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# AMC HISTORICAL STUDIES

## THE CONCEPT OF PROJECT MANAGEMENT

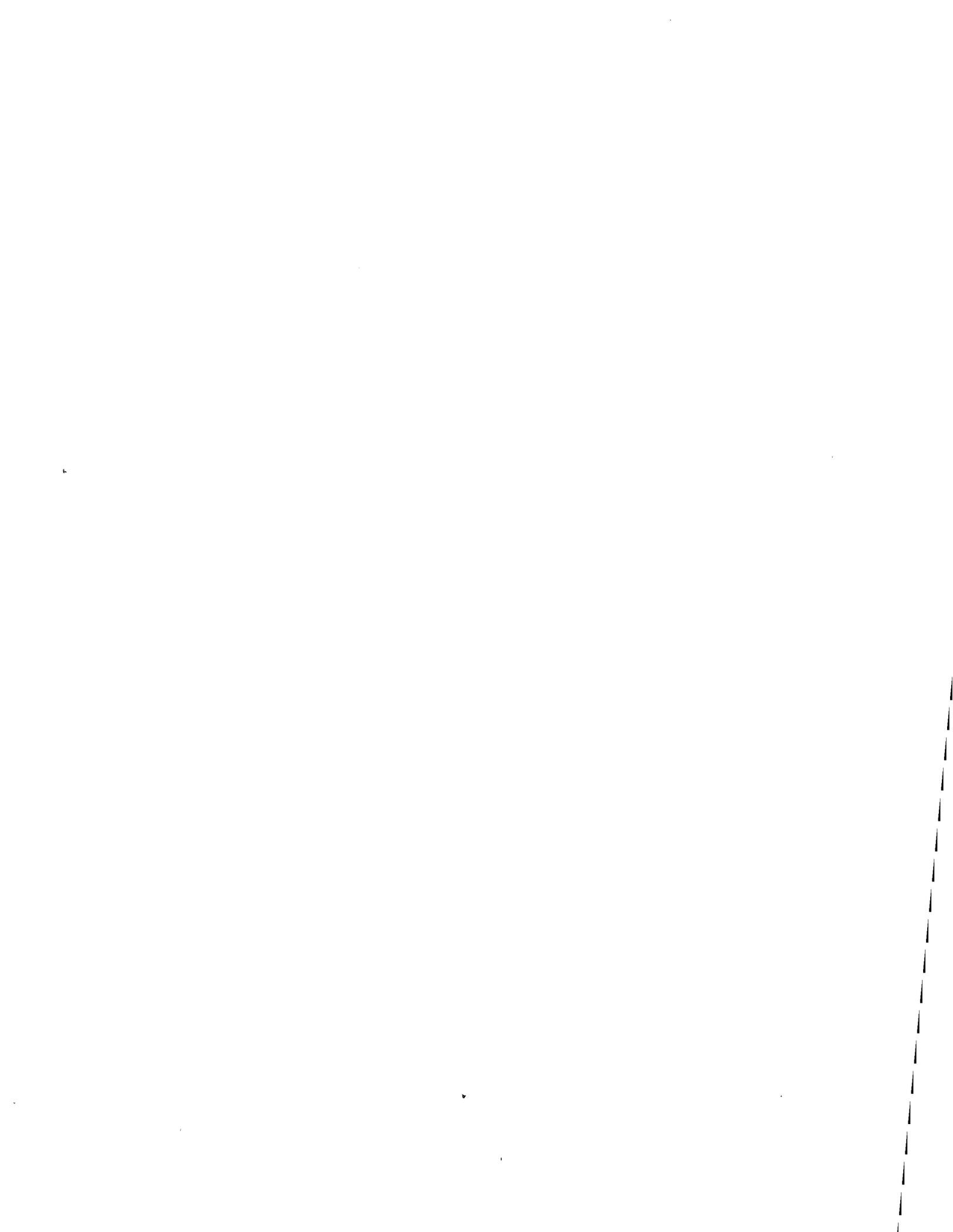
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**HISTORICAL OFFICE  
U.S. ARMY MATERIEL COMMAND  
WASHINGTON, D. C.**



THE CONCEPT  
OF  
PROJECT MANAGEMENT

by  
Raymond J. Snodgrass

AMC HISTORICAL STUDIES  
NO. 1

HISTORICAL OFFICE  
U. S. ARMY MATERIEL COMMAND  
Washington, D. C., 1964



## Preface

In the decade preceding the reorganization of the Army in 1962, the technical services had established various policies and procedures for managing weapon systems. All of the armed services had practiced project management in some form. Thus the concept of project management was evolutionary rather than revolutionary.

When the Army Materiel Command was established, it gave this concept the widest application of all the armed services. This study briefly traces the evolution of project management from the Manhattan Project in World War II. The major emphasis, however, is on the development of policies and procedures for its operation in the AMC from 1962 through June 1964. Both the successful application of project management and the problems involved in it are covered.

This study is intended to provide an overall history of the concept of project management rather than a detailed description of its application to each individual project-managed weapon system in the AMC. Consequently, few technical details of such systems are given, except to illustrate their complexity. However, typical, as well as unusual, examples of the concept's application within the AMC are covered.

The most important collection of documents used in the preparation of this study was in the Office of the Special Assistant for Project Management at Headquarters, AMC. The Project Management

Branch of the Review and Analysis Division in the Office of the Comptroller and Director of Programs and the various project managers' offices were a source of a considerable amount of supplementary material. The Special Projects Office of the Department of the Navy provided reference material on the Polaris missile project. The files in the Office of the Assistant Secretary of Defense (Installations and Logistics) yielded much early background material on project management, including records on the Robertson Report of 1956 and the Davis Committee Study of 1961. Much of the material on weapon systems management in the former Technical Services come from the files of two of these Services-- The Ordnance Corps and the Transportation Corps.

The author wishes to thank Dr. Erna Risch, Chief of the AMC Historical Office, for her constructive criticism of the entire manuscript, and Colonel John M. Christensen, Jr., the first Special Assistant for Project Management and his successor, Colonel James L. Lewis, for their valuable comments.

Washington, D. C.

Raymond J. Snodgrass

30 June 1964

## CONTENTS

<u>Chapter</u>	<u>Page</u>
I. DEMAND FOR BETTER MANAGEMENT . . . . .	1
Factors Demanding Better Management . . . . .	2
Changing Nature of Warfare . . . . .	2
Complex Weapon Systems . . . . .	5
Large Defense Budget . . . . .	7
Lead Time and Obsolescence . . . . .	11
Significant Trends and Developments . . . . .	13
Outmoded Technical Service Organization . . . . .	15
II. PREVIOUS EXPERIENCE WITH SPECIAL MANAGEMENT	
TECHNIQUES . . . . .	27
Wide Variety of Management Techniques . . . . .	27
In Government Agencies . . . . .	27
In Industry . . . . .	29
The Program Package Concept . . . . .	31
The Manhattan Project . . . . .	37
The Achievement . . . . .	40
Reasons for Success . . . . .	42
The Navy's Polaris Project . . . . .	44
Comparison with Army and Air Force	
Projects . . . . .	44
Special Projects Office . . . . .	46
Highlights of Raborn's Plan . . . . .	50
The Army's Jupiter Program . . . . .	52
The Army Ballistic Missile Agency . . . . .	52
Highlights of Medaris' Plan . . . . .	56
The USAF Ballistic Missile Program . . . . .	60
The von Neumann Committee . . . . .	60
The Ballistic Missile Division . . . . .	61
Principles of Air Force Systems Management . . . . .	64
III. WEAPON SYSTEMS MANAGEMENT IN THE TECHNICAL	
SERVICES . . . . .	67
Weapon Systems Management in the Ordnance Corps. . . . .	69
Weapon Systems Management in the Transportation	
Corps . . . . .	80
The Chemical Corps' Weapon Systems Management	
Plan . . . . .	86
Project Management in the Army Technical Services . . . . .	89

IV.	PLANNING FOR PROJECT MANAGEMENT IN THE AMC . . . . .	97
	The Defense Management Picture in 1961 . . . . .	97
	Background Observations . . . . .	97
	The Robertson Report . . . . .	100
	The Davis Committee Study . . . . .	102
	Early Views on the AMC Project Manager Concept . . . . .	108
	The Hoelscher Report . . . . .	108
	MDLC Preliminary Implementation Plan . . . . .	111
	Contribution of United Research Incorporated . . . . .	113
	Role of AMETA . . . . .	120
	The AMC Activation Plan . . . . .	126
	Training School for Project Managers . . . . .	128
V.	SCOPE AND OPERATION . . . . .	133
	Scope of Project Management in AMC . . . . .	133
	Types of Projects . . . . .	134
	Activation, Termination, and Location . . . . .	138
	Project Management in Operation . . . . .	142
	Overall Direction and Control . . . . .	142
	Red-Line Reporting . . . . .	150
	Project Management Funds . . . . .	152
	Special Assistant for Project Management . . . . .	155
	DASSO's . . . . .	156
	Specific Applications. . . . .	163
	Iroquois . . . . .	164
	Chinook . . . . .	166
	Caribou . . . . .	167
	CCIS-70 . . . . .	169
	SATCOM . . . . .	171
	Special Warfare . . . . .	173
	Main Battle Tank . . . . .	174
	General Application . . . . .	176
VI.	PROJECT MANAGEMENT PERSONNEL . . . . .	179
	Staffing Project Manager Offices . . . . .	179
	Initial Staffing . . . . .	179
	Personnel Requirements and Strength . . . . .	181
	Civilian Career Program . . . . .	189
	The Problem . . . . .	189
	The Solution . . . . .	190
	Project Manager Qualifications . . . . .	198
	Replacement of Project Managers . . . . .	203
	Defense-Wide Training . . . . .	205

<u>Chapter</u>	<u>Page</u>
VII. IMPACT AND IMPLICATIONS . . . . .	213
Overall Perspective . . . . .	213
Degree of Success Achieved . . . . .	213
Problem Areas . . . . .	214
Number of Project Managers . . . . .	216
Impact on Manpower . . . . .	220
Contrasting Views . . . . .	221
Case Studies . . . . .	224
Summary of Personnel Impact . . . . .	228
Relations with SMC . . . . .	229
Problems with Functional Elements . . . . .	231
Studies and Surveys . . . . .	232
Evaluation . . . . .	236
INDEX . . . . .	239

Tables

<u>No.</u>	<u>Page</u>
1. U. S. Army Materiel Command Project Managers' Offices, 1 August 1962- 1 April 1964 . . . . .	140
2. Personnel Authorization in Project Managers' Offices, 31 December 1963 . . . . .	185



CHAPTER I  
DEMAND FOR BETTER MANAGEMENT

On 6 November 1962, the Army Materiel Command (AMC) terminated the Project Manager's Office for the Field Army Ballistic Defense Missile System (FABMDS) and the Department of the Army re-oriented this project.<sup>1</sup> The project had been placed under a project manager in August 1962.<sup>2</sup> Under the functional control type of organization, each separate organizational segment in charge of a part of the weapon system had justified its portion of the required budget. When the project manager assumed responsibility and brought together all of the facts, such as the overall cost, the technical problems involved, and the long lead time required, the Department of the Army decided to re-orient the project.<sup>3</sup> Under the new AMC management concept, the project manager had complete control of a weapon system from "the cradle to the grave."<sup>4</sup> Although some aspects of the AMC project management

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<sup>1</sup> Ltr, Chief, Org and Systems Gp, DCSLOG, to CG, AMC, 6 Nov 62, sub: Termination of Project Managership for FABMDS.

<sup>2</sup> Joint Messageform, CG, AMC, to Proj Mgr, FABMDS, Hq, AMC and Info copy to all subordinate commands, 1 Aug 62, sub: FABMDS Charter.

<sup>3</sup> Intvw, Author with Col Robert R. Lutz, FABMDS Proj Mgr, 5 Nov 62.

<sup>4</sup> AMC Planning Directive 24, 12 Jun 62, sub: AMC Concept of Proj Mgt.

system were revolutionary, the general idea of item- or system-oriented management had developed through an evolutionary process over a period of years.

### Factors Demanding Better Management

#### Changing Nature of Warfare

Contributing to this evolution were the changes in warfare itself, particularly the technological changes of the last decade and a half. Progress in electronics had practically eliminated the carrier pigeons. Mechanization finally had led to the elimination of the Army mule in February 1957, when the last of the pack mules was sold at Fort Carson, Colorado. Horses had long ago disappeared from the field of battle. Only the intervention of General George C. Marshall and President Eisenhower saved the Fort Myer horses used in traditional military funerals despite the findings of a survey that showed horse-drawn vehicles to be considerably more expensive than motorized hearses.<sup>5</sup> The development and introduction of complex weapons, capable of performing against close or distant targets, and under all kinds of conditions, had

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- <sup>5</sup>(1) The (Washington, D. C.) Evening Star, Feb. 14, 1957.  
(2) The Washington Post, Feb. 20, 1957.

the greatest impact on the changing nature of warfare.

That conventional weapons would still be necessary, although nuclear weapons were available, was indicated by the Korean War and the more than twenty smaller conflicts following World War II. Nevertheless, with respect to the nature of warfare, the idea of massive retaliation, a doctrine adhered to by the U. S. Air Force, had grown up in the United States after World War II. In the words of Secretary of State John Foster Dulles in January 1954, the United States had "a great capacity to retaliate, instantly, by means and at places of our own choosing."<sup>7</sup>

By 1957, however, some military leaders, scholars and statesmen had expressed the belief that too much attention had been given to the massive retaliation idea. During that year, Dr. Henry Kissinger of Harvard University had advanced the notion that limited war might be more rational.<sup>8</sup> Secretary Dulles, in 1957, wrote: "In

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For a comprehensive discussion of the changing requirements in weapons, see Merton J. Peck and Frederic M. Scherer, The Weapons Acquisition Process: An Economic Analysis (Boston, 1962).

<sup>7</sup> Speech, John Foster Dulles before Council of Foreign Relations, N. Y., 12 Jan 54. See Keesing's Contemporary Archives, vol. 9, (1952-54), p. 13361.

<sup>8</sup> (1) See Henry A. Kissinger, Atomic Weapons and Foreign policy, (New York, 1957). (2) See also, Robert Endicott Osgood, Limited War: The Challenge to American Strategy, (Chicago, 1957).

the future it may thus be feasible to place less reliance upon deterrence of vast retaliatory power."<sup>9</sup>

Preparation for waging non-nuclear limited war was the objective of many of the changes proposed by Secretary of Defense Robert S. McNamara in his first defense budget in 1961. During the hearings on that budget, a member of the Senate Armed Services Committee expressed the view that the Communist world would not dare "bite" with its nuclear strategic power, but rather it would "nibble" with its tactical forces around the free world perimeter. While admitting that the United States should be capable of massive retaliation, Secretary McNamara maintained that the Nation should not be forced to use that power simply because it had no other means to cope with limited conflicts.<sup>10</sup>

It was almost certain that the United States would not use unlimited means to fight a war if the aims were limited, as they were in the Korean War, in which case the Nation would have to be able to fight a successful war without nuclear weapons. The Department of Defense, however, did not neglect the development of new weapons, guided by intricate electronic devices and capable of carrying

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<sup>9</sup> John Foster Dulles, "Challenge and Response in United States Policy," Foreign Affairs, vol. 36 (October 1957), pp. 25 - 43.

<sup>10</sup> Lt Cmdr Robert J. Massey, USN, "The First Hundred Days of the New Frontier," in United States Naval Institute Procedures, vol. 87, (1961), pp. 27 - 29.

nuclear warheads with explosive power equivalent to thousands of  
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tons of TNT.

The tremendous destructive power of these new weapons in this era of rapid technological advancement dictated revolutionary changes in military tactics and in the system of logistical support for the combat forces. The Army Materiel Command keyed its material and human resources to a long-range program with emphasis on new type weapons. The changing nature of weapon systems, their increased complexity and phenomenal costs produced inevitable managerial adjustments.<sup>12</sup> Furthermore, the experience in past wars made it abundantly clear that better preparation would be essential in any future war.

#### Complex Weapon Systems

As manifested by the development of guided missiles, supersonic aircraft, atomic weapons, and complex electronics equipment, the 1945 - 1960 period was an era of technological revolution in weaponry. This revolution in technology after the end of World

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<sup>11</sup> For further information on the changing nature of warfare, see presentations by Secretary of Defense Charles E. Wilson and Secretary of the Army Wilbur M. Brucker, and others, before the House of Representatives, Committee on Armed Services, 28 January 1957.

<sup>12</sup> See, "Barbs Come from Congress, Military," Missiles and Rockets, vol. 12 (March 1963), pp. 66 - 68. This article deals with the changing nature of weapon systems and their management.

War II had profound effect on the character of the military program. The technical complexity of modern weapons, their lengthy period of development, and their enormous costs posed tremendous management problems. Around the key decisions on these problems  
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much of the Defense program revolved.

Of all weapon systems, the guided missile was the most complex and difficult to design and build. Its components included electronic mechanisms, proximity and other complex fuzes, nuclear warheads and high energy fuels. Missile technology involved such physical sciences as aerodynamics, gyrostatics, heat transfer, metallurgy, propulsion, servomechanisms, telemetry, thermodynamics, and chemistry. Much of the work represented new advances in the field rather than existing achievements.

The highly complex assemblies of some intricate guided missile mechanisms consisted of as many as 300,000 separate parts. These weapons had complicated fuel systems, intricate electronic guidance devices, and were capable of attaining supersonic velocities. The Nike Zeus, for example, employed sophisticated acquisition and discrimination radars and had three high-speed computer systems. Its acquisition system could scan thousands of cubic miles

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For an enlightening discussion of the results of the revolution of military technology, see Charles J. Hitch and Roland L. McKean, The Economics of Defense in the Nuclear Age (Harvard University Press, Cambridge, 1960).

of space. Its radar could present information on a large number of targets at once. It furnished continuous, precise trajectory data to the computers to determine the point of target interception. The discrimination radar was designed to distinguish between valid warheads and false targets or decoys. The Nike Zeus was designed to operate automatically from acquisition of the target to interception and to engage a number of targets simultaneously. Zeus missiles fired from Kwajalein Island in the mid-Pacific successfully intercepted target nose cones launched over the Pacific with ICBM boosters from California. By June 1963, a total of approximately \$1.4 billion had been allocated for the development of the Nike Zeus.<sup>14</sup> In addition to the prime contractor, 139 subcontractors, with contracts in excess of \$100,000, hundreds of smaller contractors, and numerous government agencies participated in this missile program.<sup>15</sup>

#### Large Defense Budget

On 4 October 1957, Russia launched its 185-pound Sputnik I, the first artificial earth satellite ever put into orbit. This

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<sup>14</sup> Fact Sheet, Nike Zeus Anti-missile Missile System, prepared by AMC Information Office, Mar 1963.

