advisors be vigoriously pursuing this type of politically fraught course of action?

8. What impact on cost and turn-a-round time did learning curve data demonstrate?

9. Are logistic policies needed to coordinate the efforts of Military Assistance Advisors and U. S. Forces?

10. Did the Gentian Air Force over-estimate their capability to manage all the "ins-and-outs" of U.S. government paperwork? What would be the managerial consequencies of waiving paperwork requirements? Would control be lost?

CASE K

RAPID DEPLOYMENT OF

NON-COMBAT READY AIRCRAFT

BRIEF: Long range planning often cannot include all possible contingencies. Prior commitments may limit the availability of resources to be used in any individual situation. In this case, the deployment of three squadrons of non-combat ready aircraft to an overseas base will be considered. In addition to the distribution function which is the primary focus of this study, consideration should also be given to the maintenance function of logistics.

SITUATION

"What a great change of pace!" thought Captain Frank Jackson, as he leaned back in his chair at SMAMA and lit his corn cob pipe. Jackson had just graduated from the Logistics Management Program, and he was in his first duty assignment following completion of that 12-month grind. To top off a good assignment, Jackson had had the exceedingly good fortune to meet a beautiful blonde only last weekend, and they were going to spend the next weekend in Vegas. How great could things get?

Not being very busy, Jackson picked up the morning paper and noticed that the 'Cold War' was getting hotter in Korea. He thought to himself that he was fortunate to be in a plush slot on the West Coast, far away from the hot spot he was reading about. His thoughts suddenly were interrupted by the buzzing of his intercom. Answering the call, Jackson found his boss, Colonel Bull Shoot, the Director of Materiel Management, booming out a command, "Jackson, hurry up and come into my office! I've get a project that's going to keep you damned busy for awhile!"

As Frank walked down the hall, he wondered what the project might be. He was soon to find out.

As he entered Colonel Shoot's office, his boss said, "Sit down, Jackson. I know you've been loafing for the past 12 months in that soft student assignment. Now, I want you to start earning your money. Besides, I want to see if you've learned anything that can be put to use in the 'real' Air Force." Colonel Shoot shuffled some papers on his desk for a few moments, then looked up at Jackson and said, "I was in with the 'Old Man' for a couple hours this morning and we have a real big problem. First, Jackson, take a look at this intelligence report."

* * * * *

[SEE INTELLIGENCE REPORT]

* * * * *

"It sure doesn't look as if things are getting any better in that part of the world, does it?" Jackson commented as he finished reading the report. "But how does this have anything to do with us, Colonel?"

Colonel Shoot looked intently at Jackson, then leaned forward and spoke confidentially, "Jackson, you may not realize it, but our fighter resources are spread very thin due to the Southeast Asia involvement. We could be in a great deal of trouble if we don't get backup fighter support to Korea -- and fast!" Captain

Rapid Deployment of Non-Combat Ready Aircraft

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INTELLIGENCE REPORT

*General Situation in the Far East: Continuing deterioration and worsening of relationships between U.S. and Communist bloc countries.

*Korea
- *North Korea becoming overly aggressive. They have been encouraged by the recent destruction of the U.S. Navy EC-121 reconnaissance aircraft together with the killing of all 31 men aboard, and the earlier capture of the U.S. Navy ship Pueblo -- with U.S. doing virtually nothing about these aggressive and provocative actions.
- *Invasion of South Korea can come anytime now. In addition to the steadily increasing number of MIG-21s and bombers being supplied by the Soviet Union, the munitions plants and aircraft factories in North Korea have doubled their output in recent weeks. They have superior capability and war potential due to the fact that North Korea is rich in assets and possesses the needed electrical power and raw materials which South Korea does not have.
- *Anticipated invasion will be directed towards Seoul and perhaps simultaneously against other important military installations elsewhere.
- *U.S. aircraft on air defense alert in the vicinity of Seoul can repel the enemy threat for only 3 days in the event of an attack. All other facilities have been relocated further south near the tip of the Korean peninsula.

*Japan
- *Communist-lead labor unions and student organizations active around U.S. military and government facilities, especially in Japan and Okinawa.
- *Consider for instance:
  - *5,000 leftist students battled police in downtown Tokyo, demanding return of Okinawa to Japan and abolishment of U.S.-Japanese Security Treaty.
  - *Thousands of students rioted in Tokyo, encircling its colleges, governmental offices, and downtown business sections.

Rapid Deployment of Non-Combat Ready Aircraft

*Red China

*Lin Piao, Mao's successor, has called upon the Chinese to prepare for war with first, the United States; second, the Soviet Union, and/or both simultaneously.

* * * * * * * * * * * * * * * * * * *

Jackson whistled softly, and Colonel Shoot continued, "As a result, we are going to activate three squadrons of F-222s that are in storage here at SMAMA and fire them over to Seoul, ASAP. The really big hooker is that they must be combat ready when they get there. This is where you come in. I'm going to give you some background information that I had prepared on this matter. Now, Jackson, I want your recommendations on my desk Thursday morning, since we're going to brief the 'Old Man' on Friday morning as to what we should do." As the Colonel handed Jackson a brown envelope with the information inside, he looked closely at Jackson and asked, "Think you can handle it?"

Smiling confidently at his boss, Frank said, "I sure think I can, Colonel. I can apply some of that education I picked up at grad log school to help solve this problem." As he was replying, Frank was thinking to himself that all that tedious work he had put in on his graduate courses would finally serve him well; he could easily work out the problems and submit his recommendations to Colonel Shoot and the 'Old Man' in time to pick up his new blonde girlfriend early on Friday evening for that big trip to Vegas. As he prepared to leave the office, he asked the Colonel, "Will that be all, Sir?"

Colonel Shoot glanced up at Jackson and said, "I'm glad you asked, I'd almost forgotten. I want you to pack your bags; you and I along with the 'Old Man' are going to fly to Wright-Patterson Friday after work to brief the AFLC Commander on Saturday. We expect to return about 2230 local time Sunday, so we can finish up the plans next week." As Captain Jackson silently moaned about his "Lost Weekend" in Vegas, Colonel Shoot said, "I'm sure you won't mind, since you probably haven't worked on a weekend for a year or so while you were taking it easy in that student life."

As Frank trudged back down the hallway to his office, he kept murmuring to himself, "Grown men don't cry, grown men don't cry." By the time he reached his desk, he had almost convinced himself that there would be other weekends for Vegas, and he was beginning to look forward to the task at hand and his trip to Wright-Patt.

Settling down at his desk, Captain Jackson opened the brown envelope and found it contained the following information:

Order of Material:

Current situation
Aircraft characteristics
Jeep carrier details
Air refueling modifications
Status of bases
Package of material on Air Routes, etc.

MEMO ROUTING SLIP	NEVER USE FOR APPROVALS, DISAPPROVALS, CONCURRENCES, OR SIMILAR ACTIONS	ACTION
1 TO: Col Short	INITIALS	CIRCULATE
	DATE	COORDINATION
2		FILE
		INFORMATION
3		NOTE AND RETURN
		PER CONVERSATION
4		SEE ME
Sir:		SIGNATURE

REMARKS

attached is the information you requested re the 222. Pls note the possible options we have for movement:

- Air refueling
- "Jeep" carrier

FROM	DATE
Capt GA Jones	PHONE

DD FORM 1 OCT 60 95 Replaces DD Form 94, 1 Feb 50 and DD Form 96, 1 Feb 50 which will be used until exhausted.

8

Current Situation

The 142d Fighter Interceptor Group (ANG) located at the Greater Pittsburgh Airport, Pittsburgh, Pennsylvania, has been alerted to support the air defense effort in South Korea. Through vigorous recruiting and training efforts, the 142d has been able to keep an excess of combat ready pilots for the F-222 fighter interceptor aircraft. The unit has a 6:1 ratio of combat ready pilots to the number of F-222 aircraft assigned. However, the 142d has only enough maintenance personnel to maintain the assigned aircraft. A build-up of maintenance personnel is underway and, hopefully, within three months enough men can be spared to form the nucleus for three additional squadrons. The only other source of F-222 maintenance personnel is the AMA which has other F-222s in temporary storage.

Because of fund limitations, the F-222 aircraft -- with the exception of the aircraft assigned to the 142d -- were placed in temporary storage (plastic cocoons) on the west coast (SMAMA) in 1966. The aircraft have been inspected regularly for corrosion; however, the mechanical condition is unknown. Consequently, the aircraft must have a complete inspection and test flight prior to use. A cadre of civil servants -- those presently

being used by SMAMA to hold the aircraft in storage -- will possibly be available to assist in the activation.

Aircraft Characteristics

1. Test flight take-off gross wt: 55,000 pounds
2. Normal take-off gross wt: 68,000 pounds
3. Effective wheel-loading at normal touchdown and sink-rate: 75,000 pounds
4. Tailhook equipped
5. Modern navigational aids
6. All weather capability
7. Single-place
8. Average sortie length 1.5 hours
9. Average cruise speed: 800 knots
10. Single wheel landing gear
11. Requires minimum runway length of 5500 feet

Jeep Carrier Details

The following conditions apply to a move of aircraft by a "jeep" carrier:

1. One carrier is available as long as required.
2. The carrier has a capacity of 30 F-222 aircraft.
3. The aircraft must be stored topside, consequently exposed to weather.
4. The transit time from the U.S. to destination is approximately 30 days. NOTE: Aircraft exposed to

salt spray for an extended period of time will probably have corrosion. The usual procedure is to replace the corroded material. This procedure requires very little time provided that facilities are available to handle the exotic metals which are used in the F-222. Aircraft in cocoons seldom experience salt water corrosion.

Air Refueling Modifications

The following conditions apply to the air refueling modifications:

1. The contractor requires a leadtime of 4 months before the first modification can be completed.

2. The production process includes all necessary steps to make the aircraft flyable (i.e., depreservation, inspection, modification.)

3. The estimated cost of production will probably be equal to the cost of establishing a depreservation/inspection facility overseas.

4. Production capability is expected to be 7 aircraft per week.

5. Production capability, if modification is excluded, is 10 per week. In this instance, the aircraft could be placed aboard the carrier in an operational condition. The aircraft still must be test flown at the destination. The lead time for this process is two months.

6. Ferry pilots are available.

7. SAC can provide enough in-flight refueling for 25,000 miles/week of flying distance.

8. The F-222 has fuel capacity of 7800 pounds which will provide a sortie time of 1.5 hours.

9. The F-222 can maintain an average ground speed of 800 knots for a sortie.

10. Enroute servicing (no intermediate maintenance) is available at all bases.

Status of Bases

Five bases are available for use if you choose to establish a depreservation/inspection facility in the Far East: Naha, Okinawa; Kadena, Okinawa; Yokota, Japan; Tachikawa, Japan, and Kisarazu, Japan. (See attachment 4 and 5.)

1. Naha and Kadena. These two bases are deeply involved in support of the Viet Nam campaign. The Commanders have both stated that space is available (no hangar space) on the hardstands. The maintenance facilities are experiencing a backlog of work and do not expect to have excess capacity in the near future. Further, the monsoon season will be starting next month and rainfall is predicted to be unusually heavy. Other units which have performed maintenance during the monsoons without hangar space have, without exception, experienced a decrease in maintenance capability--one (1) to six (6) weeks of backlog. Facilities will be assigned to your support if they become available. Naval facilities exist to offload aircraft from a carrier.

2. Tachikawa. The AMA at Tachikawa was closed in 1962, however, the depot facilities still exist--at least the equivalent of an intermediate maintenance facility. Experienced indigenous labor is available. Hangar space and personnel facilities are available. Weather is no factor. Communist agitators have unsuccessfully attempted to organize labor strikes; however, the Communist, on several recent occasions, have restricted and interfered with military and indigenous personnel who attempt to enter or leave the base. Twice in the past three months, the base has been effectively isolated by the "so-called" union protestors.

3. Yokota. Adequate maintenance and personnel facilities are available; however, the nearest facility with the capability of offloading an F-222 from the carrier is located in Yokosuka, Japan--about 70 miles from Yokota. Since Yokota is only three miles from Tachikawa, the same civil agitation exists. Because of Yokota's important mission in support of Korea and

Viet Nam, the agitators have recently increased the tempo of their demonstrations. Several Americans have been seriously injured. The highways (the last five miles) from Yokosuka to Yokota are narrow and winding.

4. Kisarazu. Kisarazu was part of the Tachikawa depot facility and still has a limited intermediate maintenance capability. Extremely skilled indigenous aircraft maintenance technicians are available. Personnel facilities are available. A 200-ton capacity crane exists on the pier and is capable of offloading aircraft. The harbor is not capable of handling ocean-going vessels; however, it can handle lighters. Because of Kisarazu's isolated location, agitators have not been active.

Spy Plane Task Force Cut to 8 Ships off Korea

WASHINGTON — (AP) — The Navy task force which was assigned to defend U.S. reconnaissance planes off Korea has been cut from an original 29 to only eight vessels, the Pentagon disclosed today.

Remaining elements of the Task Force 71 include the attack aircraft carrier Enterprise and seven destroyer-type ships which are now redeployed from the Sea of Japan, where they first were assigned, to an area southwest of Korea.

Pentagon spokesman Daniel Z. Henkin said the eight remaining ships of the task force are now located "in the Yellow sea-East China sea area.

"OTHER SHIPS that were formed with the task force are either now in port or heading for port in Japan and the Philippines," Henkin said.

As to whether the task force is still protecting unarmed Navy EC-121s like the one which was shot down by North Korea on Apr. 15, Henkin would only say that the remaining naval group is "conducting missions assigned to it."

HENKIN would not confirm reports that the main source of protection for E-121 flights will now be U.S. jet fighter squadrons based in South Korea. He did not deny that an additional F-4 Phantom squadron has been sent to South Korea since the EC-121 crisis.

Henkin gave no explanation as to why the remaining eight ships had been pulled out of the Sea of Japan. He said he had no information at the moment as to whether other ships, not assigned to the task force, may be operating in the Sea of Japan.

"We will have ships moving all the time out there" mainly as part of the usual location of vessels, he said.

LIU PIAO
Prepare for War . . .

Red China Names 5 To Lead

TOKYO — (AP) — Communist China announced today the make-up of a five-man inner council of the Politburo which will wield power over this nation of 700 million.

The council, called the "standing committee" of the ruling Politburo, will be headed by party Chairman Mao Tse-tung. Its other members will be Mao's designated heir to power, Defense Minister Lin Piao, Premier Chou En-lai, Chen Po-ta, who directed Mao's three-year purge called "the cultural revolution," and Kang Sheng, a veteran of secret police work.

A broadcast from Peking monitored here said the five were elected at the first meeting of the new Central committee chosen by the recently concluded ninth national congress of the Communist party.

LIN PIAO, whom communiques from the congress called Mao's "successor," has called upon the Chinese to prepare for war with the United States and the Soviet Union, while continuing to struggle at home against elements identified with the capitalist class.

ATCH 1

Rapid Deployment of Non-Combat Ready Aircraft

SATO'S HOUSE STONED

Japanese Students Riot, Demand Okinawa's Return

TOKYO (AP) - Thousands of leftist students battled police today in wide-ranging skirmishes that left parts of Tokyo under a cloud of tear gas as demonstrators chanted demands for Okinawa's return from U.S. rule.

Six hours after the violence erupted, police said 65 policemen has been injured and six hospitalized. They said 568 students had been arrested, but could give no estimate of student injuries.

Demands for abolition of the U.S.-Japan security treaty were also heard as an estimated 5,000 students snake danced through scattered part of the city. In downtown Tokyo the rioters battled police under the bright lights of the Ginza area.

ABOUT 12,000 riot police sealed off what they thought was the student's prime target, the district including government offices and the U.S. embassy.

At one point six students slipped past guards surrounding U.S. military billet, made it up six stories to the roof and shook out five red banners demanding the return of Okinawa to Japan. The six were arrested.

The riots swirled about Tokyo's colleges, government offices and downtown business sections. Chanting, dancing and lobbing rocks or swinging sticks, the students adopted a strategy of confronting riot police, then ducking down side streets when authorities charged.

AT SOME places it became a battle of the barricades, with police sealing off main streets to keep out the rioters.

One such clash broke out midway between the Tokyo and Shimbashi stations. The students cheered when one youth seized a tear gas grenade and hurled it back into police ranks, but backed off when a police water cannon opened up.

The students broke and ran when police, announcing arrests would be made, began a charge. Many of the youths were blocked in by police at the other end of the street but some disappeared down side streets.

ONE OF the first clashes came when militant students stoned Prime Minister Eisaku Sato's private residence. A spokesman for 67-year-old Sato said the prime minister was at home when 100 students wearing red helmets rushed up. He said Sato did not appear shaken by the incident and there was no damage to the house.

Police dispersed the students by firing tear gas, and one officer was injured.

Later, about 3,000 students converged on Tokyo's central railway station and marched down the tracks toward Shimbashi station.

IN ONE police charge at Shimbashi, police said 19 students jumped or fell from a railroad bridge to the street 20 feet below and some were seriously injured.

A Japanese cameraman for the American Broadcasting Co., Sueyuki Nojima, was hit in the head by a flying object at Shimbashi and hospitalized. Ichizo Kobayashi, sound man for Columbia Broadcasting System, was hit in the jaw by a rock and required stitches.

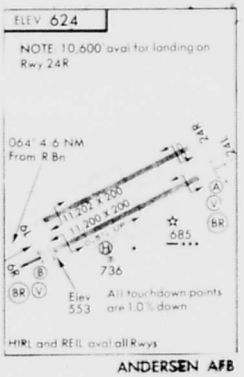
Train traffic was halted, but some buses and subways kept running.

DESPITE the tear gas and government warnings to stay home, thousands of persons watched the melees.

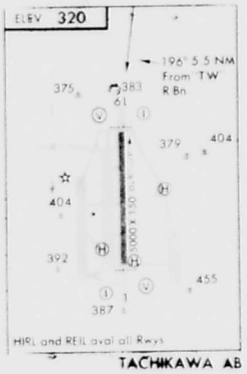
Most shop owners had prudently covered their windows but many huge plates of glass were reduced to shards and hurled as weapons.

Rapid Deployment of Non-Combat Ready Aircraft

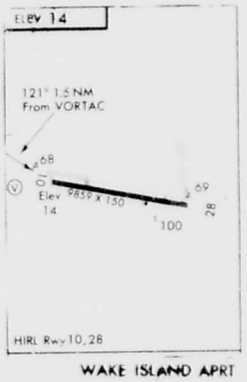
DOD
FLIGHT INFORMATION PUBLICATION
(TERMINAL)



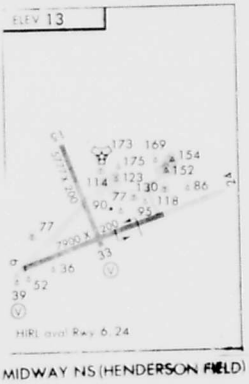
ANDERSEN AFB



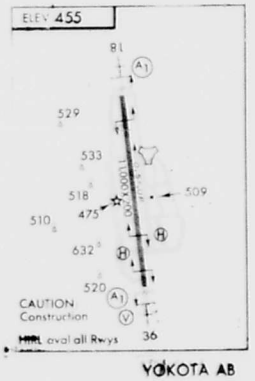
TACHIKAWA AB



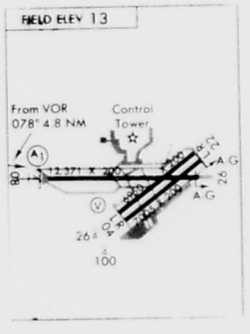
WAKE ISLAND APRT



MIDWAY NS (HENDERSON FIELD)



YOKOTA AB

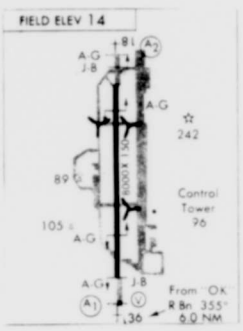


HONOLULU INTL APRT

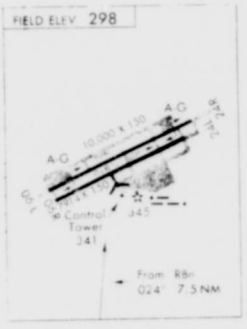
16

ATCH 2

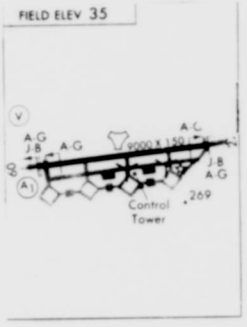
Rapid Deployment of Non-Combat Ready Aircraft