<sup>15</sup> Information furnished by Nike Zeus PMSO, Hqs, AMC, 18 Dec 63.

event caused considerable alarm in the United States, and led to much speculation by the general public about Russian technological advancement. The President, in his State of the Union address on 9 January 1958, declared that the threat to the safety of the Nation had become increasingly perilous and that the military establishment must be equipped with the most modern weapons. Furthermore, the 85th Congress voted an appreciable supplemental defense appropriation after the launching of Sputnik I. With the passage of the Department of Defense Appropriation Act of Fiscal Year 1958, the congressional appropriation committee declared that so long as unsettled world conditions prevailed a defense program calling for high expenditures would have to be continued. On the other hand, the committees were of the opinion that the military services should make constant reviews, looking toward better management.<sup>16</sup>

The unsettled world conditions, the increased complexity of weapon systems, and the emphasis on better preparedness to cope with any possible threat from a potential enemy resulted in an expenditure of approximately \$15 billion a year for weapons during the post-Korean period. The existing Department of the Army organization was not suitable for handling the large weapon system programs involving phenomenal sums of money. Defense expenditures became a

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(1) 71 Stat. 312 (1957). (2) House Doc. 371, 85th Cong., 2nd sess., April 16, 1958, pp. 1-12.

major portion of the entire Federal budget.<sup>17</sup>

When compared with Federal budgets in the earlier periods of American history, these more recent expenditures were phenomenal. For example, during the entire period of 1789-1849, the total Federal expenditure amounted to slightly over \$1 billion. In the next half century, from 1850-1900, the budget totaled approximately \$15 billion. In contrast, the Federal budget for Fiscal Year 1964 was nearly \$100 billion, of which \$51.3 billion were earmarked for the Department of Defense. A considerable portion of the large annual defense budget was expended for guided missiles, electronic control systems, and other complex weapon systems.<sup>18</sup> Near the beginning of his first term of office, President Eisenhower dramatized the tremendous cost of weapons by pointing out that the money spent for one heavy bombardment aircraft would build a modern brick school in more than 30 cities; that it would build two electric power plants, each serving a town of 60,000 people; that it would buy two fully equipped

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<sup>17</sup> (1) House Doc. No. 15, 88th Cong., 1st sess., The Budget of the U. S. Government, FY 1964 (GPO, 1963), p. 422. (2) For a discussion on managing complex weapon systems, see Working Paper, Study of Army Functions, Organization and Procedures, OSD Project 80 (Army), 10 July 1961, sub: Case Study - Mohawk Aircraft System.

<sup>18</sup> House Doc. No. 15, 88th Cong., 1st sess., The Budget of the U. S. Government, FY 1964, p. 422.

hospitals; and that it would build 50 miles of concrete highway.<sup>19</sup>

In his message to the Congress on the Fiscal Year 1964 budget, President Kennedy warned that the government would continue its scrutiny and criticism of its efficiency. Although he stated that there was "no discount price on defense," the President called attention to his policies which demanded continued emphasis on better management and more efficient performance.<sup>20</sup>

Soon after President Kennedy's first budget message, Secretary McNamara took steps toward improved management, including the initiation of a form of project management. One reason that the efficient use of military resources was a special problem was the absence of any built-in mechanisms, like those in private industry, which led to increased efficiency. Private firms are under pressure to seek profitable innovations and efficient methods. At the direction of Secretary McNamara, the Department of the Army sought to improve management by reorganizing its decision-making apparatus and introducing better evaluation review techniques.<sup>21</sup>

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<sup>19</sup> Address, "The Chance for Peace," reprinted in The Department of State Bulletin, April 27, 1953, cited in Hitch and McKean, The Economics of Defense in the Nuclear Age, p. 4.

<sup>20</sup> House Doc. No. 15, 88th Cong., 1st sess., The Budget of the U. S. Government, FY 1964, pp. 7 - 34.

<sup>21</sup> See, Hitch and McKean, The Economics of Defense in the Nuclear Age, pp. 105 - 07.

## Lead Time and Obsolescence

According to Lt. Gen. Arthur G. Trudeau, former Chief of Research and Development, Department of the Army, the lead time in the United States from weapon concept to operational availability was approximately 10 years, while in Russia the overall lead time averaged  $5\frac{1}{2}$  years.<sup>22</sup> In the post-World War II period, the armed services were gravely concerned about the long lead time. So much time was, in fact, consumed in developing and producing a weapon that the latter frequently was no longer sufficiently timely to be of great value when it became operationally available. In consequence, the weapon system project was cancelled after millions of dollars had been spent on it. In some instances, the researcher's jest: "If it works, it's obsolete," was pretty nearly true.<sup>23</sup>

Obsolescence occurred through the normal evolution of the technology on which a weapon was based, or it came because of a new weapon produced by a new and different technology. The rate of obsolescence was speeded up in the post-World War II period. A Stanford Research Institute study of the life cycle of household appliances, which were less complicated than modern weapon systems,

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<sup>22</sup> Peck and Scherer, The Weapons Acquisition Process: An Economic Analysis, p. 425.

<sup>23</sup> House Report No. 574, 87th Cong., 1st sess. June 23, 1961, DOD Appropriation Bill, FY 1962, pp. 1 - 3.

showed that the period from the time they were introduced until their sales began to decline dropped from 34 years before 1920 to an average of 8 years in the postwar period. Thus, long lead time, which contributed to obsolescence, became a problem.<sup>24</sup>

A Rockefeller report on the military aspects of international security concluded that one of the major weaknesses of the United States in strategic posture had been the inordinately long lead time.<sup>25</sup> Unlike this country's seemingly endless chain of command in the development process, Russia vested unequivocal authority in a single senior designer who became the undisputed technical manager of the project, with a great deal of flexibility and decision-making power. The Soviet leadership believed that, at least in the key projects, it should trust its leading designers to make the right decisions unhampered by bureaucratic red tape.<sup>26</sup>

Weapon development in the United States was characterized by elements of uncertainty resulting from the combination of the extent to which weapons pressed the existing limits of the engineering art

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<sup>24</sup> Donald W. Collier, "A Civilian Looks at Government-Sponsored R&D," Armed Forces Management, vol. 10, (January 1964), pp. 29, 32.

<sup>25</sup> Rockefeller Brothers Fund, Special Studies Report II: International Security -- Military Aspects (New York, 1958), pp. 6 - 13.

<sup>26</sup> Peck and Scherer, The Weapon Acquisition Process: An Economic Analysis, pp. 6 - 7.

and scientific knowledge, and the character of the demand for weapons in a cold war environment. The better performance of commercial developments in usually staying within budgets, meeting schedules, and achieving performance objectives may be explained by the fact that most commercial products did not push the state of the art and that most marketing uncertainties had been resolved before the product was developed. The weapon development and procurement system, before the introduction of the project manager concept, was the product of an evolutionary process in which government and industry participated.<sup>27</sup>

### Significant Trends and Developments

On the Department of Defense level, two reports, the Gaither report of 1957 and the Rockefeller report of 1958, identified areas of weakness and advanced several broad principles to be used as guides for defense organizational changes. The Gaither panel, set up to advise the President on certain aspects of defense, surveyed the spectacular Russian military and technological advances and gave what it believed to be the required response by the United States.<sup>28</sup>

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<sup>27</sup> Ibid., pp. 8 - 10.

<sup>28</sup> Report to the President the Security Resources Panel of the ODM Science Advisory Committee, Nov. 7, 1957. Copy in NSC Liaison Office, OCS, DA. Rowan Gaither of the Ford Foundation headed the panel.

Although the President refused to release this report to Congress on the basis that it involved a basic precedent concerning the secrecy of private communications,<sup>29</sup> its contents received much publicity in the newspapers and through congressional committees.

The Rockefeller report asserted that the roles and missions assigned to the military services were out of accord with weapon technology and the principal military threats to national safety. The report concluded that the United States was rapidly losing its lead in military technology and that corrective steps should be taken immediately at whatever cost was necessary. Furthermore, the Rockefeller report pointed out major shortcomings, such as inadequate dispersion of the retaliatory force and lack of mobility and versatility for limited war, and recommended organizational changes in the Department of Defense to correct inefficiency and duplication caused by interservice rivalry.<sup>30</sup>

The Department of Defense Reorganization Act of 1958, which provided for unified direction and control by the Secretary of Defense and for unified combat forces, integrated into an efficient team of land, naval and air forces, was patterned after the

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<sup>29</sup> Ltr, Dwight D. Eisenhower to Sen. Lyndon Johnson, 22 Jan 58. Copy of Congressional Quarterly No. 5 (31 Jan. 58), p. 137.

<sup>30</sup> Rockefeller Brothers Fund, Special Studies Report II: International Security -- Military Aspects, pp. 27 - 35.

recommendations of the Rockefeller and Gaither reports. Basically, the purpose of the law was to clarify the chain of command over military operations, clarify the duties of the Joint Chiefs of Staff, and to prevent duplication in research and engineering by creating the position of Director of Research and Engineering under the direct control of the Secretary of Defense.<sup>31</sup>

#### Outmoded Technical Service Organization

The Department of the Army commodity-oriented technical service organization came under attacks by critics for methods used in managing the development and production of complex weapon systems. Divided responsibility complicated the management, and the funding procedures resulted in fragmentation of the programs.<sup>32</sup> The diversity and complexity of Army materiel outgrew the scope of individual technical service responsibilities. According to the Hoelscher Report,

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<sup>31</sup>(1) 72 Stat. 514 (1958). (2) House Doc. 371, 85th Cong., 2nd sess., April 16, 1958, DOD Reorganization Bill of 1958, pp. 4 - 6. (3) Hearings, DOD Reorganization Act of 1958, Committee on Armed Services, U. S. Senate, 85th Cong., 2nd sess., pp. 218 - 233. (4) For further information on the DOD Reorganization Act of 1958, see Hearings, HR, 85th Cong., 2nd sess., April-May 1958.

<sup>32</sup>Report, L. W. Hoelscher to SA, 5 Oct 61, sub: Study of Army Functions, Organization and Procedures, OSD Project 80 (Army) pt. IV, vol. I, p. IV-10. Hereafter briefly cited as the Hoelscher Report.

some form of weapons management, which cut across normal organizational lines, had to be provided.<sup>33</sup>

The Hoelscher Report made numerous references to the deficiencies of the various reporting and control systems in the technical services and the delay in providing information for decisions at higher echelons. One of the major purposes for reorganizing the Department of the Army was to streamline the decision-making process. Some of the management concepts practiced by the technical services, such as the mid-management philosophy adopted by the Ordnance Corps, interposed an additional staff level in the management structure and ran counter to the necessity for streamlining the decision-making process.<sup>34</sup>

During World War II, the Ordnance Corps had created specialized centers and made them responsible for the development, production and supply of designated major items. For example, the Office, Chief of Ordnance - Detroit had the responsibility for all tank-automotive vehicles and equipment.<sup>35</sup> Again during the Korean War period the Corps established field commands and gave them responsibility for

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<sup>33</sup> Ibid.

<sup>34</sup> Memo, Maj Gen F. S. Besson, Jr., for Director, DARPO, 1 Mar 62, sub: Basic MDLC Responsibilities.

<sup>35</sup> See, Lt Gen Levin H. Campbell, Jr., The Ordnance-Industry Team (New York, 1946), pp. 37, 56 - 58, for the views of a former Chief of Ordnance on the establishment of special commodity centers.

research and development, procurement and production, stock control, and maintenance of designated major items of equipment. For example, in 1954 the Corps established the Ordnance Ammunition Command and the Ordnance Tank-Automotive Command and made them responsible for all ammunition and tank-automotive equipment.<sup>36</sup> In the following year, after a study conducted by a group of management consultants had crystallized the idea, the Chief of Ordnance established the Ordnance Weapons Command in which he centralized the responsibility for the development, procurement, and supply of all artillery and small arms weapons.<sup>37</sup> On 1 February 1956, the Army Ballistic Missile Agency, which became a part of the Army Ordnance Missile Command in 1958,<sup>38</sup> became operational. All of these mid-management commands remained in operation until they were absorbed by the Army Materiel Command in 1962.

According to the Preliminary Implementation Plan for the new Materiel Development and Logistics Command, later renamed the Army Materiel Command (AMC), one of the conditions that justified special

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<sup>36</sup>

Ord Corps Order 9-54, 23 Apr 54, sub: Organization of the Ord Corps -- Operating Control of Ord Class II Installations and Activities.

<sup>37</sup>

Booz, Allen & Hamilton, Management Consultants, "Organization of the Weapons Groups," 27 Jul 54.

<sup>38</sup>

(1) DA GO 12, 28 Mar 58. (2) Ord Corps Order 16-58, 1 Jul 58.

management was the complexity of weapon systems which required participation to an unusual degree by two or more commodity commands.<sup>39</sup> This plan for the new command envisaged a more centralized form of control than that in the existing Ordnance mid-management arrangement. Some of the planners, however, criticized the proposed plan for project managers because it removed mid-management review and authority. But the proposed plan was in line with the trend toward centralization and was consistent with the philosophy of control held by Lt. Gen. F. S. Besson, Jr., who was appointed Commanding General of the new command on 2 April 1962.<sup>40</sup>

In its analysis of the existing organization and management structure, the Hoelscher Report stated that the purpose of the creation of the Deputy Chief of Staff for Logistics, in 1954, had been to combine the seven technical services into an integrated logistical system "in place of seven autonomies." In actual fact, however, the DCSLOG exercised something less than full command over the technical services. Nowhere in his assigned functions was the word "command" actually used. Furthermore, the direction and control of research and development activities were progressively assigned to

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<sup>39</sup> MDLC Preliminary Implementation Plan, 27 Apr 62, p. I-2.

<sup>40</sup> (1) DA SO 75, 2 Apr 62. (2) Memo Lt Gen F. S. Besson, Jr., for CS, DA, 3 Aug 62, sub: Project Managers in AMC.

the Chief of Research and Development. In the procurement area, the DCSLOG maintained a staff of approximately 120 people and at the same time there were 474 in the procurement staffs of the technical services. The chiefs of the technical services and the DCSLOG exercised duplicating control over procurement operations in the field.<sup>41</sup>

Neither the DCSLOG nor any other general staff agency was assigned a true command role over the technical services. The degree of control exercised by any Army staff agencies represented a compromise solution to the overall management problems that were inherent in the seven autonomous technical services. The extent of direction and control exercised by the DCSLOG varied greatly in different functional areas. In some areas, it involved detailed operational matters. In others, it had practically no control. In general, the control exercised by the DCSLOG centered around the supply management area rather than the total operations of the technical services.<sup>42</sup>

The DCSLOG did not have the authority to carry out the mandate given to him of combining the seven technical services into one integrated logistic system in the place of seven autonomies. The relationship of the DCSLOG to the technical services fragmented responsibilities and imposed two echelons of command over the operating

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<sup>41</sup> Hoelscher Report, pt. IV, vol. II, pp. IV-211, IV-212.

<sup>42</sup> Ibid., pp. IV, 214, IV-215.

field agencies, with duplication of functions and staffing. The assignment of responsibilities to the Chief of Research and Development as well as to the DCSLOG precluded the integration of effort in the materiel area.<sup>43</sup>

In their review of the Hoelscher Report in December 1961, a select group of senior officers of the Army staff concluded that the Department of the Army's materiel structure lacked cohesiveness largely because of the technical service organizations. The group pointed out that in two world wars it had been necessary to create a more centralized control of the materiel organization after hostilities had begun. More recent attempts to combine the technical services into an integrated logistic system had not been successful. Instead, the group reiterated, these separate organizations were in some respects nearly self-sufficient entities within the overall Army structure and their divergent views and interests did not always coincide with overall Army aims and objectives.<sup>44</sup>

In the field of research and development, each technical service was concerned primarily with its own peculiar items. The Ordnance Corps spent approximately 67 percent of the Army's research and development funds, Signal 15 percent, Chemical and Transportation 5

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<sup>43</sup>Ibid., p. IV-215.

<sup>44</sup> Report on the Reorganization of the DA, Dec 1961, pp. 18 - 19.

percent each, Engineers 4 percent, and Quartermaster approximately 1 percent. Each used laboratories, design and engineering activities, and proving grounds in accomplishing its assigned mission.

For their procurement activities, the technical services maintained 81 major procurement offices in the continental United States. The Chief of Ordnance operated a procurement system involving commodity commands, arsenals and procurement districts, which were assigned specific geographic areas. The Chief of Engineers operated a centralized procurement system with decentralized administration of contracts. The Quartermaster General had four separate procurement systems, while the Chief Chemical Officer, Chief Signal Officer, and the Chief of Transportation had a centralized control over the placement and administration of contracts. However, in the Signal and Chemical Corps, technical guidance on contracts was not furnished by the contracting agency.<sup>45</sup>

In the development, production, and supply of aircraft, the Navy, the U. S. Air Force and the aircraft industry had recognized the need for centralized technical and program direction. Under the weapons system concept practiced by those services, the prime manufacturers had developed the technical capability to control all characteristics of all aircraft equipment. This capability could

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<sup>45</sup>Ibid., pp. 14 - 15.

not be exploited by the Army because of the division of responsibility among the technical services for aircraft equipment. The airframe-engine combination was a responsibility of the Transportation Corps. Electronic equipment was a responsibility of the Signal Corps, which it developed and classified as separate end items. Armament installation was a responsibility of the Ordnance Corps. No single development agency was responsible for the overall technical characteristics of Army aircraft.<sup>46</sup>

A brief analysis of the development and production cycle for the Mohawk aircraft system reveals that the participation of many agencies in the program without central direction obviously caused difficulties in the fielding of a complex new weapon system. It was almost impossible to pinpoint the individual who was responsible for delays and deficiencies. This program began as a joint Army-Navy undertaking in 1954 at which time the Navy Bureau of Aeronautics placed several contracts. After approval of the military characteristics in 1956, a joint Army-Navy board selected the Gruman Aircraft Engineering Corporation to carry the program through the mock-up and prototype stages. Because of the high costs and other commitments, the Navy Department officially withdrew in 1958.

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<sup>46</sup> Ltr, Col Robert F. Schulz, OCofT, to Director, Project 80, 3 Oct 61, sub: Study of Functions, Organization and Procedures, OSD Project 80 (Army).

The Department of the Army decided to continue the Mohawk program alone and further determined that the aircraft should not be restricted to normal observations, as originally planned, but also should be used for surveillance purposes.<sup>47</sup>

Meanwhile, the Chief of Transportation held a coordinating conference, in 1958, with all interested agencies represented. Initial tests of the aircraft resulted in certain changes in design. Late in 1958, the Signal Corps indicated that electronic equipment would be extremely heavy, expensive, and untested, and that surveillance equipment might not be available in time to install in the aircraft. Late in 1959, the contractor stated that he was having trouble determining what the Department of the Army wanted. At that time, the Chief of Transportation announced that the Army Combat Surveillance Agency had been designated as the approving authority for all electronic and communication equipment on the Mohawk. The DCSLOG decided to defer Fiscal Year 1961 production, pointing out that the Department had been criticized for procuring the M48 tank when it had major deficiencies. It feared the development of a similar situation on the Mohawk. In April 1961, the Ordnance Corps representative reported that the new photographic flares would not be

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<sup>47</sup> Hoelscher Report, pt. IV, vol. II, pp. IV-242, IV-243.

available as scheduled since they had been deleted from the Ord-  
nance budget.<sup>48</sup>

Except for the ballistic missile programs, where special procedures were authorized, the Mohawk program represented one of the most complex systems that the Army had attempted to carry out under its regular procedures and organization. Four general staff agencies, six technical services, the CONARC, the Navy and the Air Force were involved in the management of the Mohawk system. Numerous subdivisions of each of these agencies took part in the program. A representative Mohawk Management Group meeting included 75 individuals representing 31 different offices and agencies. Although the Office of the Chief of Transportation tried to pull all parts of the Mohawk program together, the record indicates that other technical services and Army staff elements failed both to recognize the urgency of the program and to expedite their actions. Furthermore, the control of the various funds by different agencies caused much confusion. The following extract from a report on the Mohawk management meeting reflects the lack of central control and direction:

These meetings only provide a means of communication between all interested agencies and as a corporate body, the group has no authority to take actions directive in nature. Addressees are

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<sup>48</sup>Ibid., pp. IV-244, IV-245, IV-246, IV-247, IV-248

requested to initiate such actions as they deem essential within appropriate command channels so as to facilitate development of a wholly operational system for the U. S. Army. 49

In his comments, in January 1962, on the proposed reorganization of the Department of the Army, the Secretary of the Army stated that the organizational structure of the new Materiel Development and Logistics Command would permit broad utilization of the project manager concept. He expressed the belief that by more clearly fixing responsibility for accomplishment of major tasks, the Department of the Army would be able to operate with greater effectiveness, efficiency and economy.<sup>50</sup>

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<sup>49</sup>  
Ibid ., p. 250.

<sup>50</sup>  
News release, Statement by the Secretary of the Army, Elvis J. Stahr, Jr., on Reorganization of the Department of the Army, 16 Jan 62.



## CHAPTER II

### PREVIOUS EXPERIENCE WITH SPECIAL MANAGEMENT TECHNIQUES

#### Wide Variety of Management Techniques

##### In Government Agencies

The project manager concept of 1962 differed in some respects from previous attempts at managing weapons systems. The Hoelscher Committee made a comprehensive study of the variations in such methods as those that had been used by the Manhattan Project in developing the first atomic bomb, and by the Departments of the Army, Navy, and Air Force in managing their big missile systems. Among the specific types studied were those directed by one man, such as Adm. William F. Raborn's development of the Navy's Polaris missile, Maj. Gen. John B. Medaris' direction of the Army's Jupiter missile program, and the practices followed by the Air Force in managing its ballistic missile program.<sup>1</sup>

A brief survey of the various forms of project management practiced by the armed services reveals a wide variety of approaches.

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<sup>1</sup> (1) Rept, L. W. Hoelscher to SA, 5 Oct 61, sub: Study of Army Functions, Organization and Procedures, OSD Project 80 (Army), pt. II, pp. C1 - C17. Hereafter briefly cited as the Hoelscher Report. (2) See also Working Paper to Hoelscher Report, Study Group B, 21 Aug 61, sub: Systems Management in the Army.

Although there was a variety of forms and differences in the specific project offices, the basic characteristics were usually similar. At high levels in the military organization where decisions to support new programs were made, there was a tendency to separate research and development from production in order to encourage progressiveness. But once the program got under way, usually these functions were combined under project chiefs to ensure proper coordination. Some project groups served only as a kind of communication center for coordinating each individual facet of a weapons system with the many facets. Others served as a center for identifying and resolving conflicts or disagreements among functional segments.

The most common variety of special management was that set up for a single weapon system. Scientists, technicians, engineers, and other necessary specialists worked for the project director or manager. Because difficult questions frequently could not be resolved within a project office, there was a tendency toward increasing the power of the project chief by assigning higher ranking officers to these posts or by placing the office at a higher echelon than the functional groups in the command hierarchy. When a program was particularly urgent, the responsible project office was placed at a relatively high position in the overall organization and was given unusual authority over other agencies and functional

offices, first choice of personnel, dispensation from normal procedures, special financial support, and direct access to top service officials.<sup>2</sup>

### In Industry

Growth in size and complexity had been a challenge to management of large industrial organizations during the past 50 years. In 1960, decentralization of authority still characterized the largest and best managed organizations, but the concept of what authority should be delegated was changing. For instance, the aerospace industry favored a balance of power between the project manager and the functional executive. During the decade beginning in 1960, there was a growing recognition by top management that it should set the overall objectives concerning the growth and complexity of the organization. Moreover, corporate management of large organizations continued to develop a precise distinction between management levels, that is, between the responsibilities of top and operating management.<sup>3</sup>

Since the turn of the century, the growth in size and

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<sup>2</sup> See, Peck and Scherer, The Weapons Acquisition Process: An Economic Analysis, (Boston, 1962), pp. 82 - 84.

<sup>3</sup> See, Rept, AMC Board, 29 Nov 63, sub: Evaluation of New Management Concepts, pp. 20 - 21.

complexity of American industry had been caused by new markets, new technologies, new products, and new legal and economic environments. This growth challenged the management to devise a structure that could effectively administer the many diverse activities that contributed to the financial success of the corporation. No single executive could master all the skills and disciplines required to operate these large firms. The general solution to this challenge was the departmentalized structure and the delegation of authority. Among the first industries to employ this decentralized pattern were the E. I. duPont Company, the General Motors Corporation, the Standard Oil Company of New Jersey, and the Sears, Roebuck and Company.<sup>4</sup>

The decentralized structure, established by these firms between 1918 and 1929, underwent comparatively little change in the years to 1963. The decentralized pattern continued to be adopted as a solution to their bigness by other companies as they reached critical points in diversity and complexity. One of the most recent to change to a decentralized structure was the Kaiser Aluminum and Chemical Company. In 1962, an executive of the Radio Corporation of America stated that experience in industry had conclusively demonstrated that problems of growth were handled more effectively through decentralization and the establishment of autonomous units.

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<sup>4</sup>Ibid., p. 21.

This executive believed that, although able executives might be able to handle the problem of bigness, it was more sensible to establish structures readily manageable by "competent men who need not have genius status."<sup>5</sup>

But, in contrast to this concept of decentralization, in the past decade there was a growing argument that this concept was about to undergo a change. Decentralization had evolved primarily because of the obstacles of size, complexity, and communication. When technology, computer processing and transmission of information systems, data banks, uniform coding, and program packages were introduced, the stage was set for a change in the existing concept of decentralization. In the course of evaluating the new management concepts, the AMC Board noted that the extent of this change could not then be predicted, and it added that it would depend somewhat upon the extent to which the old concepts had become entrenched or institutionalized.<sup>6</sup>

#### The Program Package Concept

Since the project manager concept had to be compatible with the

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<sup>5</sup> Ibid., pp. 21 - 24.

<sup>6</sup> See Ibid., pp. 24 - 25, 48 - 49, for a discussion on the reversal of the trend towards a decentralized structure.

program package concept, the Hoelscher Committee studied this new way of looking at the allocation of resources among a variety of mission objectives. The decision-making process of the program package and of the project manager concepts required the fixing of responsibility and the collection of management information on a systematic, comprehensive, and regular basis.<sup>7</sup>

After the inauguration of President Kennedy in January 1961, and his appointment of Robert S. McNamara as Secretary of Defense, the Department of Defense made extensive and continuing changes. The adoption of the program package concept called for changes in the types and quantity of management information needed for making decisions. To obtain the necessary information on development and production projects, a single individual had to be assigned responsibility and held accountable for the management data required for making decisions on each major weapon system. As a solution to this problem, the AMC used the project manager concept, which was compatible with the Department of Defense program package concept.<sup>8</sup>

A brief review of management practices after 1949 indicates that the functional approach did not completely provide the rounded

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<sup>7</sup>Ltr, Lt Gen David Traub, Proj Director, DARPO, to Chmn, MDLC Planning Group, 29 May 62, sub: Paragraph 17, AR 11-25, Reduction of Lead Time.

<sup>8</sup>Ibid.

perspective required for making decisions. In 1949, following the recommendations of the Hoover Commission, Congress amended the National Security Act to require the use of a performance budget by the Department of Defense. From this legislation evolved an appropriation structure along a functional basis, which resulted in the well-known titles, such as operations and maintenance, procurement of equipment and missiles, and other similar groupings of activities performed in carrying out the Army's missions. The influence of this functional emphasis was felt in the development of the program system and related management processes in the Department of the Army.<sup>9</sup>

That the functional approach did not provide all of the perspective needed in evaluating Army resource requirements was recognized in 1954 by Maj. Gen. George H. Decker, then Comptroller of the Army, and later, in 1958, by Gen. Maxwell Taylor, then Chief of Staff.<sup>10</sup> Conditions, however, were not then ripe for shifting to a mission-oriented method of expressing budgetary requirements.

The situation was different in 1961. Then the newly appointed Secretary of Defense, Robert S. McNamara, recognized an urgent need for a more definite means of identifying the cost of military programs

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<sup>9</sup>DA, Initial Orientation Manual, 15 Nov 62, sub: Revision of the Army Program System, p.1.

<sup>10</sup>Ibid., pp. 1 - 2.

in terms of missions. He also realized that a need existed for revealing the long-range implications of these programs for use in making decisions. In addition, his Assistant Secretary of Defense (Comptroller), Charles J. Hitch, who had been with the Rand Corporation, had devoted much attention to the study of budgeting and accounting techniques that would facilitate the analysis of military problems. In 1960, he and Robert McKean wrote: "By far the most important reform is the recasting of budgets and accounts to reveal the costs of meaningful end-product missions or programs."<sup>11</sup>

No other defense program at that time had quite the impact, or received the publicity, as Comptroller Hitch's program package.<sup>12</sup> To get approved, a proposed weapon system had to be defended right down to spare parts and training manuals. This called for special management techniques. "Birth-to-death" cost-effectiveness studies had to be prepared. The armed services tailored their programs to get past the Hitch program package concept. To get approval, a program had to have the funds. When subjected to this concept, the

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<sup>11</sup>  
(1) Charles J. Hitch and Roland L. McKean, The Economics of Defense in the Nuclear Age (Cambridge, 1960), p. 234. (2) Address, ASD Charles J. Hitch, before the Operational Research Society of America, Philadelphia, 7 Nov 62. (3) Address, "The Defense Budget as a Management Tool," Charles J. Hitch, before Armed Forces Management Association, Wash., D. C., 1 Mar 61.

<sup>12</sup>  
Col William Thybony, "DOD Injects Incentive Into Contracts," Armed Forces Management, VIII (May 1962), pp. 18 - 20, 45.

Plato anti-missile missile failed to make it because of the cost and technical problems involved. The reoriented Plato program, known as the Field Army Ballistic Missile Defense System, did not make it, and the re-studied version became the Army Air Defense System 70's (AADS-70's).<sup>13</sup> Under this concept, the Secretary of Defense asked: "What is the most economical combination of weapon systems required to perform each of the nation's essential military missions?"

Basically, the program package concept, which became known as the programming system, was concerned with the cost, feasibility, and effectiveness of alternate methods of meeting military requirements in order to get the greatest benefits from expenditures. As established, the entire program system consisted of eight major programs.<sup>14</sup>

In revising its structure, the Department of the Army arranged it substantially parallel to the Army's field organization. In making its program responsive to Department of Defense requirements,

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<sup>13</sup>(1) Ltr, Chief, Organization and Systems Group, DCSLOG, to CG, AMC, 6 Nov 62, sub: Termination of Project Managership for FABMDS. (2) "Contractors Find Flaws in New Regime," Missiles & Rockets, XII (25 Mar 63), pp. 66, 68. (3) Congressional Record, vol. 109 (21 Jan 63), pp. 643 - 46.

<sup>14</sup>(1) AMCR 11-5, 17 Oct 62, sub: The DOD Programming System, and Change 1, 10 Jan 63. (2) A ninth program was under consideration.

The Department of the Army took full advantage of past experience in planning, programming, and budget integration. Since automation was an integral part of the plan for quickening response and handling the mass of data involved, the Department utilized information provided by its Autoprobe project. Autoprobe was an integrated, automated system designed to provide information for Department of the Army planning, programming, budgeting, resource management, command and control. This system enhanced the Department's responsiveness to Department of Defense requirements.<sup>15</sup> The Department established a special group, called Task Force Number 12, to decide on a method of applying Autoprobe to the coordination of project management at the Department level.<sup>16</sup>

Although the concept of program packaging had been in use for over 2 years by mid-1963, and had solid military endorsement, implementation of the idea at AMC field level still had a long way to go. A part of the trouble was that the program packaging idea was more easily and readily applied to single-mission weapons, such as the missiles and airplanes used by the Air Force, than the Army's

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<sup>15</sup> (1) DA, Initial Organization Manual, 15 Nov 62, sub: Revision of the Army Program System, pp. 43 - 49. (2) Autoprobe Report, 20 Dec 62, by Autoprobe Committee, copy in Historical Office files. (3) DF, Chief, Data Systems Office, AMC, to C/DP, et al., 26 Oct 62, sub: Autoprobe.

<sup>16</sup> Intvw, Author with Herbert Edlis, DSO, AMC, 28 Feb 64.

weapons. In the Department of the Army, this clean-cut mission capability tended to disappear. This made it difficult to allocate money in a way that was compatible with the ideas of military commanders, who thought in terms of the total mission capability of a given weapon.<sup>17</sup> Another problem was that the program package concept was based on management in terms of end-products and their cost, which were determined by commercial-type cost accounting. While this method was sound when measured by commercial standards, in the government, where the profit motive was missing, historical costs were not always reliable as a yardstick in measuring current operations. This lack of reliable cost data and the necessity of rearranging the appropriation practices to conform to new management plans posed real problems for the program package concept.<sup>18</sup>

#### The Manhattan Project

Among the previous experiences with special management techniques, from which the AMC planners learned much, was the Manhattan Project. While special management techniques contributed greatly to the success of this program, there was no doubt that its high

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<sup>17</sup>Intvw, Author with Lt Col Winfield S. Scott, Program Control Div, AMC, 27 May 63.

<sup>18</sup>(1) Erle Cato, "Program Packages Rest on Quicksand," Armed Forces Management, VIII (August 1962), pp. 36 - 37, 40 - 41. (2) "Program Packaging Report," Ibid., IX (March 1963), P. 43.

priority helped it to succeed. There was no guarantee that low-priority projects, using similar techniques, would have comparable success. Nevertheless, because of the record set by this project, many techniques used by its director were examined carefully by those responsible for introducing project management into the AMC.

Under the Manhattan Project, the United States developed the atomic bomb that was used against Japan near the end of World War II. To portray the difficulty of the task, a brief review of background information should be presented. This work began on a small scale in 1939 when Albert Einstein explained in a letter to President Roosevelt the desirability of encouraging work in this field. In that year, the President appointed the Advisory Committee on Uranium, which reported in November that chain reaction was a possibility and that it might supply power for submarines or an explosive for bombs. During 1939 and 1940, responsible scientists called attention to the enormous energy in uranium for controlled power and explosives, so that U-235 became a familiar word. But the financial support of a project depended not only upon the scientific and technological factors but also on policy decisions.<sup>19</sup>

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<sup>19</sup> (1) Henry DeWolf Smyth, Atomic Energy for Military Purposes: The Official Report on the Development of the Atomic Bomb under the Auspices of the United States Government, 1940 - 1945 (Princeton University Press, 1945), p. 41. (2) Arthur H. Compton, Atomic Quest (New York, 1956), pp. 27 - 28.

While many of the principles used were well known to the scientific world in 1940, the lack of information about the fundamental processes made it tremendously difficult to select the most promising method of producing fissionable material. It was not until October 1941 that the President gave the authority to discover if an atomic bomb could be made and at what price. Later came the painful transition from research and development and from control by the Office of Scientific Research and Development to Department of the Army control.<sup>20</sup>

In 1940, President Roosevelt directed that the Advisory Committee on Uranium be reconstituted under the National Defense Research Committee which was a part of the Office of Scientific Research and Development (OSRD). In 1941, Vannevar Bush, Director of the OSRD, decided to push the uranium work more vigorously.<sup>21</sup> Scientific personnel were limited, although this was not fully realized at the time. It was, therefore, difficult to decide at what rate the work on the atomic bomb should be carried forward.