NAHA AB



AGANA NAS



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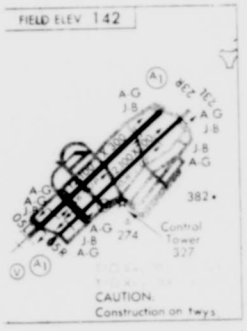
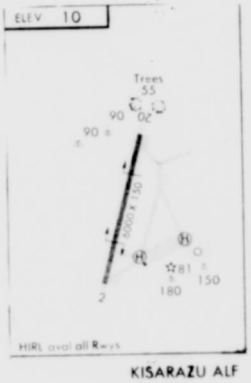


KADENA AB



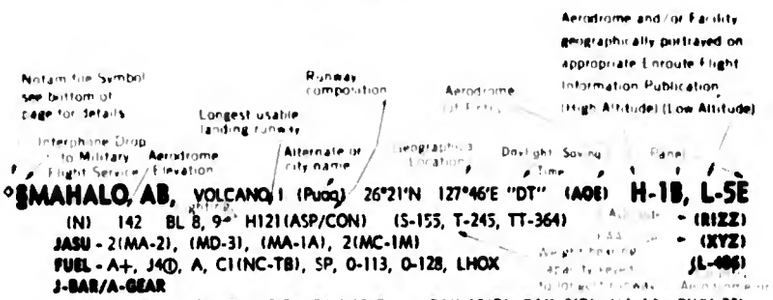
KISARAZU ALF

17

AERODROME/FACILITY DIRECTORY LEGEND

The following detailed legend is provided to assist you in becoming familiar with the format used in the Aerodrome/Facility Directory. When the information presented is self-explanatory, it will not be covered in this legend.

SAMPLE



RUNWAY DATA

GENERAL Runway surface material is classified as either Hard or Other. A hard surface is considered to be permanent and requires little maintenance. The letter H precedes the length figure at aerodromes considered to have hard surface runways. Absence of an H means other than hard surface. The surface material is shown in parentheses following the runway length and is the visible material or composition of the major landing portion of the runway.

LENGTH The length of the active landing portion of the longest usable runway shown to the nearest 100 ft (add 00). 70 shall be the division point, e.g., 10769 ft = 107, 10770 ft = 108. The longest usable runway is the runway which has the longest landing area after all restrictions have been applied. Thus, a 10,000 ft runway may be depicted in FLIPS as only 8000 ft when the threshold has been displaced 2000 ft due to sterilization, construction, etc. Variations in runway length for landing and takeoff shall be clarified in the Aerodrome Remarks Section.

SURFACE

1 **HARD** — (ASP) Asphalt. Hot or cold laid plant mixes of asphalt cement with graded crushed aggregate. Includes crushed stone rolled to form a smooth hard surface and bound with a permanent bitumen binder.
(BED ROCK)
(BRICK) Laid and mortared.
(CON) Concrete. Stone, sand, cement and water mixture.

2 **OTHER** — (BITUMEN): A coal tar or petroleum product binding, usually with sand and/or gravel. (Do not confuse with bitumen bound macadam.)
(MACADAM) Crushed stone rolled to form a smooth, hard surface and bound with a temporary binder such as clay, earth, etc.

(CINDERS)	(EARTH)	(GYPSUM)	(OIL)
(CLAY)	(GRASS)	(LATERITE)	(SAND)
(CORAL)	(GRAVEL)	(LIMESTONE)	(SOD)
			(TURF)

(AM-2) Aluminum Matting
(MX19) Aluminum Matting
(MBAI) Light-duty Steel Matting
(PAP) Pierced Aluminum Plank
(PSP) Pierced Steel Plank
(UNK) Surface Material Unkown

AERODROME/FACILITY DIRECTORY LEGEND

RUNWAY WEIGHT BEARING CAPACITY

S	— Runway weight bearing capacity for aircraft with single wheel type landing gear. (C-47), (F-100), etc.
T	— Runway weight bearing capacity for aircraft with twin wheel type (includes single tandem) landing gear. (C-124), (B-47), etc.
TT	— Runway weight bearing capacity for aircraft with twin tandem wheel type (includes quadricycle) landing gear. (B-52), (C-135), etc.
AUW	— Maximum runway gross weight bearing capacity for all aircraft, irrespective of landing gear configuration.
SWL	— Single wheel loading. (This includes information submitted in terms of Equivalent Single Wheel Loading and Single Wheel Isolated Loading). Tire inflation pressure given when available. e.g. (SWL 00/T.P. 250 PSI.)
PSI	— Pounds per square inch. PSI is the actual figure expressing maximum pounds per square inch runway will support, e.g. (PSI 535).
C-54	— Aircraft by type based on past usage when more specific information is not known.

NOTE: Runway weight bearing capacity (gross weight) is determined by adding 000 to figure following S T TT and AUW A blank space following the letter designation is used to indicate the runway weight bearing capacity is sufficient to sustain aircraft with this type landing gear, although definite figures are not available, e.g. (T). Runway weight-bearing capacity given is for unlimited operations; aircraft weights higher than given require prior permission from the aerodrome controlling authority.

NOTE: Omission of weight bearing capacity indicates information unknown. Footnoted remarks are used to indicate a runway with a weight bearing capacity greater than the longest runway, or weight restriction of taxiways, aprons or other runways.

JET BARRIER/ARRESTING GEAR

A-GEAR

The following list identifies current operational tail hook systems identified by both Air Force and Navy Terminology:

Although the Air Force and Navy arresting systems are listed on the same line, this does not mean that the systems' operational characteristics are identical. REFER TO CURRENT AIRCRAFT OPERATING MANUALS FOR SPECIFIC ENGAGEMENT WEIGHT AND SPEED CRITERIA BASED ON AIRCRAFT STRUCTURAL RESTRICTIONS AND ARRESTING SYSTEMS LIMITATIONS.

NOTE: Aerodrome listings may show availability of other than U. S. military arresting systems. This information is provided for emergency requirements only.

Bi-Directional (B)

AIR FORCE	NAVY	
BAK-6	E-14	Water Squeezer
———	E-6	Reel Type
———	E-16	Metal Bender (series of reels)
———	M-2	Morest-Mobile Arrestment Gear (2 hydraulic units) may be installed on permanent basis
BAK-9	E-27	Rotary Friction Brake
———	E-15	Two E-27 A-Gears
BAK-12	———	Rotary Friction Brake
———	M-21	Rotary hydraulic operational arrestor, short runout
———	E-28	Rotary hydraulic
BAK-13	———	Rotary hydraulic

Uni-Directional

———	E-5/E 5-1	Chain Type

J-BAR

Current barrier systems for aircraft with or without tail hook capability are as follows.

Uni-Directional

MA-1A	Nylon webb barrier between stanchions attached to chain type arresting gear
Safe Bar	Safeland barrier Non-US nylon net barrier system used in Europe and Asia (Engage with closed canopy)

COMBINED J-BAR/A-GEAR

Uni-Directional

MA-1A MODIFIED MA-1A/E-5	Nylon webb barrier between stanchions combined with pendant type cable and attached to chain type arresting gear
MA-1A/BAK-9, BAK-12, or E-27	Nylon webb barrier between stanchions attached to arresting gear and with hook pendant (may be converted to bi-directional on request)
BAK 11	Pop up engaging device used with any type energy absorber (BAK-9, BAK-12, or E-27) to engage main landing gear

Location of Gear: The arresting gear is depicted as it is located on the runway and the information should be read left or right, depending on the runway in use or landing direction The middle portion of the runway is indicated by a dash ———, and the distance of the arresting gear from the end of the runway (or into the overrun) on the end on which the gear is located is indicated in parenthesis under the applicable gear Arresting gear which has a bi-directional capability and can be utilized for emergency approach end engagements is indicated by the symbol (B). See example A CAUTION Up to 15 minutes advance notice may be required for rigging A-Gear for approach end engagement MA-1A gear may not be used for approach end engagements Direction of engagement of E5/E5-1 chain type gear is indicated by an arrow, i.e., ←E5-1. See example B.

J-Bar/A-Gear (Example A)

RWY 18 MA-1A, BAK-6(B), BAK-12(B)———BAK-12(B), BAK-6(B), MA-1A RWY 36
(150' OVRN) (600') (1000') (1200') (600') (150' OVRN)

(Example B)

RWY 03 ←E5-1, E5-1→, ←E5-1———E5-1→ RWY 21
(1465') (2148') (3260') (957')

AERODROME/FACILITY DIRECTORY

°AGANA NAS, GUAM I. 13°29'N 144°48'E (AGE) **T-2G**

N(CG) 298 BL6 H100(ASP/CON) (SWL-59, S-125, T-214, TT-372) (PGUM)

JASU - 6(GTC-85) (NC-5), 2(NC-7), 4(NC-10), 2(NCPP 105)

FUEL - A+, J4, J5①, 0-117, 0-128, 0-133, 0-148, 0-156, SP, ADI, PRESAIR, LOX, OXRB, LHOX, JATO

A-GEAR

RWY 06L E-15-1(B) (1550') ——— E-15-1(B) (1650') RWY 24R

AERODROME REMARKS - Tran Alert/Maint aval 24 hrs. CAUTION: Twr 741' MSL lctd 1 mi ENE from end of Rwy 06L. Acft depart 06L or 06R should not make rgt turn until 1000 ft. Left ptn 06L and 06R, right ptn 24L and 24R. Do not exceed 1300' in tfc ptn. Medium ints lgts Rwy 06R-24L. ① Aval for transient carrier acft only. 2 hr ntc rqrd.

°§HICKAM AFB, HAWAI, Oahu I. 21°20'N 157°57'W (AGE-PCB) **L-2E**

(Utilize Honolulu Intl Aprt) (PHIK)

AF

JASU - 17(C-26), 6(MA-1), 2(MD-3), 3(MD-3M), MXU-4A

FUEL - A+, J4, 0-123, 0-128, 0-133, 0-148, 0-156, SP, PRESAIR, ADI, W, WAI, LOX, LHOX

AERODROME REMARKS - Clsd to all tkofs and ldgs, all former rwys used to park acft. All tfc use Honolulu Intl. Use Honolulu Twr for all airborne ops. All acft arr Hickam laden with dangerous materials will provide Airlift Command Post, PTD, or GND CON; info rqrd IAW AFM 55-14, Para C. Tran Alert/Maint aval 24 hrs dly. Men and eqpt working all areas of aerodrome. Pilots of aircraft carrying DV's will call Hickam Dispatcher 15 to 30 min prior to touchdown to confirm block time. For customs and agricultural procedures SEE SEC II, FLIP PLANNING. All aircraft entering Hawaiian Islands from outside US/US Possessions/Trust Territories are subject to US Quarantine/Public Health Inspections before crew and passengers debark from aircraft.