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<sup>20</sup> Richard G. Hawlett and Oscar Anderson, Jr., A History of the U. S. Atomic Energy Commission, vol. I, The New World, 1939 - 1946 (Pennsylvania State University Press, 1962), pp. 5 - 6, 45 - 46. This is the first volume of the official history by the AEC historians.

<sup>21</sup> Ibid., pp. 73 - 74

The decision had to be reviewed at frequent intervals.

The basic military requirements were to provide the American armed forces with a weapon that would end the war before the enemy could develop such a weapon and use it. To do this, the utmost speed was believed to be necessary.<sup>23</sup> On 13 August 1942, the Corps of Engineers established the Manhattan Engineering District to carry out the work of developing an atomic bomb and, on 17 September, the Secretary of War placed Brig. Gen. Leslie R. Groves in complete charge of all Army activities relating to the project.<sup>24</sup>

### The Achievement

The Manhattan District developed a bomb that was "potentially destructive beyond the wildest nightmares of the imagination; a weapon so ideally suited to sudden unannounced attack that a country's major cities might be destroyed overnight by an ostensibly friendly power."<sup>25</sup> As a result of the efforts of the scientific groups at Berkeley, Chicago, Columbia, Los Alamos, and elsewhere,

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<sup>22</sup>

Smyth, Atomic Energy for Military Purposes, p. 44.

<sup>23</sup>

Lt Gen Leslie R. Groves, Now It Can Be Told: The Story of the Manhattan Project (New York, 1962), p. 11.

<sup>24</sup>

Smyth, Atomic Energy for Military Purposes, pp. 223 - 24.

<sup>25</sup>

Ibid., p. 224.

and of the industrial groups at Oak Ridge, Tennessee, and Hanford, Washington, and many other places, the Manhattan District, by the end of June 1945, had demonstrated a sustained neutron chain reaction resulting from nuclear fission. By that time, several different types of production plants were building a stockpile of explosive material.<sup>26</sup>

Mankind's transition to the atomic age, from a practical viewpoint, occurred on 16 July 1945 at Alamogordo, near Albuquerque, New Mexico. Here the first atomic explosion was achieved and its success was greater than the most ambitious estimates. There was a possibility that the bomb would not explode. Too big an explosion on the other hand might have meant an uncontrollable, unusable weapon.<sup>27</sup> There had never been an improvement in weapons comparable in degree and sudden impact to the atomic bomb.<sup>28</sup>

Further proof of the success of the Manhattan Project came on 12 August 1945 with the public announcement that the U. S. Army Air Forces had dropped an atomic bomb on Hiroshima on 6 August and on Nagasaki on 9 August. An assessment of the structural damage to these cities left no doubt that the results were successful in

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<sup>26</sup> Ibid., pp. 223 - 24.

<sup>27</sup> Ibid., App 6, War Department Release on New Mexico Test, 16 Jul 45, p. 9.

<sup>28</sup> Groves, Now It Can Be Told, p. 253.

every respect. No other country had been able to carry out parallel developments during a war period.<sup>29</sup>

The cost of the Manhattan Project was reflected by the erection of whole cities and a chain of specially constructed industrial plants, plus unprecedented experimentation. The entire project represented a wartime investment of more than \$2.2 billion. Included in a transfer from the Department of the Army to the Atomic Energy Commission were 37 installations in 19 states and Canada. With the facilities went 254 military officers, 1,688 enlisted men, 3,950 Civil Service employees, and approximately 38,000 contractor employees.<sup>30</sup>

#### Reasons for Success

The focal point in the success of the Manhattan Project lay in the fact that "no other country in the world had been capable of such an outlay in brains and technical effort."<sup>31</sup> Teams of top men on specific phases of science performed their specific part of the work. Dr. Bush thought of the organization as a large

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<sup>29</sup>(1) Hewlett and Anderson, A History of the U. S. AEC, p. xi, 401 - 02. (2) Smyth, Atomic Energy for Military Purposes, pp. 223 - 24.

<sup>30</sup>Hewlett and Anderson, A History of the U. S. AEC, p. 2.

<sup>31</sup>Smyth, Atomic Energy for Military Purposes, p. 248.

corporation with the high-level military policy committee as a board of directors and General Groves as the vice-president in charge of operations. Dr. Bush realized that the project needed clear-cut authority at high level in the Department of the Army and he insisted that the civilian scientists be well represented on the policy committee.<sup>32</sup>

Several other factors tended to expedite the development and production of the atomic bomb. Expenditures of effort and money that would have seemed fantastic in 1940 were considered obviously necessary after the attack on Pearl Harbor in December 1941. The fear that Germany might make a tremendous effort to produce an atomic bomb made time a most important factor. Furthermore, the possibility of the United States producing the bomb for use in World War II seemed to be great enough to justify an all-out effort to produce it.<sup>33</sup>

General Groves emphasized the "cohesive entity" of the Manhattan Project as a great factor in its success. He referred to it as the first large organization of its kind, America's greatest scientific success, and a project from which others could learn many lessons. Although the command channels changed with conditions,

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<sup>32</sup> Hewlett and Anderson, A History of the U. S. AEC, pp. 81 - 82.

<sup>33</sup> Smyth, Atomic Energy for Military Purposes, pp.73 - 75.

the basic concept -- that of keeping authority and responsibility together -- never changed.<sup>34</sup>

According to General Groves, the Manhattan Project was highly successful because of the following reasons: the project had a clearly defined, unmistakable, specific objective and, consequently, the people in responsible positions could tailor every action to its accomplishment; each separate task was carefully supervised so that the sum of the tasks resulted in the accomplishment of the overall mission; there was positive, clear-cut direction at all levels; the project made maximum use of governmental, industrial, and academic agencies and facilities; and finally, the project had the full backing of the Government, and a nearly infinite potential of American science and engineering, and thousands of determined men and women working for the safety of their country.<sup>35</sup>

### The Navy's Polaris Project

#### Comparison with Army and Air Force Projects

Each of the three armed services established special agencies to accelerate the development of the first ballistic missiles. To

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<sup>34</sup> Groves, Now It Can Be Told, pp. x, xi.

<sup>35</sup> (1) Ibid., pp. 414 - 15. (2) Smyth, Atomic Energy for Military Purposes, p. 224.

manage its Atlas, Thor, and Titan programs, the Department of the Air Force created the Ballistic Missile Division of the Air Research and Development Command. The Navy Department organized its Special Projects Office for the Polaris missile, while the Department of the Army set up the Army Ballistic Missile Agency for the Jupiter missile. Each of the services placed its special agency in a relatively high position in the overall organization. Each gave its agency first choice of personnel, unusual authority over other agencies and functional offices, exemption from normal procurement procedures, direct access to top service officials, and special financial support. A single individual exercised authority over personnel, materials, facilities, and funds involved in the development of a particular system. These resources were under his direct control or they were provided by agencies within the organization. These projects were highly significant in the defense effort of the United States and carried high priority within their respective services.<sup>36</sup>

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<sup>36</sup> Hoelscher Report, Pt. II, pp. C1 - C17. (2) Peck and Scherer, The Weapons Acquisition Process, pp. 82 - 84. (3) Study, United Research Incorporated for ASD (I&L), Jan 1962, sub: The Extension of Special Organizational Patterns and Management Techniques to Additional Weapon Systems, pp. 2 - 1 to 2 - 24.

## Special Projects Office

In the Navy Department, the ballistic missile program challenged the existing organization more sharply than any previous Navy weapon effort. Requiring extensive development in entirely new missile propulsion and control areas, in ship design and construction, and in precise navigation, this program cut squarely across organizational lines. Furthermore, the importance of the program to national defense imposed the highest priority on this development.<sup>37</sup>

The Department's answer was the creation of the Special Projects Office as a task force, under Rear Adm. William F. Raborn, to direct the diverse aspects of the development program, including the effort of the Navy bureaus and offices, field activities, and private contractors. Established in November 1955 as an adjunct to the Bureau of Ordnance to handle the sea-going version of the Jupiter missile, the Special Projects Office became responsible for the entire fleet ballistic missile system when the Navy Department separated its efforts from the Department of the Army's program and proceeded with its own solid propellant missile development in

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<sup>37</sup> Statement of Hon. Fred A. Bantz, ASECNAV (Materiel), 8 Mar 59, before H. Subcommittee on Military Operations of Committee on Appropriations, 86th Cong., 1st sess., Hearings on Organizational Management of Missile Programs, p. 388.

December 1956. The Special Projects Office reported directly to the Navy Ballistic Missiles Committee and the Secretary of the Navy, as chairman of the committee, for policy guidance and program review. The Chief of Naval Operations laid down the operating performance requirements. Small field offices provided on-the-spot coordination and supervision of contractor efforts.<sup>38</sup>

A Manhattan District type of organization, the Special projects Office had a relatively small military and civilian staff, which was essentially a task force with authority to achieve high-priority goals in the shortest time possible. Key positions involving technical direction, planning, and administration were filled with experienced Naval officers and highly trained Civil Service employees. Approximately 400 of these highly trained and experienced personnel were located in the headquarters of the Special Projects Office in Washington, D. C. An additional 500 were stationed at the major contractors' plants, and still another 500, who were assigned to the Special Projects Office, were at the Naval Weapons Annex, Charleston, S. C. They formed a vital part of the Government-industry team which developed and produced the Polaris system. They exercised control over approximately 450 prime

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<sup>38</sup> H. Rept 1121, 86th Cong., 1st sess., 2 Sep 59, Organization and Management of the Missile Programs, pp. 36 - 37.

contractors and thousands of subcontractors throughout the United States.<sup>39</sup>

Although the Special Projects Office determined the phasing of the work, directed the technical effort, and evaluated the performance, program control in terms of budget and number of weapons rested with the Secretary of Defense. The Ballistic Missile Committee, the Office of the Secretary of Defense, the Joint Chiefs of Staff, and the National Security Council reviewed the total program. The Program Evaluation Review Technique (PERT) provided management with a systematic method of monitoring the time-program relationship in order to identify critical schedule slippage in time for corrective action.<sup>40</sup>

Approximately 6 years before the start of the Polaris missile program, Rear Admiral Hyman Rickover led a group which began the development of the first nuclear-powered submarine. From the beginning of the Polaris program, the ultimate goal was the launching of the missile from the submarine. On 30 December 1959, the Navy Department

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- (1) Brochure, Special Projects Office, DN, Polaris Management, Fleet Ballistic Missile Program (GPO, revised, Sep 1962), p. 3. (2) Brochure, Special Projects Office, DN, Aug 1960, sub: The Polaris Fleet Ballistic Missile Weapons System, pp. 11 - 18.

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- (1) Brochure, Special Projects Office, DN, Polaris Management, Fleet Ballistic Missile Program, p. 2. (2) Bill Borklund, "Why Polaris is Winning its Race Against Time." Armed Forces Management (November 1958), pp. 8 - 11. (3) Booklet, Special Projects Office, DN, An Introduction to the PERT/COST System (GPO, 15 Oct 61).

commissioned the George Washington, at Groton, Conn., the first nuclear-powered, missile-carrying submarine. The George Washington completed its weapon system test program in August 1960, thereby demonstrating the feasibility of launching a missile from a submerged submarine at a target over 1,000 miles away. Thus, the Department's pioneering work on precise inertial guidance, fire control, air ejection launching, submarine construction, and solid rocket propellants culminated in an operational Polaris weapon system. The Navy Department completed the new weapon on the scheduled target date that had been set in late 1957.<sup>41</sup>

It should be pointed out that the January 1957 Polaris plan called for the deployment of operational missiles aboard the submarines by late 1963. However, before the end of 1957, the Navy Department proposed and the Secretary of Defense directed that the program be accelerated in order to deploy the Polaris 3 years earlier than originally scheduled. This meant that the Special Projects Office and the contractors had to submit plans for missile and component production far in advance of the customary lengthy testing periods. Despite the complexity of the Polaris system, the Navy Department and its contractors began parallel development and

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(1) Brochure, Special Projects Office, DN, Aug 1960, sub: The Polaris Fleet Ballistic Missile System, p. 12. (2) Ed Rees, The Seas and the Subs (New York, 1961), pp. 167, 187.

production. Admiral Raborn's Special Projects Office checked all  
of this work closely.<sup>42</sup>

#### Highlights of Raborn's Plan

Admiral Raborn knew that a new management technique would have to be developed to produce the Polaris missile on time and within the specifications. He had the authority, the priority, and the money. Admiral Arleigh Burke, Chief of Naval Operations, granted him extraordinary authority -- a grant that became known as Raborn's "hunting license." The Special Projects Office used a simplified milestone reporting system and line-of-balance analysis. Milestones were met on time. They were portrayed on PERT charts as diamonds and were joined together by lines. This system helped Raborn and his staff to visualize the flow of development, so that they could spend extra effort and money on the items that fell behind schedule. The management system showed them which part of the program was getting into trouble before the trouble really materialized. A unique feature of the Polaris management system was that it was handled as an in-house operation.<sup>43</sup>

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<sup>42</sup>Brochure, Special Projects Office, DN, Aug 1960, sub: The Polaris Fleet Ballistic Missile Weapons System, pp. 13 - 14.

<sup>43</sup>(1) Ibid., pp. 16 - 20. (2) Rees, The Seas and the Subs, pp. 148 - 52.

In developing the Polaris, the Navy Department took the approach that it was better to "freeze" the weapon system at a performance level which was related to a realistic completion date, than to add costly, time-consuming improvements. Navy engineers were not easily distracted by brochures or blueprints which suggested a better way of doing the job. They operated on the theory that it was better to have a 1,200-mile Polaris missile at sea in 1960 than to have a 1,500-mile missile nearly ready. Near the beginning of the program, Admiral Raborn told Admiral Burke that with industry's all-out effort the Polaris schedules could be advanced by a staggering amount of time, and that if the Department of Defense would settle for a 1,200-mile missile instead of a 1,500-mile one, the Navy could have an operational Polaris weapons system by 1960, a full 3 years earlier than planned.<sup>44</sup>

Admiral Raborn's management plan proved so effective that other government agencies and segments of industry began to use it. Harvard University's Dr. J. Sterling Livingston, a sharp critic of the management of military programs, and an expert whom Congress frequently consulted, spoke glowingly of the Polaris organization and management, explaining that the deficiencies found

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<sup>44</sup> Rees, The Seas and the Subs, pp. 147 - 48.

in the management of many other major weapons systems were not present in the Polaris program.<sup>45</sup>

Raborn's plan introduced new management techniques for research and development which dove-tailed into production. It permitted a relatively small staff to execute an integrated and balanced program. The plan provided a complete information system for program evaluation, forecasts, alternative decisions, and planning and programming. Furthermore, it provided a basis for presentations to higher echelons on the plans, status, and outlook for any selected area of effort, and gave the chief of each responsible agency or office and each contractor an understanding of his specific assigned responsibilities in relation to the total program.<sup>46</sup>

#### The Army's Jupiter Program

##### The Army Ballistic Missile Agency

As an elite agency to carry on its ballistic missile program, especially for the Jupiter missile, the Department of the Army,

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<sup>45</sup> Ibid., pp. 226 - 27.

<sup>46</sup> (1) Brochure, Special Projects Office, DN, Polaris Management, Fleet Ballistic Missile Program, p. 31. (2) For a good popular account of the background and development of the Polaris missile, see James Baar and William E. Howard Polaris (New York, 1960).

established the Army Ballistic Missile Agency (ABMA) at Redstone Arsenal, Huntsville, Alabama, in January 1956.<sup>47</sup> Like the Navy Department's Special Projects Office, the Army Ballistic Missile Agency received unusual authority over personnel, funds, and over-all operation of the Department of the Army's ballistic missile program. Although the Army Ballistic Missile Agency fell directly under the jurisdiction of the Chief of Ordnance, the Agency's Commanding General, Maj. Gen. John B. Medaris, had direct access to the Chief of Staff, the Secretary of the Army, the Army Missile Committee, the Advanced Research Projects Agency, and the National Aeronautics and Space Administration.<sup>48</sup>

Important to the Army Ballistic Missile Agency and the over-all Jupiter program was the earlier missile work of Dr. Wernher von Braun. In December 1954, while at Redstone Arsenal, he drafted a plan for the development of an intermediate range ballistic missile (IRBM) and submitted it to the Chief of Ordnance.<sup>49</sup> Based on

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<sup>47</sup>(1) DA GO 68, 22 Dec 55. (2) Ord Corps Order 3-56, 19 Jan 56.

<sup>48</sup> Memo, SGS for Deputy Chiefs of Staff, DA, et al., 27 Jan 56, sub: Organization for the Prosecution of the 1500-mile Missile Program. Copy in Historical monograph No. 3, "Special Powers Delegated to the Commanding General of the Army Ballistic Agency, 1 Feb 1956 - 31 Mar 1958," (Historical Div, ABMA, Feb 1961), App 2.

<sup>49</sup> Jupiter Development Plan, 29 Sep 56, p. 1.

Ordnance plans, the Army Chief of Research and Development proposed, in July 1955, to the Chief of Staff the development of an IRBM.<sup>50</sup> Late in 1955, the Department of the Army announced its intention of establishing the Army Ballistic Missile Agency and of delegating extraordinary authority to its Commanding General. In November, the Department of Defense officially approved the development of an IRBM, for which the Army Ballistic Missile Agency was established early in 1956.<sup>51</sup>

From 1956 to 1958, the special powers delegated to General Medaris applied only to the Jupiter missile. By early 1958, the growing need for centralized control of the development of a variety of missile systems made it apparent that a missile command was necessary for managing these systems. For that reason, the Department of the Army established the Army Ordnance Missile Command on 31 March 1958 and General Medaris became Commanding General of that organization. The Army Ballistic Missile Agency (ABMA) and the newly created Army Rocket and Missile Agency became subordinate agencies of the Army Ordnance Missile Command. General Medaris

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<sup>50</sup> Presentation, Chief of R&D, DA, to CS, Jul 55, cited in the ABMA Semi-Annual Historical Summary, 1 Feb 56 - 30 Jun 56, p. 4.

<sup>51</sup> (1) Memo, SECDEF for Army, Navy, and Air Force Secretaries, and Chmn, JCS, 8 Nov 55, sub: Establishment of OSD Ballistic Missile Committee. (2) Memo, D/SECDEF for Chmn, Joint Army-Navy Ballistic Committee, 20 Dec 55, sub: IRBM No. 2 Program.

retained his special delegated powers for application to special programs such as the high-priority Nike-Zeus missile system. The Department of the Army withdrew this special authority in 1960.<sup>52</sup>

The success of the Agency was reflected in its impressive accomplishments. Specifically, it launched the Nation's first intermediate range ballistic missile, boosted the first American satellite into orbit around the earth, and developed and tested the first nose cone capable of withstanding the tremendous heat created upon its re-entry into the earth's atmosphere from outer space. Early in November 1957, after Russia launched Sputnik II with a live dog inside, and after the Navy had failed to launch a satellite under Project Vanguard, the Secretary of Defense directed the Department of the Army to prepare to attempt to place a satellite in orbit in support of the International Geophysical Year effort. On 31 January 1958, only 84 days after the Secretary's order, the ABMA launched Explorer I, the first United States Satellite, from Cape Canaveral, Florida. This was followed by Explorer III in March, and by still another repeat performance in July 1958.<sup>53</sup>

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<sup>52</sup> (1) DA GO 12, 28 Mar 58. (2) Ordnance Corps Order 16-58, 1 Jul 58. (3) Historical Monograph No. 3, "Special Powers Delegated to Commanding General of the Army Ballistic Missile Agency, 1 February 1956 - 31 March 1958," pp. 28 - 29.

<sup>53</sup> Summary of Major Events and Problems of the Ordnance Corps, FY 1959, pp. 44 - 47, Hist Ofc files.

## Highlights of Medaris' Plan

Because of the scope of the Jupiter program and the necessity to accomplish the task with speed, effective management was essential. At the Army-Navy Departmental level, the Joint Army-Navy Ballistic Missile Committee controlled the program. After the Navy Department had progressed in its solid propellant study, Secretary of Defense Wilson authorized it to delete the liquid-propelled Jupiter from its program. This action prompted the dissolution of the Joint Army-Navy Committee and the formation of the Army Ballistic Missile Committee with the Secretary of the Army serving as chairman. This management set-up provided high-level review and program control authority.<sup>54</sup>

The organization of the Army Ballistic Missile Agency was a drastic new approach to the development and production of Army missiles. It meant a new era for the Army's experienced rocket and missile scientists and engineers. The Agency developed a streamlined, vertical-type organization so that the Jupiter missile would advance with maximum efficiency. When it used the special powers, it made prompt reports to the Secretary of the Army. Thus,

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<sup>54</sup> James M. Grimwood and Frances Strowd, "History of the Jupiter Missile System," (AOMC, July 1962), pp. 12 - 21, Hist Ofc files.

the experience of this Agency could be passed on to other organizations.<sup>55</sup>

General Medaris did not organize his staff in a normal manner. To reduce the time required for coordination, he brought the experts of the various Army technical services and other agencies into his organization. The Corps of Engineers, the Transportation Corps, the Signal Corps, the combat arms, and Army staff officers were represented. This made direct communications possible, which reduced the reaction time in settling specific technical problems. This permitted early and valid decisions in regard to program direction.<sup>56</sup>

The Secretary of the Army, the Chief of Staff, and the Chief of Ordnance made extensive delegation of authority to General Medaris. He issued instructions in his own name to all Army agencies needed in the discharge of his responsibilities, and he had direct access to the Chief of Staff when necessary to assure prompt action on his program. General Medaris could award contracts and

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<sup>55</sup>(1) Jupiter Development Plan, 29 Sep 56, pp. 1 - 4. (2) Ordnance Corps Order 3-56, 19 Jan 56, sub: Mission of ABMA. (3) For a full discussion of the special powers delegated to ABMA, see Semi-Annual Historical Summary, "History of the Army Ballistic Missile Agency, Feb-Jun 1956."

<sup>56</sup>Historical Monograph No. 3, "Special powers Delegated to the Commanding General of the Army Ballistic Missile Agency, 1 February 1956 - 31 March 1958," pp. 4 - 7, 13 - 16.

appoint his own contracting officers. On a cost reimbursable basis, he could direct other Army installations to assist in the timely completion of contracts. He could take appropriate procurement action and could make determinations concerning the availability of items under the Buy-American Act.<sup>57</sup>

Specifically, General Medaris had authority to deviate from Army procedures and regulations, as well as from Armed Services Procurement Regulations; he had power to approve awards of contracts without regard to money or quantitative limitations, subject only to the overall availability of funds, and to request the auditing of all types of contracts awarded; and he had authority to obtain any work or services needed at Government-owned installations. The power to approve awards of contracts was exceedingly important in a high-priority program. While the mere execution of a contract might appear to be a minor detail, it could be a time-consuming detail, and sometimes took the greater part of a year because of the requirement for review and approval at various echelons.<sup>58</sup>

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(1) Paul H. Satterfield and David S. Akens, "Government-Contractor Relationships at ABMA," (ABMA, 1 Jul 59), pp. 1 - 4, Hist Ofc files. (2) Ord Corps Order 3-56, 19 Jan 56.

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Study, United Research Incorporated for ASA (I&L), Jan 1962, sub: The Extension of Special Organizational Patterns and Management Techniques to Additional Weapon Systems, p. 2 - 10.

One of the most important special powers delegated to the ABMA was based on the Armed Forces Construction Authority Act of 1953,<sup>59</sup> and concerned the right of the Commanding General to acquire, or lease, such items as land, buildings, facilities, machine tools, and utilities that were pertinent to the program. Another special authority pertained to the establishment of advisory committees or panels necessary for research and development. The exercise of these and other special powers had to be fully justified.<sup>60</sup>

During the 2 years that the ABMA operated under these special powers, the Agency accomplished a vast amount of closely coordinated development and procurement work. General Medaris believed that these special powers played an important part in accomplishing the assigned mission. At the same time, the special powers were involved in only about 10 percent of the procurement actions involved in this operation. But the prompt use of these powers resulted in a striking reduction in lead time. Although Courtney Johnson, Assistant Secretary of the Army for Logistics, questioned whether the special delegated powers should become a regular practice, he was impressed by the results obtained. He believed that

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<sup>59</sup> 67 Stat. 177 (Act of July 17, 1953).

<sup>60</sup> Historical Monograph No. 3, "Special Powers Delegated to the Commanding General of the Army Ballistic Missile Agency, 1 February 1956 - 31 March 1958", pp. 21 - 29.

the old procedures requiring excessive lead time would have to be changed. The only question was which approach should be adopted.<sup>61</sup>

By applying these special powers, the ABMA completed some major procurement actions in a few hours. From the Agency's experience, it became apparent that special priority programs in the government could succeed without impairing the required standards. Thus, other "crash" programs could profit by the Agency's pioneering effort.<sup>62</sup>

### The USAF Ballistic Missile Program

#### The von Neumann Committee

The Air Force weapons management system was the subject of careful scrutiny from the time of the inception of the ballistic missile program. In 1953, Trevor Gardner, Special Assistant for Research, invited a panel of distinguished scientists, led by Dr. John von Neumann, to study the strategic missile systems. This Strategic Evaluation Committee recommended that, in view of the

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<sup>61</sup> (1) Ibid., pp. 30 - 37. (2) For a popular account of the exercise of the special powers delegated to the Army Ballistic Missile Agency and to the Army Ordnance Missile Command, see Maj. Gen. John B. Medaris (U. S. A. Ret.), Countdown for Decision, (New York, 1960).

<sup>62</sup> Satterfield and Akens, "Government-Contractor Relationships at ABMA", pp. 4 - 5.

new development in thermonuclear warheads, the existing intercontinental ballistic missile (ICBM) program be completely reoriented. After a comprehensive study of the available management capabilities and an assessment of the unsolved technical problems, the committee urged that a special management agency be established to reorient the program, supervise research, and exercise general technical and management control. The committee recognized that the managing group would have to have unquestioned technical competence and authority to unify and direct all elements of the working team.<sup>63</sup>

#### The Ballistic Missile Division

In response to the recommendations of the von Neumann committee, the Department of the Air Force established, in 1954, a special management group known as the Western Development Division (later renamed the Ballistic Missile Division) of the Air Research and Development Command. The Ballistic Missile Division was a special adaptation of the weapon system project office concept to ballistic missile management. For each major weapon system under procurement, the Department of the Air Force established a project office to

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<sup>63</sup> Statement of Secretary of the Air Force, Hearings, House Subcommittee of the Committee on Government Operations, 4 Feb 59, Organization and Management of Missile Programs, pp. 5 - 7.

exercise management control of the program. The objective was to assure proper phasing of development, procurement, production, maintenance, and supply for delivery and support of these complex weapon systems.<sup>64</sup>

Under command of Maj. Gen. Bernard A. Schriever, the Ballistic Missile Division became the management agency for the Air Force ballistic missile program, involving such missiles as the Atlas, Thor, Titan, and Minuteman. In view of the broad delegation of authority and the high priority of the ballistic missile programs, the Division operated virtually as an independent command, and, in most cases, dealt directly with the Air Force headquarters and the Air Force Ballistic Missiles Committee.<sup>65</sup>

The Ballistic Missile Division formulated special streamlined management procedures that were applicable from the operations level all the way up to the Secretary of the Air Force, and which provided a key mechanism for effective management for all aspects of the program. The test of the management was its ability to meet the scheduled requirements for operational missiles. According to Secretary of the Air Force James H. Douglas, the Division "beat the

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<sup>64</sup> H. Report 1121, 86th Cong., 1st sess., Eleventh Report by the Committee on Government Operations, Organization and management of Missile Programs, Sep 2, 1959, pp. 30 - 31.

<sup>65</sup> Ibid., pp. 32 - 33.

clock" and surprised many experts in getting Thor and Atlas missiles from the factory to the field in so short a period of time. The Atlas achieved operational capability within 2 months of the date originally scheduled some 5 years earlier and from 2 to 3 years earlier than believed possible in independent experts. The Air Force deployed the Thor missile for operational use just 3 years after initiation of the program. Furthermore, the actual performance of the Thor significantly exceeded the initial design objective.<sup>66</sup>

While the Air Force believed that these results justified the original management concepts, it did not believe that any form of weapon system management could be entirely free from difficulty. Thus, from the outset, the Department of the Air Force was aware that there were several inherent problems in its contractual relationship with the Ramo-Wooldridge Corporation and Space Technology Laboratories. The Committee on Government Operations of the House of Representatives made an extensive study of the Department's management system. In its report, the committee emphasized the importance of complete objectivity on the part of the contractors.

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<sup>66</sup> Statements of Under Secretary of the Air Force and Lt. Gen. B. A. Schriever, CG, ARDC, Hearings, Subcommittee of the Committee on Government Operations, House of Representatives, 86th Cong., 2d sess., May 6, 1960, Organization and Management of Missile Programs, pp. 80 - 81.

While the solution to the problem was by no means clear, the report concluded that the Space Technology Laboratories would have to be converted to a nonprofit organization.<sup>67</sup>

### Principles of Air Force Systems Management

In general, the Department of the Air Force management structure of the 1960's continued to follow the principles laid down in the von Neumann report of 1954. The aim was to compress the lead time to a minimum in weapons development, production, and deployment. Basically, the plan called for bringing in top research and industrial firms to work with the Air Force as a management team. In this approach, management abandoned the step-by-step procedure, in favor of simultaneous development, testing, and production of a weapon system and its supporting equipment. The object was to avoid delays in making decisions in this huge establishment.<sup>68</sup>

With the reorganization of the U. S. Air Force in 1961, the Air Force Systems Command, which superseded the Air Force Research and Development Command, took full responsibility for the development

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<sup>67</sup> Ibid., p. 82.

<sup>68</sup> (1) John P. Kushnerick, "The Zuckert-LeMay Management Team," Aerospace Management, IV (December 1961), pp. 20 - 23. (2) Col. John R. Saunders, Jr., and others, "Selective Systems Management", 1 Jun 61, issued by Institute of Technology, Air University, Wright-Patterson AFB, with Ohio State University.

of the Air Force's major weapon systems. The degree of management by individual weapon systems depended generally upon the size and complexity of the system. Under the new command, the systems or project office, which usually relied heavily upon the contractor, knitted together the development and production aspects of a weapon system, although training and logistics problems remained. No other Air Force programs had quite the acute management problems as the intercontinental ballistic missiles. In some instances the Air Force overcame these problems by authorizing the prime contractor to coordinate the program.<sup>69</sup>

The purpose of the systems management procedures was to assure that weapon systems received continuous attention over the interests of any one functional organization. Complexity, long lead time, the involvement of extensive resources, and urgent necessity were the main factors which made systems management mandatory. This type of management assured that each participating organization was fully aware of the actions of all other participating agencies. The project directors were in a sense similar to a quarterback in his relationship

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<sup>69</sup> Study, United Research Incorporated for ASA (I&L). Jan 1962, sub: The Extension of Special Organizational Patterns and Management Techniques to Additional Weapon Systems, pp. 2-21, A-1.

to a team. Nevertheless, systems management and functional management were designed to complement each other.<sup>70</sup>

To speed the development and production of weapons, the Air Force established a systems office with a manager for each major system. The managers used the Program Evaluation Review Technique and milestone markers, which was a checklist of events that had to occur before the weapon system was completed. On all priority projects, there was a "red line" running directly from the project officer to the Chief of Staff and the Secretary of the Air Force. After spotting trouble in the field, the project officer determined whether it was serious enough to be "red-lined." The Secretary of the Air Force made the final decisions on all such problems, and he often received guidance from the Secretary of Defense. The entire management system was designed to assure a standardized and coordinated approach among all members of the management team.<sup>71</sup>

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<sup>70</sup> AFR 371-1, 12 Feb 62, sub: Systems Management - Management of Systems Programs.

<sup>71</sup>(1) Lt Col Charles W. Getz, "Black Saturday at BMD," Part I, "What Team Management Means to the Ballistic Missile Division," Armed Forces Management, V (August 1959), pp. 26 - 30, and Part II, "Most Important Tool: Management Analysis," ibid., V (September 1959), pp. 24 - 33. (2) John P. Kushnerick, "The Zuckert-LeMay Management Team," Aerospace Management, IV (December 1961), pp. 24 - 28. For an excellent account of the Air Force's approach to weapon costs, see David Novick, "Weapon-System Cost Methodology", (Rand Corp. Report R-287, 1 Feb 56). The principles of the Dept of the Air Force weapon system management program are set forth in Air Force Regulation Nos. 375-1, 375-2, 375-3, and 375-4, dated 12 February 1962, sub: Systems Management.

## CHAPTER III

### WEAPON SYSTEMS MANAGEMENT IN THE TECHNICAL SERVICES

In the decade preceding the reorganization of the Army in 1962, the technical services had established various organizations, procedures and policies for managing weapon systems. There were similarities in the concepts and procedures in these various management systems, but there were also differences because of different requirements and organizational structures. The Deputy Chief of Staff for Logistics fostered weapon systems management by requiring the technical services to project financial requirements for weapons across budgetary lines and into the future. The Office of the Chief of Research and Development made a similar effort. There was no focal point, however, at the Army staff level for looking at weapon systems as a whole, or for relating these systems to the program-budget system. In addition, the Hoelscher Committee found that although it was contemplated that the integration process would occur at the technical service level, this did not prevent the technical services from receiving conflicting instructions. Furthermore, when several technical services were involved, no one of them had control over the funds of another.<sup>1</sup>

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Rept, L. W. Hoelscher to SA, 5 Oct 61, sub: Study of Army Functions, Organization and Procedures, OSD Project 80 (Army), Pt II, p. 62. Hereafter briefly cited as Hoelscher Report.

With the introduction of the various management techniques, opportunities arose for confusion in terminology because of the lack of uniformity in the terms applied to the various techniques. Within the functional organization, there were commodity coordinators, project officers, weapon systems managers, project directors, management groups or teams, product managers, and project managers. These designated individuals or groups were identified with the functional staffs. Under most of these management systems, the funding of the item remained with the major staff elements of the existing organization, which accomplished the coordination through the normal methods of communication. An individual usually managed those portions of a weapon system that were being developed within his organizational area. In some cases, a mixture of engineers, scientists and production personnel managed a particular weapon system as a team. Various individuals had suggested that the Department of the Army establish systems managers for handling complex weapon systems. In general, they were not aware of the fact that for many years the Department of the Army had used a form of systems managership for certain high-priority programs. Much confusion stemmed from the fact that the term "systems management" had been used loosely both within and outside the military

departments. Many of these management techniques were simply modifications of what was known commonly as "systems management."<sup>2</sup>

Weapon systems management, in general, meant the process of planning, scheduling, and controlling weapon systems, with an overriding authority to coordinate across the lines of program and appropriation structure and the normal functional alignments. It involved the correlating of all functions in the life cycle of a weapon system. The experience of the technical services in weapon systems management later proved to be valuable to the AMC in establishing project management. In fact, the 1961 Department of the Army policy guidance directives for weapon systems management became the basis for the new policy directives for project management in 1962.<sup>3</sup>

#### Weapon Systems Management in the Ordnance Corps

Traditionally, the Department of the Army had assigned weapon programs to one of its seven technical services, and within each had

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<sup>2</sup> (1) Ibid., Pt II, pp. II-C-1 - II-C-22. (2) Ibid., Pt IV, Vol. II, pp. 237 - 51.