°§KADENA AB, RYUKYU IS., Okinawa I. 26°21'N 127°46'E (AGE) **H-1A, L-5C**

AF 142 BL6, 7, 8, 9 H121(ASP/CON) (S-155, T-245, TT-364) (ROAH)

JASU - 2(MA-2), (MD-3), (MA-1A), 2(MC-1M)

FUEL - A+, J4, 0-128, 0-133, 0-148, 0-156, Jet Lub, SP, ADI, W, WAI, PRESAIR, LPOX, LOX

J-BAR/A-GEAR

RWY 05L MA-1A MOD, BAK-9(B)① (THLD) ——— BAK-9(B)①, MA-1A⑩ (1500') (1150') (1100') RWY 23R

RWY 05R BAK-11/12, BAK-9(B)① (1125') (2200') ——— BAK-11/12, BAK-9/MA-1A (2150') (THLD) (50' OVRN) RWY 23L

AERODROME REMARKS - 3 hr svc delay for trans acft ex MAC sked, Air Evac and SAC acft. Rwy wind info is aval fr Con Twr on winds on the end of each rwy. Use extreme ctn when taxiing, extv veh tfc on twys. Tran Alert/Maint aval 24 hrs dly. Acft will not be operated below 2500' within the Kadena Airport traffic area without a clearance from Kadena Control Tower. Inbound acft may expect extv holding or diversion due to priority departures. Pilots of military and civil contract aircrafts carrying VIP (Code 7 or higher) will confirm block time to Kadena Airways, GCI, Kadena ACP, or Kadena Pilot to Dispatch (PTD) with request to pass to 313th Command Center. SEE SPECIAL NOTICE. ① 15 min ntc rqrd for app and engagement. ⑩ 20 min ntc rqrd to activate barrier.

°§KISARAZU ALF, JAPAN, Honshu I. 35°24'N 139°55'E **H-1C, L-3B, T-2F**

N (JGSDF) 10 BL6 H60(ASP/CON) (S-69, T-90, TT-135) (RJTK)

JASU - (NC-5), (GTC-85), (RCPT-105)

FUEL - A, J4, 0-128, 0-128, 0-132, 0-133, 0-156, SP, LHOX

A-GEAR

RWY 02 M-2(B) (2100') ——— E-5 → (1900') RWY 20

AERODROME REMARKS - OFFL BUS ONLY. 2200-1000Z OT O/R 1 hr ntc. Jet tfc 800' conv tfc 800'. Rgt tfc Rwy 20, trees 55' high 300' fr app end Rwy 20. No tran maint. CAUTION: Extv heli trng 2200-1000Z.

AERODROME/FACILITY DIRECTORY

***OSAN AB,** KOREA 37°05'N 127°02'E (AGE) **H-1B, L-4E**
AF 35 BL6, 7, 8, 9, 10 H90(CON) (S75, T168, TT268) (RKSO)
JASU - 8(A-1) 1(A-3A) 3(C-21B) (MA-1A) 3(C-22A) 9(C-26) 5(MA-1)(MC-1A) 8(MC-1M) 7(MD-3A)(MD-3)
FUEL - A+, J4, SP, 0-148, LPOX, LOX
J-BAR/A-GEAR
RWY 09 MA-1A MODIFIED, BAK-9(B)Ⓘ——BAK-9(B)Ⓘ, MA-1A MODIFIED RWY 27
(50' OVRN) (1500') (1500') (50' OVRN)
AERODROME REMARKS - PPR ex MAC and 315th Air Div. Extv const twys and ramps. Expect ldg and taxiing delays up to 20 min. Tran maint aval 24 hrs dly. Jet tfc ptn 1500 ft, lefthand ptn. Lefthand entry Rwy 27, righthand entry Rwy 09. CAUTION: Hvy jet tfc to Suwon, crosses final app to Osan Rwy 27. Pilots request to turn off REIL lighting, Rwy 27, will result in rwy lights off for 10 seconds. Ditches 10 feet deep 150 ft fr both sides rwy. All acft making VFR app(s) to Suwon Rwy 33 cross Osan extended centerline Rwy 27 at or above 3000 ft. Hvy vehicular tfc on twys. Pilots of mil and civ acft carrying VIP (Code 7 or higher), will confirm block time to Tsugu Con, Osan Twr or App Con, or GCI when entering Tsugu FIR. Ⓑ Bi-directional capability with 15 min ntc.
L-1C, T-2H

***MIDWAY NS,** MIDWAY I. (Henderson Field) 28°12'N 177°23'W "DT"Ⓑ
N 13 BL4, 6, 9 H79(ASP) (SWL-92/T.P. 150 PSI, S-195Ⓓ, T-260, TT-390) (PMDY)
JASU - 1(GTC-85) 3(NC-7) FUEL - A+, J4, 0-128, 0-133, 0-148, 0-156, SP, LHOX, LOXⒹ
A-GEAR
RWY 06——E-5-1 →, ←E-5-1 RWY 24
(2621') (1500')
AERODROME REMARKS - Open to mil acft only. Tran alert maint aval 24 hr dly. VASI Rwy 33 unusable UFN. Numerous birds in vic fr Nov to Aug present hazard to flt. 3350 ft unlgtd ovrn Rwy 06 usable for emerg. CAUTION: Water on Rwy 15-33 hazardous dur and after rain. Ⓓ Ltd quantity. Ⓔ 1300Z 30 Apr to 1200Z 29 Oct. Ⓕ (S-88/T.P. 400 PSI).
H-1C, T-2F

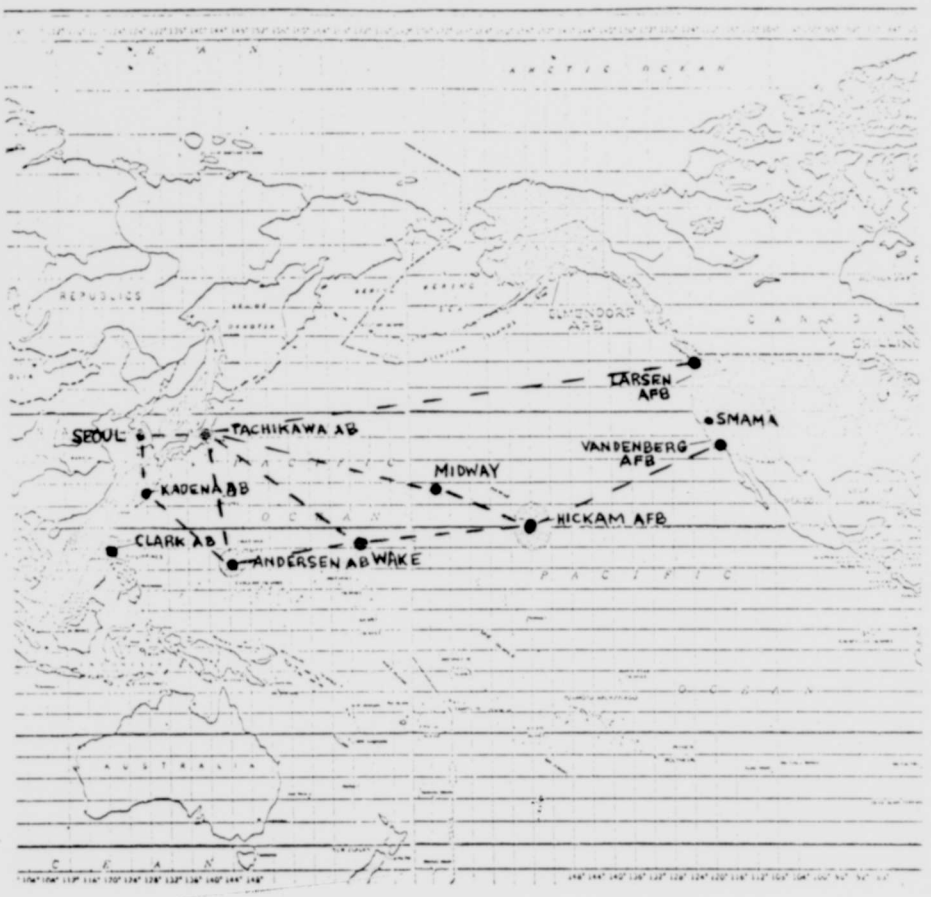
***TACHIKAWA AB,** JAPAN, Honshu I. (Tokyo) 35°42'N 139°24'E (AGE)
AF 320 BL6, 9, 10 H50(ASP/CON) (S100, T200, TT300) (RJTC)
JASU - 1 (A-3), 1 (C-22)
FUEL - A+, J4, SP, ADI, 0-148, LPOX
AERODROME REMARKS - CAUTION: Several unlgtd flagpoles aprx 300'-375' MSL, concentrated in an area aprx 1000' wide extending from aprx 1000' to 2000' from app end Rwy 19, app and dep hazard. Tran Alert/Maint aval 24 hrs dly. Controlling obst for N dep 383' MSL, 1890' off N end rwy. Controlling obst for S dep 387' MSL, 3285' off S end rwy. Unlgtd ant 420' MSL, 4000' ESE Rwy 01, circling app and heli hazard. Unlgtd ant 423' MSL, 4729' off S end rwy, 1250' E of centerline, dep hazard. Classes A and B explosives, group A and B chemical munitions prah. Flying over hosp E of rwy prah. Tfc ptn alt, rectangular 1300', 1800' overhead tfc. Jet act prah. Circling app auth to E only. Compliance with VFR entry and dep procedures as shown in this supplement "Arrival and Departure Charts Section" are mandatory except as directed by local Base Regulations for locally based acft. Use of ovrn mandatory for thst. PAR touchdown 500' fr ldg thld, Rwy 01. Thld Elev 28'.
H-1C, L-3B, T-2F

***YOKOTA AB,** JAPAN, Honshu I (Tokyo) 35°44'N 139°21'E (AGE)
AF 455 BL6, 7, 8, 9 H110(CON) (S-150, T-300, TT-478) (RJTY)
JASU - (MD-3) 4(MA-1A) 1(MC-11)
FUEL - A+, J4, SP, WⒹ, WAI, ADI, 0-128, 0-148, LPOX, LOX
J-BAR/A-GEAR
RWY 18 MA-1A MODIFIED, BAK-9(B)Ⓘ——
(102' OVRN) (1500')
——BAK-9(B)Ⓘ, BAK-13(B)Ⓘ, MA-1A MODIFIED RWY 36
(1000') (2910') (276' OVRN)
AERODROME REMARKS - Trans Alert Maint aval 24 hrs, no recip Prop/Eng maint aval. CAUTION: Extv const on twys. Due to high density civ and mil acft in the Kanto Plains area, all inbd trans acft are requested to retain or establish IFR etc with RAPCON and terminate flt with one app or ldg. No VFR apps by trans acft are auth except in emerg or with prior approval from the Supervisor of Flying. Jet tfc ptn 2000 ft. Comml tfc at 1500 ft, rpt tfc Rwy 18. 12 ft fence, houses and 20 ft trees bnkd 20 ft E of S ovrn. Railroad underpass 16 ft high 1700 ft upp end Rwy 18. 3 unlgtd Twrs 75' high ½ mile fr app end Rwy 36 on rwy centerline. CAUTION: Extv twy const W and E parallel twys. Const minor repairs all twys and rwys. SEE SPECIAL NOTICE SECTION. Ⓓ Ltd quantity. Ⓔ Ex-passed at all times. Extreme emerg only. Ⓕ 15 min prior ntc rqrd.