<sup>3</sup> (1) Ibid., Pt II, p. II-C-1. (2) Log/EL-23929, Log Directive 152-715, 12 Sep 61, DCSLOG, sub: Complex Weapon and Equip Sys Mgt. (3) TAG ltr, AGAM-P (M) 310.1 (16 Oct 61) DCSLOG, 18 Oct 61, sub: Policy Guidance on Weapon/Equip Sys Mgt in the Army.

used the commodity manager concept for the development and production phases. For example, within the Ordnance Corps, responsibility for the Shillelagh weapon system had been split between the Ordnance Tank Automotive Command, which was the commodity manager for developing the vehicle, and the Ordnance Missile Command, which was responsible for the missile.<sup>4</sup> Beginning in 1958, the technical services applied quite extensively the concept of weapon systems management. In 1961, a contract study on the operation of this concept recommended that, in the application of systems management, the Deputy Chief of Staff for Logistics should draw upon the experience of the technical services. The study further proposed that the Department of the Army could profitably expand the system of management which had been begun by the technical services.<sup>5</sup>

In the period following the Korean War, the Ordnance Corps experimented with various plans for managing its weapon systems. Before the activation of the AMC and the establishment of project managers under that Command, the Corps had progressed through three

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<sup>4</sup> Study, United Research Incorporated for ASD (I&L), Jan 1962, sub: The Extension of Special Organizational Patterns and Management Techniques to Additional Weapon Systems, pp. 2 - 16.

<sup>5</sup> Rept, George Washington Univ in cooperation with DCSLOG, April 1961, sub: The Army Logistics Study, Report No. 6, preface. The complete study contains six reports. Reports Nos. 1, 2, and 3 were prepared in 1958 and Report No. 4 in November 1959. Report No. 5, "Management Decision-Making-Guidance, Structure and Information," is dated August 1960.

stages in the management of its major weapon programs. In chronological order, these stages were as follows: a weapon system coordination plan, which the Corps established in 1957;<sup>6</sup> a weapon system management plan, which it established in 1958;<sup>7</sup> and project managers, who were named in 1961 at the request of the Secretary of Defense.<sup>8</sup>

In 1957, the Ordnance weapon system coordination plan superseded the commodity coordination plan which had been established in 1955.<sup>9</sup> The Chief of Ordnance defined "coordination" as "cooperation of all agencies concerned in an undertaking to insure effective teamwork." He appointed the Assistant Chief of Ordnance for Program Coordination as the principal planning and control officer for weapon system coordination. Specifically, the latter consolidated the various plans submitted by the functional divisions and recommended the changes necessary to maintain a balance in the Ordnance Corps master plan for weapon systems. But he had no authority

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<sup>6</sup> Ord Corps Order 23-57, 15 Sep 57, sub: Ord Weapon Sys Coordination.

<sup>7</sup> Ltr, CofOrd to CG, OWC, and CO, Picatinny Arsenal, 11 Apr 58, Sub: Assignment of Davy Crockett Weapon Sys Responsibility.

<sup>8</sup> Memo, SA for CS, 21 Jul 61, sub: Proj Officers.

<sup>9</sup> (1) Ord Corps Order 39-55, 5 Oct 55, sub: Commodity Coordination. (2) OCM 14-56, 16 Jul 56, sub: Assistant Coordinators. (3) Ord Corps Tech Instruction 900-1-56, 18 Apr 56, sub: Commodity Coordination Conferences.

for infringing on the responsibilities of the division chiefs. The division chiefs transmitted to the program coordination chief the schedules for controlling the elements of each weapon system, with special reference to preserving a balance among the various elements.<sup>10</sup> In turn, the program coordination chief appointed, within his office, weapon system coordinators for designated groups of weapons, such as tanks, trucks, guns, and missiles.<sup>11</sup>

According to Brig. Gen. John W. Cave, Assistant Chief of Ordnance for Program Coordination, the Weapon System Coordination Plan permitted the Ordnance Corps to standardize the terms and fix dates, so that all responsible offices and divisions could "sing from the same sheet of music." Under the plan, General Cave provided the Chief of Ordnance with the factual data needed for making top management decisions. The commodity commands and arsenals submitted coordinated plans to the responsible divisions at headquarters, which, in turn, submitted them to General Cave's office. For the control of each weapon system, the Ordnance Corps had 20 check points, or milestones, which General Cave believed to be the minimum number that would assure an orderly, meaningful evaluation of a

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<sup>10</sup> Ord Corps Order 23-57, 5 Sep 57, sub: Ord Weapon Sys Coordination.

<sup>11</sup> Memo Col W. R. Huber, Chief, Weapon Sys Br, OCO, 8 Nov 57 sub: Assignment of Responsibility, Weapon Sys Coordination. Hist Ofc files.

system. These milestones, such as feasibility study, engineering design, delivery of test prototypes, release for industrial engineering, and completion of the weapon, were shown on a chart, which reflected the actual progress compared to the projected schedule, thereby revealing any slippage for any component. From this information, top-level decisions and forecasts of completion dates could be made.<sup>12</sup>

In 1958, the Ordnance weapon system management program had evolved from the weapon system coordination program. In April of that year, Maj. Gen. J. H. Hinrichs, then Chief of Ordnance, delegated complete responsibility for the Davy Crockett weapon system to Brig. Gen. W. K. Ghormley, then Commanding General of the Ordnance Weapons Command. Ordnance personnel consider this to be the first Ordnance weapon system to be placed under this particular type of project management, which differed in some degree from weapon systems coordination and project officer assignments.<sup>13</sup>

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<sup>12</sup>(1) Presentation, Brig Gen John W. Cave, ACofOrd, Program Coordination, 7 Mar 58, sub: Weapon Sys Coordination. (2) Ord Corps Tech Instruction 200-11-57, 3 Dec 57, sub: Phase Status of Development Projects (RCS ORDTX-113). (3) MFR, Brig Gen John W. Cave, 4 Dec 57, sub: Definitions and Abbreviations of Control Points for Weapon Sys Coordination. All in Hist Ofc files.

<sup>13</sup>(1) Intvw, Author with Sarah Clements, C/DP, Hq, AMC, 7 Feb 63. (2) Ltr, CofOrd to CG, OWC, and CO, Picatinny Arsenal, 11 Apr 58, sub: Assignment of Davy Crockett System Responsibility. (3) Intvw, Author with G. D. Burke, Development Div, AMC, 10 Feb 64. Mr. Burke was the first project officer of the Davy Crockett before the Chief of Ordnance placed it under weapon systems management. (4) OWC Reg 1-2, 13 Jun 58, sub: Davy Crockett Weapon Sys.

General Hinrichs directed General Ghormley to utilize other Ordnance installations and activities in executing the program. General Ghormley had control of all funds that were to be applied to the Davy Crockett weapon system. Under this management plan, commanders of other Ordnance installations participated in the Davy Crockett program as directed by General Ghormley and submitted progress reports to him. For example, General Ghormley had authority to use the facilities of the Ordnance Training Command "to the maximum extent in the discharge of his management responsibility." Furthermore, when it was necessary for the Commanding General of the Ordnance Training Command to deal with the Office of the Chief of Ordnance regarding this service, he communicated through the Commanding General of the Ordnance Weapons Command.<sup>14</sup>

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<sup>14</sup>  
(1) Ltr, CofOrd to CG, OWC, and CO, Picatinny Arsenal, 11 Apr 58, sub: Assignment of Davy Crockett Weapon Sys Responsibility, Davy Crockett PMSO, AMC file 00/84011761. (2) OWC Reg 1-2, 13 Jun 58, sub: Davy Crockett Weapon Sys. (3) Ltr, CG, OWC, to CofOrd, 13 Jun 58, sub: Assignment of Davy Crockett Weapon Sys Responsibility, PMSO file. (4) Ltr, CofOrd to CG, OWC, 17 Jun 58, same sub, PMSO file, 008U1 19828. (5) Memo, Executive Officer, OCO, to OCO Division Chiefs, 19 Jun 58, sub: Funding for Davy Crockett Weapon Sys, PMSO file. (6) Ltr, ACofOrd for Manpower to CG, Ord Training Command, 22 Jul 58, sub: Weapon Systems Responsibility for Davy Crockett, PMSO file, 00/8U0 23017. (7) Memo, Chief, Industrial Div, OCO, to Chief, Program Cordination Office, OCO, 15 Jul 58, sub: Assignment of Davy Crockett Weapon Sys to a Budget Sub-Project. (8) Msg, CG, OAC, to Executive Off, OCO, 25 Jun 58, sub: Information for Gen McMorro, ORDOX and Gen Cave ORDPX.

General Hinrichs thought of the fundamental mission of the Ordnance Corps in terms of weapon systems, which included all related equipment, services, and personnel required to provide the weapons. He therefore viewed the performance of the corps in terms of weapon systems, and, during 1960, directed his weapon system managers to keep him informed on a "flash" basis of any significant "trouble areas that are brewing in our weapon system program." He was concerned especially with such factors as price increases, and development or production slippage. He requested immediate reports of any difficulty in order that he might advise the Department of the Army staff on a timely basis and might apply all the resources of the Corps to prevent a delay in fulfilling an Ordnance commitment.<sup>15</sup>

The Chief of Ordnance normally appointed a weapon system manager before the beginning of end-item development for a proposed weapon system. Generally, the manager was the commander whose command had a prominent role in providing the complete weapon system.<sup>16</sup>

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<sup>15</sup>  
(1) Ltr, CofOrd to all Ord Commands, APG, Watervliet and Frankford Arsenals, 5 Jul 60, sub: Reporting Difficulties in Ord Weapon Sys Programs, 00/60-UO-3795. (2) Ltr, Brig Gen John W. Cave, ACofOrd, to Ord Commands, Arsenals and APG, 8 Apr 60, same sub, 00/60UO-2045.

<sup>16</sup>  
Ord Corps Order 22-59, 10 Aug 59, sub: Weapon System Mgt.

General Hinrichs held the weapon system manager responsible for obtaining the full use of all available resources in accomplishing the assigned mission. In a sense, he considered the manager to be the custodian of the "Ordnance readiness date." In essence, he believed that the Corps could meet its commitments only through effectively supporting its weapon system managers. Nevertheless, he felt it equally important that the managers support "the Ordnance team," which referred to all organizational elements of the Corps. General Hinrichs referred to this cooperation as "a two-way street."<sup>17</sup>

The Corps continued to expand its weapon system management plan during 1959 - 60. In May 1959, the Chief of Ordnance established the Systems Work Assignment Group (SWAG) to recommend the assignment of weapon system managers as it deemed appropriate. The SWAG membership included the chiefs of the divisions and main staff offices in the Office of the Chief of Ordnance. The Deputy Chief of Ordnance served as its chairman. The Chief of the Office of Program Coordination served as executive secretary of the group and provided administrative support.<sup>18</sup>

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<sup>17</sup> (1) Ltr, CofOrd to Brig Gen J. J. Weber, CG, OTAC, 14 Aug 59, sub: Weapons System Mgt, Davy Crockett PMSO file. (2) ORDM 1-6, 1 Jul 59, sub: Ord Command Mgt System -- Operating and Supporting Schedules.

<sup>18</sup> Ord Corps Order 17-59, 12 May 59, sub: SWAG.

Following the recommendations of the Systems Work Assignment Group, General Hinrichs, in July 1959, designated the Commanding General of the Ordnance Tank-Automotive Command as weapons system manager for the Shillelagh weapon system.<sup>19</sup> He assigned the responsibility for the management of 21 missile and rocket systems to the Commanding General of the Army Ordnance Missile Command, who, in turn, appointed 14 weapon systems managers to these projects.<sup>20</sup>

In 1960, the Chief of Ordnance had placed the following projects under weapon systems management: the Heavy Antitank Weapon System; the XM102 and 104 series of light, towed and self-propelled, 105-mm howitzers; the Pyrotechnic Battlefield Illuminating System; the T257 series of self-propelled, full-tracked, 81-mm, 4.2-inch mortar; the T236 series of self-propelled, full-tracked, 8-inch howitzer; the 195 series of self-propelled, full-tracked, 105-mm howitzer; the XM112 series of medium, towed, 155-mm howitzer; the T-196 series of self-propelled, full-tracked, 155-mm howitzer; the main battle tank; the full-tracked carrier for the 120-mm recoilless

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<sup>19</sup> Ltr, CofOrd to CG, OTAC, 30 Jul 59, sub: Assignment of Weapon System Mgt Responsibility, ORDPA, 00/9U0-9678.

<sup>20</sup> Ltr, Cof Ord to MDLC Planning Group, 15 Mar 62, sub: Weapon Sys Mgt.

rifle; the M101A1E1, light, towed, 101-mm howitzer; and the T-235  
series of self-propelled, full-tracked, 175-mm gun.<sup>21</sup>

In keeping with the Ordnance practice of expanding the weapon systems management program, General Hinrichs, in July 1961, designated the Commanding General of the Ordnance Weapons Command as weapon system manager for Army Aircraft armament subsystems,<sup>22</sup> and, in August, he placed the Entac, an antitank guided missile, under the Commanding General of the Ordnance Missile Command.<sup>23</sup> The Chief of Ordnance further increased the number of weapon system managers in 1962 by designating the Commanding General of the Ordnance Weapons Command as weapon system manager for the Rapid Fire Weapon System, by assigning the T114 full-tracked, armored personnel carrier to the Commanding General of the Ordnance Tank-Automotive Command, and by naming the Commanding General of the Ordnance Missile Command as weapon system manager for the Heavy Antitank-Assault Weapon System (TOW).<sup>24</sup> By the time the AMC was activated in May 1962, the Chief of Ordnance had placed a total of more than 30 weapon systems, or combinations of weapons, under weapon system managers.

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<sup>21</sup> See Ord Corps Orders 100-60 through 111-60, published 12 May, 23 Sep, 12 Oct, 23 Nov, 22 and 23 Dec 60.

<sup>22</sup> Ord Corps Order 100-61, 11 Jul 61.

<sup>23</sup> Ibid., 101-61, 7 Aug 61.

<sup>24</sup> See ibid., 100-62, 19 Feb; 101-62, 4 Apr; 102-62, 12 Jul 62.

Of primary concern to weapon systems management was the prevention of slippage and the anticipation of difficulties in time to take preventive measures.<sup>25</sup> This system also recognized the concept of decentralization of operations and the utilization of facilities not directly under the control of the weapon system manager. It utilized a common management language for planning, authorizing, accounting for, and reporting on all work and resources. The system was designed to provide the "right action at the right time." It relied on a central plans and program division to deal directly with the weapon system manager in directing a comprehensive, time- and cost-phased weapon system plan. The Chief of Ordnance received critical reports showing trends, slippage and other problem areas. Normally, he delegated the responsibility and authority for weapon systems management to the commanding general of a commodity command, who in turn appointed a qualified weapon system manager. The latter acted across-the-board with respect to the assigned weapon. The plans and program division provided a single source point of contact which resulted in

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<sup>25</sup> (1) Ltr, ACoFOrd to all Ord Commands, 8 Apr 60, sub: Reporting of Difficulties in Ord Weapon System Prog (RCS ORDGX-112), 00/60-UO-2045. (2) Ltr, CoFORD to all Ord Commands, 5 Jul 60, sub: Reporting Difficulties in Ord Weapon System Programs (RCS ORDGX-112), 00/60-UO-3795.

a cohesive weapons management system. The Ordnance Corps found this to be an effective management concept.<sup>26</sup>

### Weapons System Management in the Transportation Corps

Like any big business organization, the technical services continually sought to provide more effective management. One technique that the Transportation Corps employed was the application of systems management to new weapons, improved equipment, and even to services. The Corps used weapon systems management as a control mechanism or a tool for making decisions by charting specific actions within a set time frame. The number of weapons to which the Corps applied systems management revealed its wide use. Initially, the Corps limited its application of systems management to two new aircraft projects, the HU-1 Iroquois utility helicopter and the AO-1 Mohawk surveillance airplane. By the end of 1959, it had placed 11 types of aircraft, 3 aircraft power plants, and 2 amphibious vehicles under systems management.<sup>27</sup>

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Ltr, CofOrd to MDLC Planning Group, 15 Mar 62, sub: Weapon Sys Mgt.

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(1) Harry A Jacobs, "Systems Management: Making It Work," Armed Forces Management ( Dec 1959), pp. 36, 38. (2) Brochure, OCofT, 28 Apr 61, sub: System Management for Decision Making, in AMC Hist Ofc files. (3) CT Manual 8, 3 Apr 61, sub: Systems Management. (4) Memo, DCofT for Brig Gen D. B. Parker and other TC Staff Offices, 13 Apr 62, sub: Sys Mgt.

Early in 1959, the Chief of Transportation initiated, on a phased basis, a reorganization of his headquarters structure. To bring it into harmony with the DA program management structure, the staff of the Office, Chief of Transportation was regrouped around general functional program areas. The staff elements and responsibilities concerned with each major program area were brought, as far as possible, under a single Assistant Chief of Transportation.<sup>28</sup>

Because the functional organizational elements managed only segments of a weapons system, the Chief of Transportation felt that he needed a strong organizational element to maintain inter-program control and coordination. He believed that such a management technique would help him make decisions that were vital to the success of his mission.<sup>29</sup> By mid-June 1959, he established an Executive for Programs.<sup>30</sup> The effect was to bring various systems management elements of the Office of the Chief of Transportation under the Executive for Programs and to strengthen systems management efforts. The Office of the Executive for Programs served as the focal point

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<sup>28</sup> Historical Report, "Program Management A Tool of Command," 31 Jan 60, p. 30. This is one of a series of reports prepared by the TC historians under the general heading "TC in the Current National Emergency: The Post-Korean Experience."

<sup>29</sup> (1) Ibid. (2) Intvw, Author with Paul T. Culler, OCoFT, 4 Mar 63.

<sup>30</sup> TC GO 30, 12 Jun 59.

on programing matters, providing direction and guidance for formulating, executing, and appraising programs and for correlating resources. It also provided lateral, integrated analyses of the Corps' program and transportation systems and coordinated program and systems management matters involving two or more Assistant Chiefs of Transportation. The Corps defined systems management as the direction, evaluation, and control of a specific system to assure the timely and balanced meeting of a planned objective.<sup>31</sup>

The reorganization of the Office of the Chief of Transportation gave added impetus to the systems management efforts in the Corps. Not only was an Executive for Programs created, but the Corps established formal machinery and procedures for the application of the systems management concepts to services as well as to materiel programs. During the establishment of this machinery, the Corps provided schedules of events, a reporting procedure for feedback information, and a systems status report. The formats changed continually as techniques improved.<sup>32</sup>

As developed in 1959, the Chief of Transportation appointed a system manager for each major system. Assisted by a system manager

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<sup>31</sup>

(1) CT Manual 8, 3 Apr 61, sub: Systems Management, p. 1.  
(2) Historical Report, "Program Management A Tool of Command," pp. 31-32.