***WAKE ISLAND,** WAKE I. 19°17'N 166°38'E **L-1C, T-2H**
FAA (AF) 14 BL6, 9Ⓓ H98(ASP) (TT398) (PWAK)
JASU - C26, 8 (MD-3), 4 (MA-1A), 2 (MC-11), 6 (502-7D)
FUEL - A+1, J4, (NC-TA11), 0-123, 0-128, 0-148, SD, ADI, W, PRESAIR, LPOX, LOXⒸ
AERODROME REMARKS - Clsd to acft carrying class A explosives with grd time exceeding 2 hrs. Parallel twy open 7500' fr E to W, W 2500' portion clsd till aprx 27 April 69. Taxi with CAUTION. Unlgtd 90' poles 1800' S to SW East end of rwy. 900' coral stopway E end, unlgtd at night. CAUTION: Bird hazard on app to Rwy 10 or Rwy 28 dep. Ocean vessels with mast aprx 125' MSL periodically located at mooring buoys 3800' W of thld Rwy 10. Obst lgtd. SEE SPECIAL NOTICE. Ⓓ For USAF acft only 36 hrs ntc. Ⓔ 2.8i° Glide Slope for Rwy 10.

Rapid Deployment of Non-Combat Ready Aircraft

AIR ROUTES



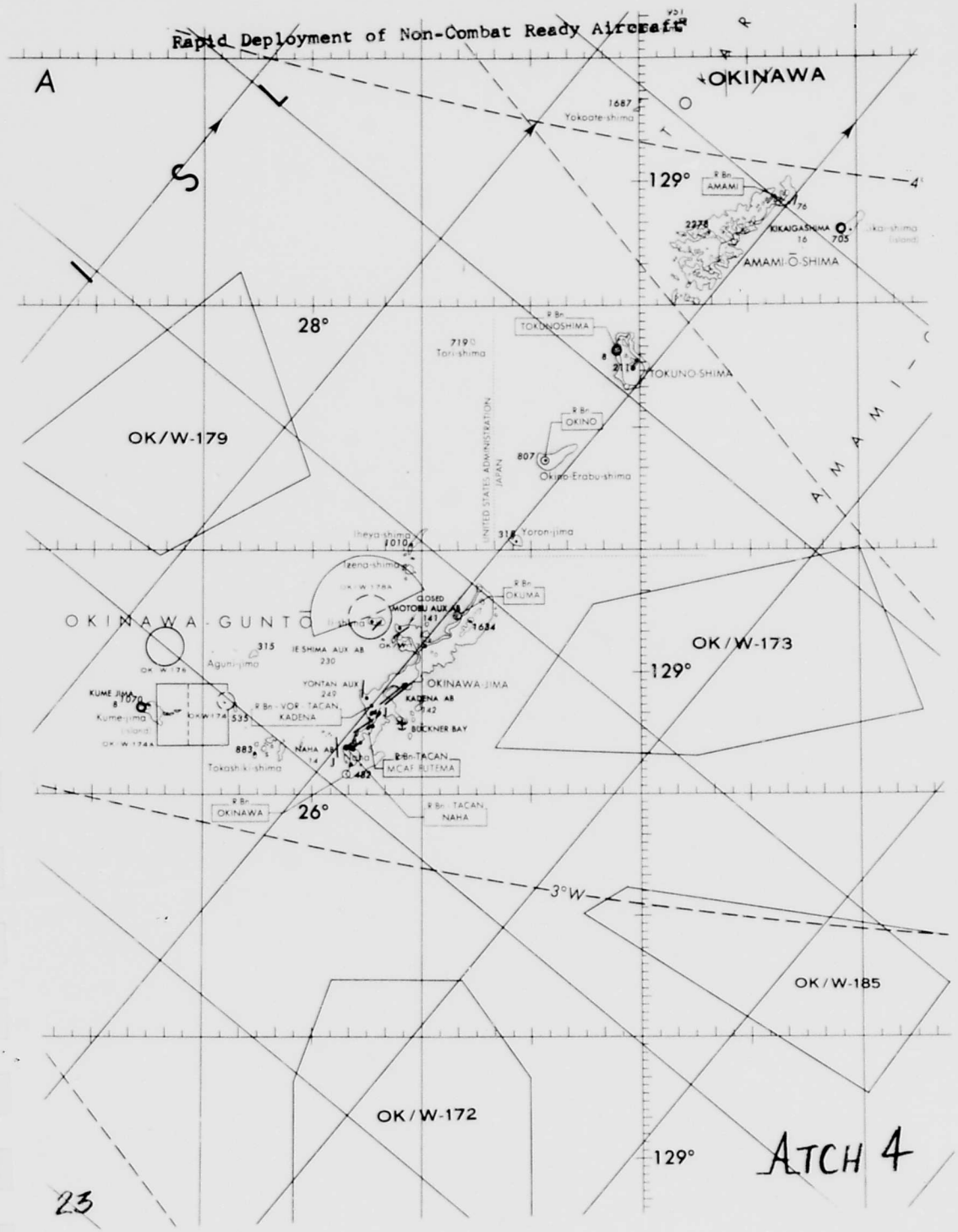
DISTANCES IN NAUTICAL MILES

Seattle--Tokyo	4700
Los Angeles--Hawaii	2560
Hawaii--Midway Island	900
Hawaii--Wake Island	2310
Wake Island--Tokyo	1990
Wake Island--Guam	1510
Guam--Okinawa	1400
Guam--Tokyo	1600
Okinawa--Seoul	1100
Tokyo--Seoul	710
Midway Island--Tokyo	2200

ATCH 3

22

Rapid Deployment of Non-Combat Ready Aircraft



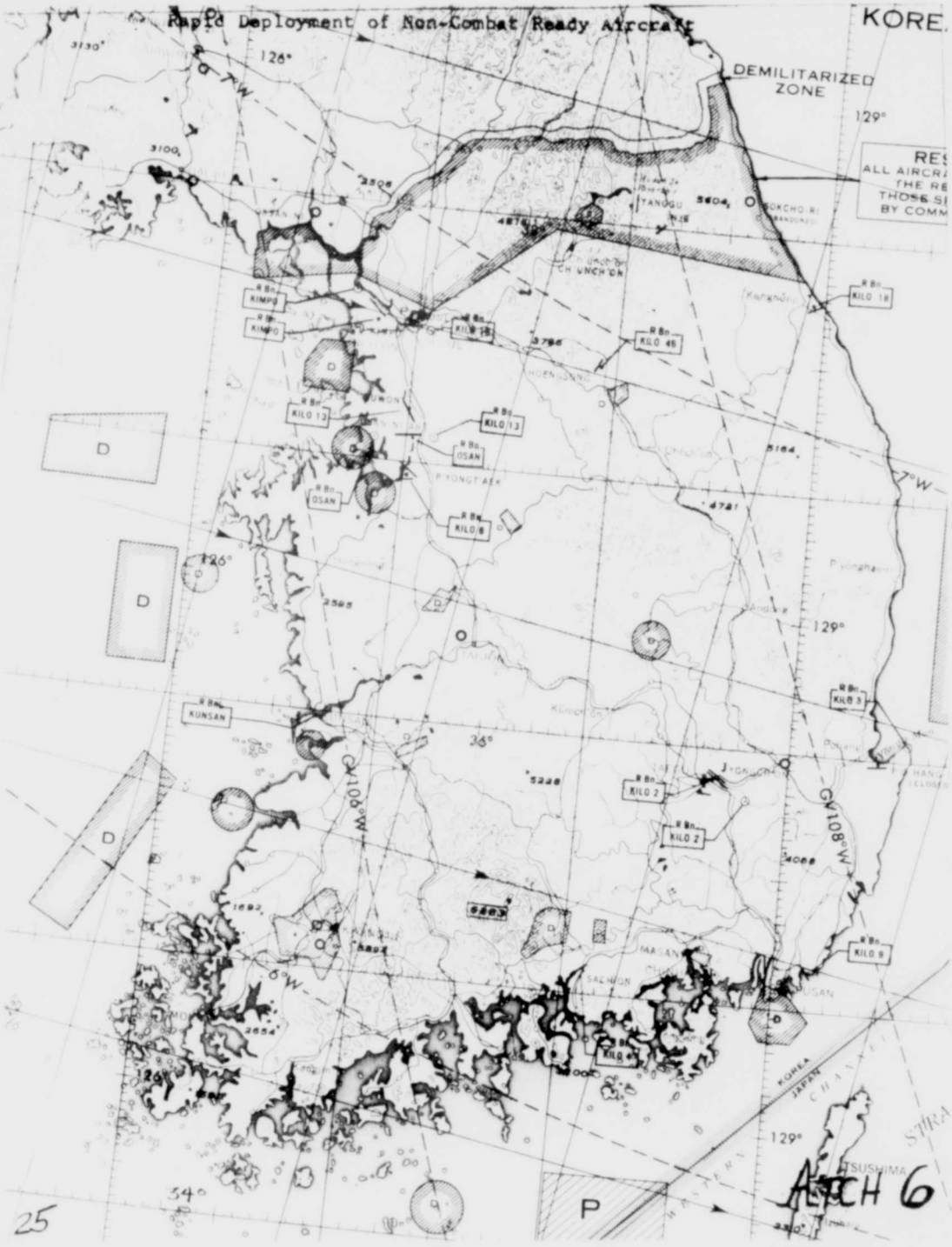
ATCH 4

23

Rapid Deployment of Non-Combat Ready Aircraft

24

ATCH 5


Rapid Deployment of Non-Combat Ready Aircraft
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KILO 46
KILO 13
OSAN
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KUNSAN
KILO 3
KILO 2
KILO 9
KILO 8
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129°
36°
34°
GV108°W
TSUSHIMA
ATCH 6
25

Rapid Deployment of Non-Combat Ready Aircraft

DIRECTION

Now that YOU have read the information, how would you recommend sending the aircraft overseas?

ANALYSIS

STATEMENT OF THE PROBLEM

Non-combat ready aircraft must be sent to Korea to support Allied operations. The logistics planner must arrive at the best method for getting them overseas.

PERTINENT FACTS

1. Aircraft characteristics. The aircraft's technical characteristics eliminate the use of the airfields on some bases.

2. Political unrest. The aircraft must be moved onto a base. If the aircraft are flown onto the base, no problem exists. If the aircraft must be transported by highway, the agitators can be expected to interfere.

3. Maintenance facilities. The complexity of aircraft requires that large quantities of test equipment be used. This, in turn, requires that the costly test equipment be protected from the weather. If intermediate maintenance (depreservation/inspection is of this type) is to be performed, hangars are almost mandatory.

4. Proximity of bases. The concentration of Yokota, Tachikawa, and Kisarazu within short distances of each other offers, effectively, one large maintenance capability in the Tokyo area. The bases' capabilities should not be used independently.

5. Operational capabilities. The DMM is in no way responsible for the operation of the aircraft in Korea. His concern is to deliver an operationally ready aircraft to Korea as soon as possible. The operations personnel should be informed of the DMM's plans.

ASSUMPTIONS

1. Cost will be a factor in arriving at a decision.

2. The problem at hand is urgent.

ALTERNATIVES

1. The SAC mid-air refueling capacity is 25,000 miles/week regardless of route or combination of routes. Based upon a mid-air refueling capability, the distances of each leg of each route, and the fuel carried by the F-222, the aircraft may be delivered at the following rates:

ORIGIN	DESTINATION	DISTANCE-(A/C Fuel)	DEL'Y RATE (A/C/wk)
Seattle	Tokyo	4700-1200=3500	7.1
Los Angeles	Hickam	2560-1200=1360	18.5
Hickam	Midway	900-1200= 300	51+
Hickam	Wake	2310-1200=1110	22.5
Wake	Tokyo	1990-1200= 790	31.7
Midway	Tokyo	2200-1200=1000	25.0
Wake	Guam	1510-1200= 310	51+
Guam	Kadena	1400-1200= 200	51+
Kadena	Seoul	1100-1200= 100	51+
Tokyo	Seoul	710-1200= 490	51+

After including the refueling modification lead time of 4 months, the 51 aircraft could be delivered in at least 23.3 weeks by flying 7 aircraft per week on the Seattle to Tokyo leg. Any other route will result in inefficient use of the SAC refueling capability and further delays.

2. If the aircraft are depreserved before shipment, the lead time (2 months) plus the production rate (10/week) will result in inefficient use of the jeep carrier. Remember, the carrier has a capacity of 30 aircraft and a two-way transit time of 60 days. This procedure will provide a delivery time of 23 weeks; however, salt water corrosion will cause other delays. In addition, specialized equipment for exotic metals must be available at the destination. Also, the test flight of each aircraft must still be accomplished. The total time for this complete process is unpredictable.

Rapid Deployment of Non-Combat Ready Aircraft

SOLUTION

This type of problem is very complex and is not amenable to a set solution. However, the planner should:

1. Coordinate his planning with all the involved agencies.

2. Thoroughly investigate the available facilities as they relate to the particular aircraft being moved.

In addition to these guiding criteria, the key to this problem is urgency. The planner should understand that the establishment of modification production lines require time. If possible, the use of existing facilities will usually provide the best solution to short-range problems, but the short-range solution, suggested below, may well be more costly in the long run. However, a long run may not exist if the urgently needed support is not provided. The existing capability should be thoroughly investigated before new variables (contractors) are introduced.

Suggested Solution

The best procedure uses the "jeep carrier" and the bases in Japan. The lack of facilities on Okinawa could cause considerable delay (same time as Japan + delays). At first sight, the Japanese bases appear to be infeasible. For instance, Tachikawa does not have an adequate

runway, access to Yokota is restricted by Communist sympathizers and poor roads, and Kisarazu's runway cannot handle the landing weight of the F-222. The following steps can be used to circumvent these problems:

1. The aircraft can be off-loaded from the "jeep carrier" to a lighter at the Yokosuka Naval Base. The lighter can be moved across the Tokyo Bay to Kisarazu and the aircraft off-loaded by the 200-ton capacity crane.

2. The aircraft maintenance can be performed at Kisarazu. Because of the runway limitation on landing weight, the test pilot can fly from Kisarazu but must land at Yokota. This circumvents the poor roads and agitators. If the aircraft passes the test flight, it will then be flown from Yokota to its ultimate destination. If the aircraft fails the test flight, a small detachment of maintenance technicians will be available to perform corrective maintenance. Remember adequate intermediate maintenance capability exists at Yokota and the remnants of the Tachikawa depot are available.

These procedures will result in a delivery time of 17 weeks. The first "carrier" will arrive after 30 days. By the time the "carrier" arrives with the remaining 21 aircraft, the original 30 will be operational (about 8 days before the "carrier" arrives). The production line will almost be continuous.

Rapid Deployment of Non-Combat Ready Aircraft

GUIDE

The case and directions should be given to the student during one class period. Instructions should be given to have the student return the solution the following class period.

CASE L

OPERATION FANTASIA

BRIEF: The Deployment of our weapons systems is important to our defense posture. These operations provide the logistics planner with a multitude of problems. This case will acquaint you with some of the variables which must be considered in an actual deployment.

SITUATION

At the turn of the decade, the decision was made by the Secretary of Defense to replace the Strategic Aerospace Command's existing bomber forces with the revolutionary B-XX, a totally new manned bomber weapon system. It was determined that one-hundred of the new bombers would have the same capability as the existing bomber forces. The B-XX, a variable swept wing, four engine, mach four (2400 miles per hour) aircraft was to be stationed at Pease AFB, New Hampshire; Wright-Patterson AFB, Ohio; Offutt AFB, Nebraska; and Castle AFB, California. All four bases were to be assigned twenty-five new bombers and thirty KC-135's.

Because of its importance in the national defense structure, the B-XX project was assigned a force activity designator I. However, due to the complexity and cost of the B-XX weapons system, the Secretary of Defense directed that cost effectiveness would be given primary consideration at all times except where it may cause a degraded capability to perform the unit's primary mission. The mission of each B-XX unit required ten new bombers and ten KC-135's on alert as a strategic retaliatory force, with the remaining aircraft to

be used for training flights. The training flight schedule consisted of fifty percent of the flights having less than a two hour duration, eighty percent having less than three hours, and no flights having more than four hours. Considering a safety margin of reserve fuel, the B-XX was designed to fly for one and one-half hours between refuelings (3600 miles).

Only the four B-XX bases were to be provisioned with the required materiel support and refueling capability, peculiar to the new aircraft. The KC-135's would be modified so that only JP-7, the special fuel required by the B-XX could be transferred through the air refueling boom. The KC-135 would carry JP-4, for its own use, in the wing tanks and JP-7 in the body tanks.

Because of the special features that were incorporated in the B-XX to enable it to operate at its designed speed, special maintenance techniques had to be developed.

Although the mechanism that was required to change the angle of sweep of the wings had proven to be ninety percent reliable during tests, failure of the mechanism during flight required an immediate landing at the nearest airfield. Since the aircraft would become

hot (800°F skin temperature) during flight, fuel could not be dumped during an emergency. Furthermore, landing this aircraft with a greater than safety reserve fuel load would cause the four main landing gear tires to blow out (caused by the combination of landing speed and weight). This meant that when the B-XX was in flight and the wing mechanism failed (.1 probability), it would have to land immediately, causing the tires to blow out in the process. With blown out tires the aircraft was only taxiable for one-hundred yards. In order to tow the aircraft with blown out tires, special dollies had to be placed under both main landing gears and the aircraft towed with a special tow bar.

Due to the possibility of the aircraft landing at a base other than one of the four B-XX bases, special air transportable packages were established at the four bases to be flown to the recovery site, as required (see attachment II). Regardless of the maintenance required, one basic package and at least 30,000 pounds of JP-7 was required to service and relaunch the B-XX. The basic package would be augmented with one or more of the other packages depending on the nature of the maintenance required. Each B-XX base

could provide two basic packages and one of any other package (total of three packages per base) from its assets without affecting its operational capability.

The basic package and 40,000 pounds of JP-7 could be airlifted by one KC-135. Likewise, all of the other packages, with the exception of the engine change package and the hydraulic repair package, could be carried by a KC-135. However, any cargo carried by the KC-135 decreased the weight of the JP-7 load by the weight of the cargo load.

The KC-135 could take off with a 75,000 pound payload, but could land with only a 60,000 pound payload. The C-130 could take off and land with a 70,000 pound payload, and the C-141 could take off and land with a 100,000 pound payload. The KC-135 was available for use within two hours of notification; however, the C-130 and C-141 required a notification of one day so that they could be rescheduled. Use of the CSA in support of the B-XX mission was not contemplated at this time.

In 1975, one year ago, the B-XX weapons system became operational, exactly as planned, During the year of operation all systems were outstandingly

5

successful, with the exception of two areas. First, although many tests and modifications have been made, the wing mechanism is still only ninety percent reliable. Secondly, because of the great difference in their speeds, the B-XX has shown some difficulty in making a rendezvous with the KC-135 in order to accomplish aerial refueling. The average rate of completed aerial refuelings has been ninety percent. However, in spite of these two areas of poor reliability, the aircraft is considered to be a very effective weapons system.