<sup>32</sup>

Brochure, OCoT, 28 Apr 61, sub: Systems Management for Decision Making. See introduction.

engineer, advised by management and working groups, and supported by program and activity directors, the system manager accomplished the objectives of his mission. With responsibility for all systems, the Executive for Programs provided the systems managers with engineers, furnished guidance on techniques, and assured that the systems fully supported the applicable DA and DOD programs.<sup>33</sup>

Using this machinery, the Chief of Transportation identified systems susceptible to this form of management and assured the implementation of the required interrelated actions. This he accomplished through the system manager who set forth the master plan, the objectives, and the schedules. Through the assigned engineer, the manager continuously monitored the time-phased actions, evaluated the progress, and adjusted the schedules to slippages and other changes. To assure guidance and control, he supported the master plan and schedules with back-up reports, progress charts, and appropriate visual aids. Two advisory committees, the System Management Group and the System Working Group, coordinated this work at the Office, Chief of Transportation level.<sup>34</sup>

Though still in the evolutionary stages at the end of 1959, systems management had a firm hold on the Transportation Corps. The

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<sup>33</sup>Historical Report, "Program Management A Tool of Command," p. 35.

<sup>34</sup>Ibid., p. 36.

Corps looked upon this type of management as a significant "break-through," and pointed out that it gave the staff a clear, overall picture of complex projects. This form of management further facilitated decision-making, aided in the effective application of manpower and other resources, and enabled the manager to anticipate problem areas and minimize the necessity for "crash" actions.<sup>35</sup>

Systems management, as applied in the Transportation Corps, involved the functions of research, development, procurement, training, maintenance, and supply. Only the seventh function, movements, had not been brought under systems management techniques by 1951 although susceptible to them.<sup>36</sup> By that time, weapon systems management in the Corps was being applied to two main classes of materiel projects -- surface systems and aircraft systems. In the surface systems, the Rolling Liquid Transporter and the amphibians, including the Barc and the Larc, were so managed. The aircraft systems involved those families established by the Army Aviation Review Board, including the combat surveillance airplane system, the utility tactical transport helicopter, the utility transport

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<sup>35</sup> (1) Ibid., pp. 36 - 37. (2) Harry A. Jacobs, "Systems Management: Making it Work," Armed Forces Management, (Dec 1959), pp. 36, 38. (3) Intvw, Author with Paul T. Culler, Hqs, OCT, 4 Mar 63.

<sup>36</sup> Brochure, OCofT, 28 Apr 61, sub: Systems Management for Decision Making, p. 2.

airplane, the transport airplane system, the transport helicopter, and the light observation aircraft. By 1961, Transportation Corps PEMA and RDT&E funds that were system-related amounted to 55 percent of the total. The remaining 45 percent included the funds required for the movement of people, operating the ports, and administrative overhead.<sup>37</sup>

A presentation of weapon systems management as practiced in the Transportation Corps was made to the Hoelscher Committee in 1961 by the Executive for Programs and received favorable comments from the chairman.<sup>38</sup> Although General Besson, then Chief of Transportation and later to become Commanding General, AMC, knew how weapon systems management worked in the Transportation Corps and knew both its weakness and its strength, that management system remained an example, or a forerunner, of product-oriented management introduced into the AMC. The resemblance, as well as the differences, between systems management in the Transportation Corps and project management in the AMC are reflected further in the pages of this study dealing specifically with project management in the AMC.<sup>39</sup>

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<sup>37</sup> Ibid., pp. 4, 5, 8, 12, 13.

<sup>38</sup> Intvws, Author with Benjamin Tabarini, Chinook Project Manager's Office, 4 Feb 63; with Thomas M. Harvey, AMC, 15 Mar 63; with James E. Beach, Deputy Chief, Chinook Project Manager's Office, 12 Mar 64.

<sup>39</sup> For background information and a basic bibliography on the weapon system concept, see report, U. S. Army Transportation Materiel Command, St. Louis, Mo. Sep 1961, sub: The Weapon System Concept.

## The Chemical Corps' Weapon Systems Management Plan

Like the Ordnance Corps and the Transportation Corps, the Chemical Corps, too, had used systems management. In February 1960, the Corps formally adopted a weapon systems management plan, the concept of which cut across the several functional lines, such as research and development, procurement and production, supply and maintenance, and training. The Chemical Corps had previously oriented its management to functions. The need for the new concept became evident in the fall of 1959 when the Deputy Chief of Staff for Logistics inquired into the possibility of rearranging budget programs to reflect costs on an item basis rather than on a functional one. For planning purposes, the Corps regarded the various chemical, biological, and radiological (CBR) agents as basic weapon systems and identified 28 such systems by name. These the Corps arranged in one of the following five areas: chemical warfare, biological warfare, radiological warfare, flame and smoke, and CBR<sup>40</sup> defense.

In introducing weapon systems management, the Chemical Corps did not alter basically its functional structure. Command authority

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(1) CMLC Reg 1-13, Feb 1960, sub: CBR Weapons Sys. (2) Ibid., 1-4, Sep 1960, sub: Identification of Weapon Sys.

for coordinating across functional lines remained in the hands of the Chief Chemical Officer. To monitor this coordination, he established a Program and Evaluation Office in the fall of 1959.<sup>41</sup>

The Corps began its weapon system management plan on a trial basis with the XV Weapon System (a lethal chemical). This experiment served as a review and a model for application of the plan to other weapon systems. Consequently, by October 1960, a pattern of review, based on actual experience, had already developed for use in applying this type of management. This concept of weapon systems management cut across the several functional activities, thereby supplementing horizontal management with vertical management. The Corps' Comptroller's Office provided the required fiscal and budget data for systems management. The system managers utilized the performance evaluation and review technique (PERT), which was well known from its successful application in the Navy's Polaris program. By providing the managers with computer-prepared summaries at regular intervals, the PERT pinpointed critical lags in the

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<sup>41</sup> (1) U. S. Army Chemical Corps Summary of Major Events and Problems, FY's 1961 - 62, pp. 21 - 26. (2) Intvw, Author with D. J. Shearin, Review and Analysis Division, AMC, 24 Feb 64.

programs and enabled the managers to trace the probable effect of these lags on the overall schedule.<sup>42</sup>

The Chief Chemical Officer had to make frequent policy decisions on major weapon systems. Under the new management philosophy, he could direct his efforts toward specific systems, review the status of his major mission assignments, and make timely and firm management decisions. In the past, there had been no definite procedure for determining the impact of such decisions on the remainder of the programs.<sup>43</sup> One of the greatest problems had been the stretching out of projects until the weapon was technologically obsolete by the time it was completed. Management that failed to keep abreast of the pace set by technology became obsolete too. With the introduction of weapon systems management, the Chief Chemical Officer felt that the Corps had reached a new milestone in its management effort.<sup>44</sup>

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<sup>42</sup>(1) Chemical Corps Summary of Major Events and Problems, FY's 1961 - 62, pp. 21 - 26. (2) CMLC Reg 1-4, Sep 60, sub: Identification of Basic Weapon Sys. (3) Ibid., 11-7, Jun 61, sub: Weapons Sys Mgt Br. (4) Ibid., 11-9, 8 Jun 61, sub: CMLC Weapons and Defensive Sys 5-Year Financial Plan. (5) Ibid., 11-3, 26 Sep 61, sub: Procedures Essential to Achieve a CMLC Weapons Sys Capability. (6) Ltr, Chief Chemical Officer to all CMLC Divisions and Field Installations, 2 Oct 61, sub: CMLC Reg No. 11-3.

<sup>43</sup>Presentation, D. J. Shearin, Office of the Chief Chemical Officer, before Advanced Officers Class, Fort McClelland, Ala, 7 Mar 61.

<sup>44</sup>(1) Ibid. (2) Presentation, D. J. Shearin, to Chemical Corps Advisory Council, Fort Detrick, Md., 20 Jun 61.

## Project Management in the Army Technical Services

Project management, as introduced in 1961, should be considered as a new phase of weapon systems management. The Secretary of Defense and, in turn, the Secretary of the Army directed the technical services to initiate this new phase. At the urging of the Secretary of Defense, in 1961, the Department of the Army made nine project manager assignments. In a staff meeting on 10 July, Secretary McNamara expressed a desire to have appointed a project manager, of the rank of colonel or above, for each major weapon system as had been done by the Chief of Ordnance only 5 days earlier when he assigned a project manager for the M-14 rifle.<sup>45</sup> He indicated further that he wanted to be kept informed of the names of such project managers so that he could call them directly when he needed immediate information. He emphasized, however, that such direct communication would not abridge the chain of command. Secretary of the Army, Elvis J. Stahr, Jr., was in full agreement with Secretary McNamara on the desirability of appointing project managers to significant programs. He requested that a list of programs to be

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See Ord Corps Order 21-61, 11 Sep 61.

project managed, along with the names of the designated managers,  
be submitted to him before the end of July 1961<sup>46</sup>

As an initial step toward carrying out Secretary McNamara's instructions, the Deputy Chief of Staff for Logistics, in coordination with the Deputy Chief of Staff for Operations and the Office, Chief of Research and Development, selected the following nine weapon systems for project managership: the HO-4 and HO-5 Light Observation Helicopters,<sup>47</sup> the Universal Integrated Communications System (UNICOM), the ADVENT Communications Satellite, the AN-USD-5 Medium-Long Endurance Surveillance Drone System, the M60 Main Battle Tank and the modification of the M48A1 Tank, the T-114 Command and

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<sup>46</sup> (1) Memo, SA for CofS, 21 Jul 61, sub: Proj Officers. (2) Memo, DCSLOG for CofOrd, et al., 1 Aug 61, sub: Proj Officer Assignments. (3) It should be pointed out that staff officers at Department of Defense and Army level used the terms "project management" and "weapon system management" interchangeably. See DA Letter, AGAM-P(M) 310.1 (16 Oct 61) DCSLOG, 18 Oct 61, DCSLOG to CG, AMC, et al., sub: Policy Guidance on Weapon/Equip Sys Mgt in the Army. Likewise, they frequently used the terms "project officer" and "project manager" interchangeably. In his memorandum of 21 Jul 1961, Secretary Stahr stated that Secretary McNamara was anxious for us to appoint a project officer for each of the significant programs." In the same memorandum, he quoted as follows from a 10 July 1961 memorandum of Assistant Secretary of Defense Thomas E. Morris: "Secretary McNamara commented that he desired a project manager of proper stature assigned to each major program. . . ."

<sup>47</sup> In early August 1961, the DCSOPS, DCSLOG and OCRD substituted the Mohawk combat surveillance airplane for this project. See Memo, DCSLOG for CofOrd, et al., 3 Aug 61, sub: Proj Officer Assignments.

Reconnaissance Vehicle, the Sheridan/Shillelagh Armored Combat Vehicle Weapon System, the M-14 rifle, and selected ammunition. Three of the Army's technical services were involved in these assignments -- the Ordnance, Signal and Transportation Corps. The Ordnance Corps had responsibility for the M60 tank, the T-114 vehicle, the Sheridan/Shillelagh weapon system, the ammunition family, and the M-14 rifle. The Signal Corps had responsibility for the UNICOM, ADVENT, and the surveillance drone. The Transportation Corps had charge of the Mohawk combat surveillance airplane. The charters for these projects were to be tailored for the specific circumstances and were to include the maximum delegation of authority then vested in the chiefs of the technical services, plus the additional responsibility deemed necessary to provide a balanced program that would insure that requirement schedules were met. <sup>48</sup>

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(1) Memo, DCSLOG for CofOrd, et al., 1 Aug 61, sub: Proj Officer Assignments. (2) Memo, Gen G. H. Decker, CS, USA, for SA, 21 Aug 61, sub: Proj Manager Assignments. (3) See the following Ord Corps Orders for the establishment of Project Manager Offices: 20-61, 11 Sep 61, sub: Office of Proj Manager, Rifle M14; 21-61, 11 Sep 61, sub: Office of Proj Manager, Shillelagh; 22-61, 29 Dec 61, sub: Office of Proj Manager, Selected Ammunition; 23-61, 11 Sep 61, sub: Office of Proj Manager, Tank M60 and Tank M48A1 Retrofit; 24-61, 11 Sep 61, sub: Office of Proj Manager, T114, T195E1, and T196E1; 25-61, 11 Sep 61, sub: Office of Proj Manager, Selected Armor Defeating Ammunition; 1-62, 3 Jan 62, sub: Office of Proj Manager, Mauler.

Among the criteria considered in the selection of a weapon system to be managed by a project manager in the technical services were the following: the need for accelerating the decision-making process; significant interest in the weapon system expressed by the Congress, the President, or the Secretary of Defense; the essentiality of the item to the Army mission, or to accelerating the modernization program; the high total dollar value of the system, or the presence of major managerial and technical problems. These problems might involve such factors as slippage in production, decline of item inventories because of urgent new requirements, significant deficiencies revealed in user tests, and significant problems in training, maintenance, or field operations.<sup>49</sup> The criteria used later in the selection of a weapon system to be project managed in the AMC were similar to those used in 1961 for selecting projects to be placed under special management.

The Chief of Staff determined the weapon systems to be placed under project management upon the recommendation of either the Deputy Chief of Staff for Logistics or the Chief of Research and Development. His decision to terminate a project manager assignment was based on one or more of the following criteria: the

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<sup>49</sup>(1) Memo, DCSLOG for CofOrd, et al., of 1 Aug 61, sub: Proj Officer Assignments. (2) CSR 1-23, 29 Dec 61, sub: Selection and Termination of Sys for Proj Mgt. (3) Log Dir 10-1, DCSLOG, 8 Mar 62, sub: Selection and Termination of Sys for Proj Mgt.

weapon system was fully operational and in use by a substantial number of units; operational experience indicated that there were no extraordinary technical problems; it was believed that normal supply channels could handle the distribution to field units; and the principal criteria governing the initial selection were no longer applicable. <sup>50</sup> The AMC later used similar reasons for terminating a project manager assignment.

In his instructions on project management, the Chief of Staff warned that the danger of overemphasizing this type of management had to be recognized, for routine but important tasks might be jeopardized through lack of attention. In withdrawing resources to expedite systems under project management, he cautioned that full consideration be given to the impact of this action on the execution of th work on other projects. <sup>51</sup>

According to the instructions of the Secretary of the Army, the project manager under the technical services was responsible for planning, directing, and controlling the work and associated resources involved in providing a weapon system to combat units or to its intended operational destination. This included all phases

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<sup>50</sup>  
(1) CSR 1-23, 29 Dec 61. (2) Log Dir 10-1, DCSLOG, 8 Mar 62, sub: Selection and Termination of Sys for Proj Mgt.

<sup>51</sup>  
Ibid.

of development, procurement, production, distribution, and support of a balanced program to insure that delivery and employment schedules were met. The manager's duties involved the exercising of continuing monitorship over all project funds related to RDT&E, PEMA, and Army Stock Fund, military construction, and portions of O&MA funds. In addition to the usual responsibilities of evaluating progress and insuring that quality standards were met, the project manager in the technical services was the focal point for resolution of problems related to his project among the military departments. Within his delegated authority, he called upon the representatives from the DCSLOG, DCSOPS, OCRD, and CONARC, as well as from the other technical services for the actions required to meet effectively the established objectives for the weapon system, and he could request participation of other Department of Defense agencies as might be appropriate, through the Office of the Secretary of the Army.

During the last half of 1961 and the early part of 1962, the Department of the Army extended project management to four more weapon systems beyond the original nine selected by the Secretary of the Army and his staff. For example, in October 1961, the

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Memo, SA for CS, 21 Jul 61, sub: Proj Officers.

Chief of Ordnance established the Office of Project Manager for the Mauler missile,<sup>53</sup> and in December created the Office of the Project Manager, Selected Ammunition.<sup>54</sup> Most of the managers under the technical services were continued as project managers in the enlarged and more powerful approach initiated by the AMC.<sup>55</sup>

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<sup>53</sup>(1) Ord Corps Order 1-62, 3 Jan 62, sub: Office of Proj Manager, Mauler. (2) Ord Corps Special Order 41, 25 Sep 61. (3) DF, Asst Exec Officer, OCO, to OCO Divs and Staff Offices, 14 Nov 61, sub: Directory of Proj Manager Offices.

<sup>54</sup>Ord Corps Order 22-61, 29 Dec 61, sub: Office of Project Manager, Selected Ammunition.

<sup>55</sup>Among the project manager assignments made by the Ordnance Corps in 1961 were the following: Lt Col Samuel M. Burney--the M60 Tank; Col J. A. Ulrich--Selected Ammunition; Brig Gen Elmer J. Gibson--the M14 Rifle; Col Harold N. Brownson--the Shillelagh missile; Col Jerome S. Jeffords--the T114, T195E1 and T196E1 Command and Reconnaissance Vehicle family; Col Leonard M. Orman--Selected Armor-Defeating Ammunition; Col John W. Koletty--the Mohawk surveillance system, and Col Norman T. Dennis (appointed in January 1962)--the Mauler missile. (See Ord Corps Special Order 41, dated 25 September 1961 and TC Special Order 55, dated September 1961.) In 1962, the three following Transportation Corps men transferred with their respective projects to the AMC and became deputy chiefs in the new project manager offices: Charles Brandon--Aircraft Weaponization, James Beach--Chinook, and Stanley Perkins--Caribou Project Manager's Office. The Signal Corps' Project Managers were as follows: William F. Spank--UNICOM; Brig Gen J. W. Johnston--ADVENT; and Col. Charles Reeves--USD-2 and USD-5 Drones. The Chemical Corps' Project Manager for the Chemical-Biological Project was Col M. R. DeCarlo.



CHAPTER IV  
PLANNING FOR PROJECT MANAGEMENT  
IN THE AMC

The Defense Management Picture in 1961

Background Observations

While the traditional organization of the military departments was in many ways inadequate, there was strong resistance to the creation of special organizational arrangements. This was overcome partially by bold action from the Department of Defense or high levels in the departments. All departments found it necessary to introduce special managerial arrangements and assignment of authority. In some instances, they delegated major responsibility for a weapon system program to a contractor and avoided the issue of strong in-house management.