Last week the Joint Chiefs of Staff directed the Strategic Aerospace Command to have an operations order submitted for approval within ten days to deploy ten B-XX's and the required number of supporting KC-135's, to Clark AFB, Phillippines beginning on 1 July 1976. This deployment, code named Operation Fantasia, would be given priority IA, and was required to give the Free World forces a strategic nuclear warfare capability to stop the Chinese invasion of Thailand. Due to the ability of Offutt AFB's B-XX force to assume the EWO targets now covered by the B-XX's at Wright-Patterson AFB, all ten of the B-XX's to be deployed would come from the Wright-Patterson

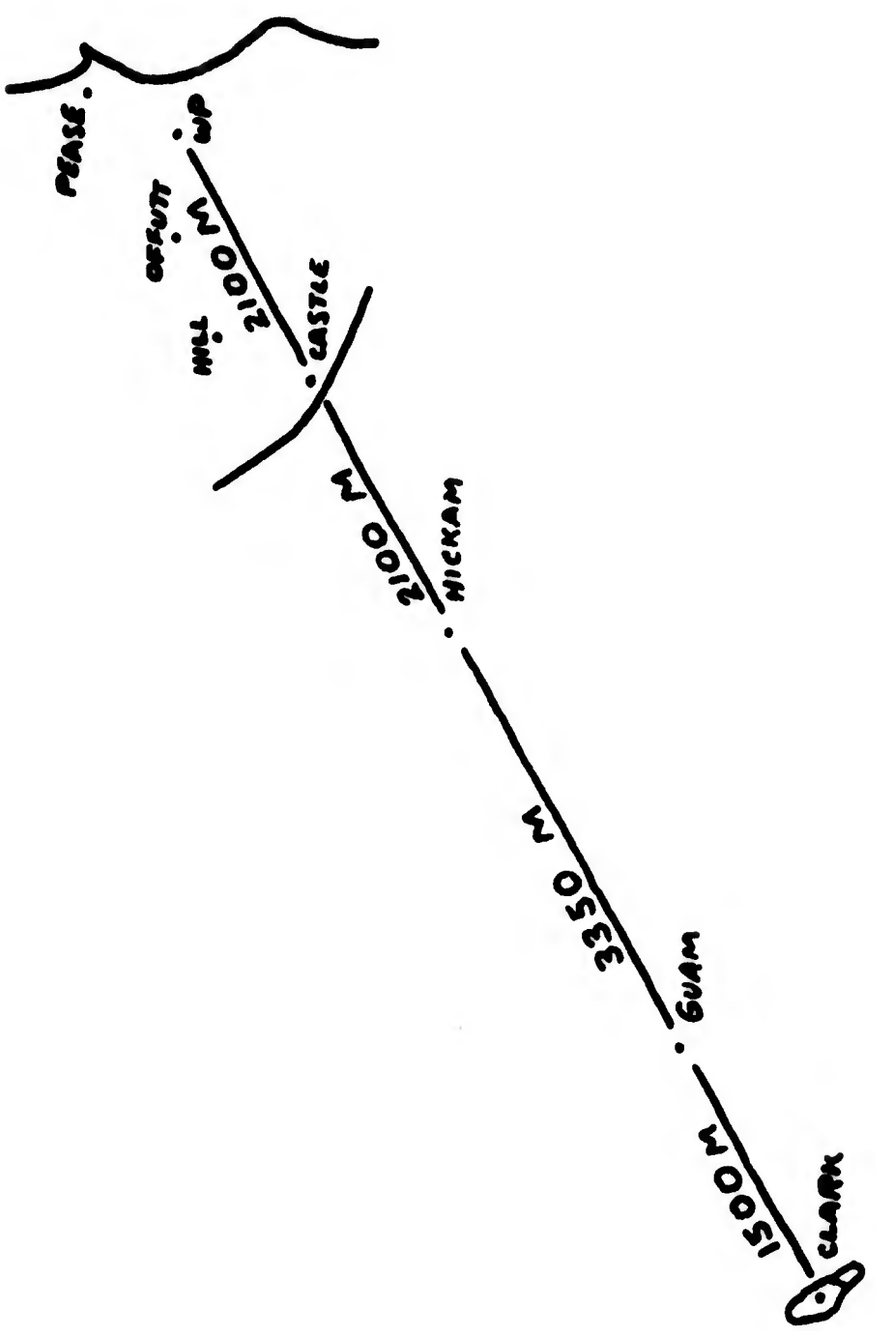
unit. The wright-Patterson unit's mission would be changed to seven B-XX's and seven KC-135's on alert, with the Offut unit increasing its alert force to thirteen bombers and thirteen tankers.

The deployment schedule will consist of one bomber every other day beginning with the first deployment on 1 July and the last deployment on 19 July. The deployment route will be as shown in attachment I and will consist of three aerial refuelings: the first over Castle AFB, the second over Hickam AFB, and the third over Guam. The fuel transferred to the B-XX during all three refuelings must amount to 72,000 pounds of JP-7. In order for the KC-135 to orbit for two hours with this much fuel, refuel the bombers, and then return, the KC-135 must be launched from a base no further from the refueling point than 1800 miles. Deployment refueling support is permitted by KC-135's from any one of the four bases (excluding the alert tankers); however, the KC-135's left at Clark AFB after the deployment is completed must originate at Wright-Patterson AFB. Additionally, each B-XX must be capable of an operational sortie (one aerial refueling) four days after arrival at Clark AFB.

All of the equipment and supplies that will be required to build up Clark AFB (in order to provide home base support for the bomber will be in place no later than 15 June at Wright-Patterson AFB. Fifteen C-141's will be provided to airlift the cargo to Clark AFB. In addition, complete JP-7 refueling capability will be present at Clark AFB by 15 June.

The operations order will be submitted to the JCS in the following format: B-XX schedule; KC-135 schedule, including point of origin, activity, and point of final landing; the C-141 schedule. Furthermore, the schedule will show the activity from the first support flight to the last support flight, and the actions taken to provide recovery support in case a B-XX has to land at an alternate base during deployment.

ATTACHMENT I



9

ATTACHMENT II

RECOVERY PACKAGES

Basic Package

Item	Quantity	Weight
Operations Officer	1	300
Maintenance Officer	1	300
Acft. Maint. Tech.	5	1,500
Electrical Tech.	2	600
Hydraulic Tech.	2	600
Instrument Tech.	2	600
Jet Engine Tech.	2	600
Arm. & Elec. Tech.	3	900
Pol. Tech.	2	600
Hi Press Air Start Cart	1	5,200
Hi Voltage Generator	1	3,000
B-XX Jacks	2	1,000
Main Land. Gear Dolly	2	1,000
Power Distribution Cart	1	800
Tires	4	800
Spare Parts Kit	1	700
Crew Chief Tool Box	2	400
B-XX Tow Bar	1	300
KC-135 to B-80 Fuel Hose	2	300
Oil Service Cart	1	300
Extra Drag Chute	1	200
TOTAL		20,000

Engine Change Package

Item	Quantity	Weight
Engine Change Dolly	1	10,000
Trailer with Engine	1	18,000
Empty Trailer	1	2,000
Spare Parts Kit	1	600
Engine Change Tool Box	1	400
	TOTAL	31,000

Hydraulic Repair Package

Item	Quantity	Weight
Hyd. Service Cart	1	8,000
Hyd. Filtering Cart	1	3,000
Hyd. Pressure Cart	1	12,000
Test Equip. Trailer	1	1,200
Spare Parts Kit	1	500
Hyd. Repair Tool Box	1	300
	TOTAL	25,000

Weapons Removal Package

Item	Quantity	Weight
Weapon Trailer	2	2,000
Bay Doors Power Unit	1	1,500
Weapon Sling	1	700
Weapon Removal Tool Box	1	300
	TOTAL	4,500

Wing Mechanism Repair Package

Item	Quantity	Weight
Mechanism Sling	1	800
Spare Mechanism	1	1,000
Mechanism Change Tool Box	1	700
Spare Parts Kit	1	500
	TOTAL	3,000

Navigation Repair Package

Item	Quantity	Weight
Bomb-Nav. Set	1	1,000
Fire Control Computer	1	500
Gyro. Package	1	300
Spare Instruments Kit	1	300
Flight Computer	1	500
Nav. Repair Tool Box	1	400
	TOTAL	3,000

Bare Base Package

Item	Quantity	Weight
Air Conditioner	2	11,000
MD3 Generator	2	6,000
Portable Heater	4	8,000
NF2 Floodlights	2	4,000
Lox Cart	2	3,000
B-4 Stands	2	1,000
	TOTAL	33,000

DIRECTION

You have been given the task of developing the operations order. This order should be submitted in the format directed by the JCS.

ANALYSIS

Statement of the problem

1. Develop an operations order for Operation Fantasia.

Pertinent Facts

1. The ten new bombers are to be deployed from Wright-Patterson AFB.

2. The take-off and landing payloads of the C-141 and the KC-135.

3. The problems encountered with the B-XX.

4. The B-XX was designed to fly 3,600 miles between refuelings.

Assumptions

1. The Chinese invasion of Thailand is a real threat.

2. The United States has a treaty with Thailand and will intervene should the Chinese invade Thailand.

3. The necessary support aircraft, equipment, and personnel will be available for this deployment. (The use of the C-5A is not contemplated in support of the B-XX mission).

4. The JCS have designated the format for the operations order.

Alternatives

1. SAC can decide not to submit an operations order.

2. SAC can submit an operations order not in the format directed by the JCS.

3. SAC can develop and submit an operations order in the format directed by the JCS.

SOLUTION

Reasoning Used

Due to the B-XX only flying operational missions from Clark AFB, each requiring only one refueling per operational sortie, full support for the ten deployed bombers can be gained from ten KC-135's. Therefore, ten B-XX's and ten KC-135's will be transferred from Wright-Patterson AFB to Clark AFB.

All of the material support positioned at Wright-Patterson AFB for transhipment to Clark AFB, except for one basic recovery package, will be deployed beginning on 16 June in six hour increments. The basic recovery package will be airlifted by KC-135 to Hickam AFB on 29 June, and then airlifted on to Clark AFB on 21 July. The KC-135 will be used for refueling support during its stay at Hickam AFB. This will provide basic recovery capability from six bases during the deployment period.

Due to the refueling radius of the KC-135, the tankers supplying the refueling support over Hickam AFB will have to be launched from Hickam. Therefore, the JP-7 fuel will have to be airlifted into Hickam, and one of the tanker's fuel transferred to five other KC-135's in order to bring them up to the required

refueling weight (60,000 pound landing weight and 72,000 pound refueling weight). The tanker from Wright-Patterson that lands at Hickam with the recovery package will also carry enough JP-7 to "top-off" the first three KC-135's. This will leave a requirement for only two more tankers to be used to "top-off" the refuelers.

The tankers operating out of Hickam, other than the one coming from Wright-Patterson, will be deployed from Offutt AFB. The KC-135's providing refueling support over Castle AFB will be launched from Castle. By scheduling their training requirements so that training flights will not be needed during the B-XX deployment, all KC-135 support can be provided by Wright-Patterson, Offutt, and Castle, thereby relieving Pease AFB from the exercise.

Since half of the bomber flights that are aborted are due to a missed aerial refueling, half of the recoveries will be expected to occur at either Castle, Hickam, or Guam. Since the B-XX can always clear the runway (one-hundred yards after a blow out), the tanker providing refueling support over Guam could land behind a landing B-XX once it cleared the runway. By placing two aircraft maintenance technicians, two jacks, two main landing gear dollies, and a tow bar on the tanker,

minor maintenance support could be provided at Guam until the arrival of the recovery package from Clark. Using this technique, a basic recovery capability will be in place half of the time it is required. With this rapid recovery capability, any bomber aborting for minor maintenance or servicing will be recovered and scheduled for relaunch on the next day. However, if a B-XX lands at an alternate base, or needs engine or hydraulic maintenance, it will be repaired as soon as possible, but its launch will be delayed until 21 July. Recovery packages, other than the basic package, will come from either Clark AFB or Castle AFB.

Schedule

The B-XX schedule will be one deployment every other day beginning on 1 July and ending on 19 July. If a major recovery is required, the recovered bomber will be relaunched on 21 July.

On 29 June the KC-135's will be positioned for the deployment. Nine tankers will be deployed from Wright-Patterson to Clark, one from Wright-Patterson to Hickam, and one from Offutt to Hickam. The Wright-Patterson tanker at Hickam will "top-off" the tanker from Offutt and then be placed on alert for a recovery.

On the day of a B-XX deployment, a KC-135 will be launched from Castle, Hickam, and Clark for refueling support. On the next day the tanker at Hickam will return to Offutt and be replaced by a KC-135 deployment from Offutt. On 6 July, and 16 July, an extra tanker will be deployed from Offutt to Hickam to be used to "top-off" the other tankers. The day after its last "top-off" the tanker will return to Offutt. On 21 July, the Wright-Patterson KC-135 at Hickam will deploy to Clark. Any recovered B-XX's will be refueled as required to complete their deployment.

The support materiel will be deployed from Wright-Patterson to Clark, beginning on 16 June, as previously outlined.

Conclusions

Although some of the recovery contingencies have not been defined, adequate planning factors have been included to enable the derivation of the solution to the contingencies. This case study was purposefully constructed in this manner in order to give the reader a number of purposes for its study. By varying the planning factors, many possible solutions can be generated. For example, the utilization of the C5A aircraft

would require an entirely new evaluation of this deployment exercise.

GUIDE

This case is primarily designed for a team project and will require three actual class periods.

1. Devote two class periods for the teams to work on their solutions.

2. The third class period should be used to discuss the various team solutions.

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1. U.S. Department of the Air Force, Strategic Aerospace Command. Logistics Planning Manual. SAC Manual 400-1. Offutt AFB, Nebraska.

2. U.S. Department of the Air Force, Strategic Aerospace Command. SAC Deployment Planning Manual. SAC Manual 400-4. Offutt AFB, Nebraska.

CASE 2

A NEW JOB AT BITDAHLEM

NOTE: This case was prepared by Lt Colonel John F. Stanhagen, Jr., a member of the graduate faculty of the School of Systems and Logistics, for use in a seminar course he conducted in Maintenance Management in the graduate program.

BRIEF: Maintenance Management is an extremely important function in the logistics process. In this case, you are required to assess the maintenance capability of an organization to which you have just been assigned.

You have been recently assigned as Chief of Maintenance for the 352nd Tactical Fighter Wing at Bitdahlem Air Base in Germany. The organization has 80 F4C aircraft, keeps 12 of them on alert, and is set up, as far as maintenance is concerned, according to AFM 66-1. At this time USAFE has no supplements to the Manual.

All of the reports in Chapters 8 (Manhour Reporting) and 9 (Maintenance Data Collection) of AFM 66-1 are available to your people through the B-3500 computer system. Your people tell you they have been getting all reports according to schedule.

You have been on site now for two weeks and your family is with you and in government quarters which are quite comfortable. You are all "checked-in" at the base and have started to come to grips with your new job.

On the surface, the Wing seems to be in generally good shape. You were favorably impressed with the initial briefings you have had from the Wing Operations Staff and the Wing Commander seems like a firm but "good" man.

Trips through and around the maintenance facility have not been very revealing. The facilities seem adequate, nobody has voiced complaints of substance, and the people all appear to be competent. In other words,

you are at an average Air Force base which has no particularly outstanding assets or liabilities. The airplanes are clean and everything is generally in its place (or seems so).

The Wing had an ORI (Operational Readiness Inspection) seven months ago and had a satisfactory rating. You have read the report and note that only the common or routine discrepancies that exist in any organization were reported about maintenance.

With some reasonable allowance for European weather, the flying hour program is on schedule (and has been for the past year) and on-time take-offs are satisfactory, abort rate is very low, sortie length is average, and OR rate is good. The NORM rate has averaged less that 20% and NORS (all categories) have been a maximum of 4% in the time since the ORI.

Your first "real" day at work was two days ago. You then asked the maintenance staff to prepare a briefing for you on labor distribution and utilization. The briefing was held yesterday afternoon and was conducted by the Chief (a Captain) of Maintenance Analysis. All of the "Chiefs" (Officers) in maintenance were at the briefing and had seen it prior to it being given to you.

The briefing was direct and to the point and centered on the previous month's operation. Several transparencies and charts were used but the substance of the briefing is contained in the attached chart (which was given to you by the Captain in Maintenance Analysis).

This morning the Wing Commander called and asked how you were. He also wanted to know what specific actions you intended to take or direct as a result of yesterday's briefing and the time you have been on the job (you told him about the briefing). He asked you to be in his office in two hours with a summary of these actions (and a rationale for each), comments on your general impressions of the Maintenance Organization, and your assessment of maintenance capability along with your calculation method for making that determination. (At this point you are no longer so sure he is a "good" guy.)

Please prepare what you will say to him (you may assume he will ask no questions or interrupt until you are finished).

352nd TFW Manhour Distribution and Utilization Summary -- November 1970

WORK CENTER	LABOR CODE GROUPS						FROM MAINTENANCE DATA
	Productive Direct Labor (Codes 100-199)		Productive Indirect Labor (Codes 300-399)		Production Delay, Duty and Non - Duty Absence (Codes 500-999)		
	Assigned Manhours	Available Manhours	Assigned Manhours	Available Manhours	Assigned Manhours	Available Manhours	DIRECT PRODUCTIVE HOURS (TOTAL)
Chief of Maint. 11---	0	189	33,735	32,658	0	3,292	125
Organ'l Maint. 12---	60,718	33,109	4,903	23,031	0	8,040	31,449
Field Maint. 13---	66,056	35,392	3,537	27,762	0	6,331	34,170
Avionics Maint. 14---	51,086	30,628	10,452	19,963	0	11,127	25,772
Munitions Maint. 15---	31,680	23,326	10,984	14,976	0	4,899	23,370
WING	209,540	122,644	63,611	123,390	0	33,689	114,886

Total flying hours (F4C) in November: 2,276

PRODUCTIVE DIRECT LABOR CODES 100-199.

Productive direct labor codes identify manhours expended on items of equipment, alert duty, operation monitoring, maintenance TDY and plant equipment maintenance.

PRODUCTIVE INDIRECT LABOR CODES 300-399.

Productive indirect labor codes identify manhours expended in support of or controlling the maintenance activity. This category includes manhours expended in management and supervision, maintenance administration, base technical training and records keeping, tasks performed by staff agencies of the Chief of Maintenance, maintenance meetings, transportation vehicle operation, and travel time to and from the job when manhours spent in transit exceed five-tenths of an hour (travel time which takes five-tenths of an hour or less will be charged to the job).

DUTY ABSENCE LABOR CODES 700-799.

Duty absence labor codes identify manhours absent from maintenance but present for duty or on non-maintenance TDY. This category includes manhours expended for military training, personnel inspections, commander's call, squadron or base duties, athletic programs, and personnel processing

NONDUTY ABSENCE CODES 900-999.

Nonduty absence codes identify manhours expended by individuals who are not present for duty and are not on TDY. This category includes manhours expended for leave, compensatory time off for overtime, excused from duty (VOCO, passes, etc.), medical absences, personal affairs, AWOL or confinement and tardiness.

PRODUCTION DELAY CODES 500-599.

Production delay codes identify manhours expended awaiting assistance, transportation, weather, equipment, facilities and parts.

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13. ABSTRACT

The role of the logistics manager assumes significantly great importance in these crucial times when our nation is confronted with many critical problem areas -- domestic as well as foreign. With an increasingly greater proportion of the dollars historically allotted to the defense budget in years past being reallocated to meet the pressing socio-economic demands of contemporary society, it is imperative that military executives judiciously manage the vast resources entrusted to them to meet our national objectives.

Since the increasing complexities of modern management systems require a level of expertise that can rarely be built within the work setting itself, knowledge obtained through training and education must supplement and support skills gained through work and experience. A particularly effective means of developing managerial skills and enhancing decision-making capabilities is through the case method of teaching.

Thus, a series of case studies have been developed to facilitate understanding of the functional areas of logistics -- requirements determination, acquisition, distribution, and maintenance. This particular document is concerned with the maintenance function -- the continued support of that which has been acquired and distributed -- and includes a set of five cases which may be used to develop and enhance the skills and knowledge of the logistics manager.

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Security Classification

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	ROLE	WT	ROLE	WT	ROLE	WT
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Case method of instruction						
Case studies in logistics						
Logistics						
Logistics cases						
Logistics management						
Management of logistics						
Management of resources						
Maintenance function of logistics						
Maintenance management						
Resources management						

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