Ultimately, it was the revolution in weapon technology, the long lead time, and the threat of weapon obsolescence that reshaped the Department of Defense rather than strong personalities. Secretary McNamara could speed the change, another secretary might retard it, but the Department needed to reshape its management

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techniques in order to catch up with weapon technology. Although the Army's technical services placed 13 weapon systems under a form of project management in 1961, this failed to achieve the desired goals because of the semi-independence of the technical services and the division of authority at staff level between the Deputy Chief of Staff for Logistics and the Office, Chief of Research and Development. A single high-level authority was necessary to assure proper time-phasing of all elements in research and development, fabrication, training, and operational procedures.

Furthermore, in previous years, the Department of Defense and industry had sponsored a whole family of electronic data processing systems to aid management. These systems made possible the rapid collection of detailed program data for decision-making which fostered a variety of management techniques. Each of the armed services developed its own approach for managing its weapon systems. No common management technique had been formulated.

Project management had been widely accepted within major defense industries. A 1961 survey of a number of defense industries

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1  
Presentation, by Herbert Roback, Staff Administrator, House Military Operations Subcommittee, Committee on Government Operations, at Fort Lee, Va., 12 Jul 62, sub: Congressional Interest in Weapon Acquisition.

2  
Philip Geddes, "The Year of Management Systems", Aerospace Management, (Mar 1962), ALMC Reprint ALM-1652-H, pp. 89-91.

found that there were at least three types of project management operating within industry -- strong, balanced, and weak. A concept was needed that would retain all of the advantages of big organization resources and technology, and, at the same time, get the complex projects completed. The organizational solution to this challenge had been identified under a myriad of terminology, such as project management, program management, and task force management. According to the 1961 survey, the total amount of funds involved in a project was not the determining factor as to whether the project manager was strong or weak. This depended upon the level at which the concept first appeared in the organization chart, the responsibility and authority delegated to the project manager, and upon the scope of the project or program placed under the authority of the project manager.<sup>3</sup>

According to the 1961 survey, a balance of power between the functional and project managers was considered to be the most suitable version of project management. This, the survey concluded, was particularly true where complex programs required many smaller tasks to be performed by the functional managers -- a situation

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<sup>3</sup> Booz, Allen & Hamilton, Field Survey Report of Organization Practice -- Aerospace Industry, Feb 1961. The participating companies were: Boeing, Chance Vought, Douglas, General Electric, Hughes, Lockheed, Martin, North American, and Thompson Ramo Wooldridge.

which most nearly described the Army Materiel Command, according  
to a 1963 AMC Board Report.<sup>4</sup>

### The Robertson Report

The Robertson Report on leadtime, prepared in 1956 by a group headed by Deputy Secretary of Defense Reuben B. Robertson, Jr., accelerated the interest in project management that continued into the next decade. This study was prompted by a United States Air Force report concerning Russian leadtime.<sup>5</sup> Secretary of Defense, Charles F. Wilson,<sup>6</sup> directed that the study be made. The study identified 21 major areas in which leadtime could be reduced, including the acquisition of additional test equipment for concurrent testing. The group interviewed over 200 DOD officials and over 100 representatives of aircraft manufacturing organizations.<sup>7</sup>

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<sup>4</sup>  
(1) Ibid. (2) AMC Board Rpt, 29 Nov 63, sub: Evaluation of New Management Concepts, pp. 29 - 31.

<sup>5</sup>  
(1) Rept, A Program for Reducing the Time Cycle from Concept to Inventory-Manned Aircraft Weapon Systems, prepared by Ad Hoc Study Group, 25 Jul 56, Deputy SECDEF Reuben B. Robertson, Jr., Chmn. This study was popularly known as the Robertson Report. (2) Intvw, Author with James N. Davis, OASD (I&L), 3 Apr 64.

<sup>6</sup>  
Memo, SECDEF to Secretaries of the Navy & Air Force and Assistant Secretaries of Defense, 30 Sep 55, sub: Ad Hoc Study Group for Manned Aircraft Systems.

<sup>7</sup>  
Robertson Report, pp. 1 - 8.

The Robertson Report reviewed the existing approaches to program management practiced by the Departments of the Navy and the Air Force and by private industry, including the Glenn L. Martin Company. Although strong project management had proved its worth in emergencies, the report concluded that it had become increasingly difficult to determine who had the decision-making authority in normal military management and that the armed services had come to rely on specialists who did not want the responsibility for decisions. The report outlined the actions required to eliminate the weaknesses of the existing structure and recommended the saving of time by more vigorous project management. The study group devoted its attention primarily to the problems of reducing leadtime, with the understanding that higher echelons would handle the problems relating to cost. Later emphasis on cost reduction, which caused extensive re-programing, tended to nullify the effects of the Robertson Report's recommendations on the reduction of leadtime.

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<sup>8</sup>  
Ibid., pp. 27 - 43.

<sup>9</sup>  
Ibid., p. 36.

<sup>10</sup>  
Ibid., pp. 27 - 43, 74 - 84.

<sup>11</sup>  
Intvw, Author with Charles Merriman, BuWeps, 7 Apr 64.

## The Davis Committee Study

In the spring of 1961, a task force at Department of Defense level, known as the Davis Committee, made an early attempt to formulate a common management technique, or approach, for managing complex weapon systems in each of the armed services. The study described the existing organization for managing weapon programs in the Departments of the Army, Navy, and Air Force, and assessed the impact of each type of management on the conventional organization and on contractors. The task force devoted major attention to weapon systems under project management.<sup>12</sup>

A brief analysis of the findings of the Davis Committee study will serve as a background for an understanding of the project management system established in the AMC. Although the study pointed out the reluctance of the lower echelons to establish special managerial arrangements, it found no evidence to support the viewpoint that project management was a luxury that could be afforded for only one or two major programs.<sup>13</sup>

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<sup>12</sup> Study, OASD (I&L), 1 Jun 61, sub: Management of High Priority Weapon Systems Programs Within the Military Departments. James N. Davis of the Office, Assistant Secretary of Defense (I&L) headed the group that made this study.

<sup>13</sup> Ibid., pp. 1 - 2.

According to the Davis Committee study, the Navy Department had one important case in which the authority of the Secretary of the Navy extended directly to the Special Projects Office. The Project Officer was a Vice Admiral, which resulted in the strongest example of project management since the Manhattan Project. On the other hand, the Departments of the Army and the Air Force each had multiple levels of policy and resources management. In the Department of the Army, there were the Secretary of the Army, the assistant secretaries, the Chief of Staff, the Chief of a technical service and arsenal commanders. In the Department of the Air Force, the "Red Line" channel permitted the program manager to bypass the intervening levels. While the Department of the Army originated this practice in a special case involving the development of the Jupiter in 1958, it withdrew this special channel in 1960.<sup>14</sup>

Although the Davis Committee study termed the Nike Zeus, the weakest project managed among the high-priority projects, it called the Zeus system one of the most difficult defense weapon tasks ever undertaken. In managing the Zeus system, the Office of the Chief of Staff and all of its functional elements were in the direct chain of command, as well as the Office, Chief of Ordnance. The Zeus

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<sup>14</sup>  
Ibid., p. 2. See also, James M. Grimwood, "Special Powers Delegated to the Commanding General of the Army Ballistic Missile Agency". (ABMA, Feb 1961), pp. 28-29.

Project Officer was a lieutenant colonel, who was five echelons below the Secretary of the Army. Consequently, the management of this missile system lacked the cohesiveness of the Navy Polaris project and the Air Force ballistic missile projects. Furthermore, the Zeus Project Officer had to exercise authority through the regular divisions of the Army Rocket and Guided Missile Agency, a segment of the Army Ordnance Missile Command. These divisions, in turn, dealt with the contractors. A separate chain of command out of the Office of the Chief of Ordnance handled contract negotiations and administration.<sup>15</sup>

Thus, at the technical-service level, the responsibility for the success of the Zeus program was not fully centralized. In this instance, the Department of the Army used the normal organizational channels instead of the special task force. Overall guidance came through the Chief of Staff, the DCSLOG, the OCRD and the Office of the Chief of Ordnance, which was organized functionally. However, the Davis Committee study used the term "smooth working" in referring to the relations between the Office of the Chief of Ordnance and the General Staff level, and it attributed the lack of any highly centralized, in-house control to the existence of a

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<sup>15</sup> Study, OASD (I&L), 1 Jun 61, sub: Management of High-Priority Weapon Systems Programs Within the Military Departments, pp. 2-4.

single, strong prime contractor. The Western Electric Company, with 15 years of Ordnance experience, exercised a major control over Zeus management. The Bell Telephone Laboratories, a subsidiary of Western Electric, also exercised strong technical control. The Davis Committee study concluded that a greater concentration of in-house authority and control would have been imperative had the contractor support been less experienced.<sup>16</sup>

One of the Davis Committee's conclusions was that a study of project management should be continued and completed by an objective team which would assess further the impact of the several approaches then in use on the permanent organization of the Department and on the contractors. This, the Committee believed desirable in order to formulate a statement of principles to be applied in managing high-priority programs. The Office of the Assistant Secretary of Defense was prepared to organize and supervise a team for this purpose.

Among the other recommendations of the Committee were the following: that the specially developed scheduling, planning, review, and control techniques employed by the Navy and the Air Force Departments be exploited by all military departments in a variety of programs, in which the Office of the Assistant Secretary of Defense

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Ibid., pp. 4-5

was prepared to participate with the assistance of the departments; that the DOD Comptroller should document the Navy Department's experience and provide guidance to all departments on the use of the management fund technique; that the application of PERT should be encouraged and that professional assistance should be obtained for that purpose; and that the revocation by the Department of the Army of the special delegations to the Commanding General of the Army Ordnance Missile Command be reconsidered, and that special attention be given to the benefits which might accrue from raising the rank and expanding the authority of the Zeus project director.<sup>17</sup>

The Davis Committee foresaw that several other matters relating to project management deserved special study and recommended that such studies be undertaken. For example, it believed that the extent of the delegation to program managers of responsibility for contracting and contract administration was worthy of special study. Among other areas proposed by the Committee for special study were the following: the conditions under which systems engineering contractors should be retained, such as the Vitro Corporation for the Nike-Zeus and the Space Technology Laboratories by the Air Force; and the point at which an organization like the Special Project

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(1) Ibid., pp 5-6. (2) Memo, COA for Maj Gen Frank S. Besson, Jr., 19 Feb 62, sub: OSD Study on Mgt of Complex Weapons Systems.

Office should be phased back to the regular organizational structure of the Department of the Navy, including the blueprinting of the method and proper timing.<sup>18</sup>

The Department of Defense took no immediate action to carry out the Davis Committee's recommendation that a common management technique, or approach, for complex weapon systems be formulated. Nevertheless, James N. Davis, of the Office of the Assistant Secretary of Defense (Installations and Logistics), who headed the study group in 1961, spearheaded a similar effort again in 1963.<sup>19</sup> As a result of this effort, Roswell Gilpatric, Deputy Secretary of Defense, requested the Assistant Secretary of Defense (Installations and Logistics) to lead a combined effort in policy consolidation and clarification to guide the armed services in managing major weapon systems. Secretary Gilpatric further requested that the Assistant Secretary assume the leadership in consolidating existing training activities and in developing a Department of Defense capability for training project management personnel.<sup>20</sup> In the spring of 1964,

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<sup>18</sup> Study, OASD (I&L), Jun 61, sub: Management of High Priority Weapons Systems Programs Within the Military Departments, pp. 5-7.

<sup>19</sup> Final Report, Defense Conference on Program Management, New London, Connecticut, 1963, p. 6-7.

<sup>20</sup> (1) Ibid. (2) Memo, DSECDEF for Secretaries of the Mil Depts et al., 19 Sep 63, sub: Weapons Program Mgt.

the Office of the Secretary of Defense began planning for the establishment of a defense-wide school for project managers and, with the help of the military services, drafted the basic policy direction on program management. By April the Wright-Patterson Air Force Base, in Ohio, had been selected as the location of this new school.<sup>21</sup>

### Early Views on the AMC Project Manager Concept

#### The Hoelscher Report

In October 1961, the Hoelscher Report concluded that the diversity and complexity of Army weapons had outgrown the bounds of the individual technical service responsibility. It concluded that no matter how the Department of the Army's new logistic system was structured, provision would have to be made for some form of system or project management at various levels. In the spring of 1961, the Davis Committee study had indicated the general path that should be followed in introducing special organizational arrangements for handling major weapon systems. In July of the same year, Secretary McNamara dictated a definite course when he requested that a project manager of proper stature be assigned to each major, high-priority

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<sup>21</sup> Intvw, Author with James N. Davis, OASD(I&L), 3 Apr 64.

weapons program. The Hoelscher Report cautioned, however, that a pure form of management which provided for complete directive authority to cut across functional organizational lines should be used only on high-priority items.<sup>23</sup> According to the report, the proposed Materiel Development and Logistics Command (MDLC) lent itself to across-the-board project management, since it retained cognizance over items during development and through the supply and support phases. The report, therefore, visualized the establishing of project managers outside of the chain of command for certain complex weapon systems.<sup>24</sup>

In analyzing the deficiencies in the existing weapon system management practices, the report reiterated that there were opportunities for conflict and confusion to arise from what it termed extensive, exceptional systems management. In the case of the Army Program System, assignment of responsibilities and resources were made through command channels to cover all resources within the channel. Under project management, such assignments were made to selected points of authority for the employment of consumption of

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(1) Memo, SA for Army CS, 21 Jul 61, sub: Project Officers. (2) Memo, DCSLOG for CofOrd, CSigO, and OCofT, 1 Aug 61, sub: Project Officer Assignment.

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Hoelscher Report, Part IV, Vol I, p. IV-10.

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Ibid., p. IV-67.

resources for a single end product. In a situation with limited resources, particularly in peacetime, the Hoelscher Report pointed out that both the functional and project management systems required that priorities be determined between projects, especially if more than one project was to be system managed. In that case, the decision could be made only by an authority above both the project manager and the functional operator. Moreover, the report concluded that if several projects were system managed, the degree of attention given to each one would depend upon priorities among projects under special management.

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In comparing the alternate methods of management, the Hoelscher Report noted that in the functional approach the authority and responsibility remained with the normal staff elements, while under the project management approach, the functional element became "service"-type activities and authority and responsibility were taken from the normal line and staff elements and placed with the project manager. In summarizing the advantages and disadvantages of project management, the report concluded that, based on limited use on high-priority projects, this type of management would result in an appreciable saving of time in the completion of projects and a greater concentration of talent and resources on the most critical

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Ibid., Part II, pp II-C-8 to II-C-10

part of the defense program. The disadvantages centered around the ill effects on all items not project-managed, the relative extravagance in the utilization of funds and manpower, and in the disruption of normal organizational relationships. Under conditions where a number of items were project managed, the report observed that the degree of attention given each one rested as significantly on the priorities between projects as on the use of the project manager in the organization.

The Hoelscher Report did not provide specifically for establishing project managers in the MDLC. However, one of the organizational proposals provided "an optimum climate" for project management and permitted this special management to be injected into any level of the new command. The Report outlined several organizational patterns including one which called for the delegation of specific authority to the Deputy Commanding General for directing and controlling project management activities.

#### MDLC Preliminary Implementation Plan

In April 1962, the MDLC Planning Group incorporated the concept of project management in its Preliminary Implementation Plan. It

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Ibid., Part II, p. II-V-10.

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(1) Ibid., I, 96, 107, 134. (2) MDLC Preliminary Implementation Plan, 27 Apr 62, p. I-1.

stated that project managers would exercise the full authority of the Commanding General over all phases of research, development, procurement, production, distribution, and logistical support of designated weapon systems. The manager was to plan, direct, and control all functions and resources involved in developing the weapon system, to provide surveillance over related industrial activities, and to coordinate with other government agencies on matters relating to the designated weapon.

According to this plan, the Commanding General of the MDLC reserved the authority to designate project managers. Whenever circumstances dictated, he might single out a particular weapon system for project management. In turn, the manager was to report directly to the Commanding General and was to exercise full line authority over all processes from conception through employment. This was to be the project manager's sole and full-time assignment and he was to be the focal point for all actions associated with his project.

Normally, the project manager and a minimum staff were to be located at the installation where the majority of the day-to-day decisions concerning his project had to be made. In certain selected instances, the Commanding General might specify that the

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MDLC Preliminary Implementation Plan, 27 Apr 62, p. A-30.

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Ibid., p. A-29

project manager be located at Headquarters, MDLC, particularly where actions involved the agencies of other military services or decisions at the Department of Defense level. In these instances, the project manager was to have appropriate representation located at key installations outside Washington, D. C., as required. When the project manager was located outside the Washington area, he was to have a project manager staff officer (PMSO) at Headquarters, MDLC, to act for him, to serve as a focal point for all information concerning his project, and to coordinate and resolve conflicts to assure uninterrupted progress. The PMSO was to have direct access to the Commanding General, MDLC, when acting for his project manager. The staffing requirements of each project manager's office were to be determined on an individual basis.<sup>30</sup>

#### Contribution of United Research Incorporated

Early in 1962, the United Research Incorporated prepared a comprehensive study popularly known as the Cherington Report,<sup>31</sup> which dealt with the organization for, and management control over,

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<sup>30</sup> Ibid., p. A-29.

<sup>31</sup> (1) Rept, United Research Incorporated for ASD(I&L), Jan 1962, sub: Extension of Special Organizational Patterns and Management Techniques to Additional Weapon Systems. Hereafter briefly referred to as Cherington Report. (2) Dr. Paul Cherington, of the Harvard School of Business Administration, established the United Research Incorporated.

major weapon systems. The report defined the term "projectization" as the bringing together of substantial resources, money, technical ability, and facilities to achieve a particular program objective. This report, which AMC administrative personnel considered to be a valuable reference on project management, dealt with the unique character of high-priority defense projects. It further dealt with the effect of these projects on other programs and with the general application of project management to weapon systems. It pointed out that the armed services were influenced in their management systems by the contractor relationship which existed. For example, where there was a strong contractor, such as in the case of the Nike Zeus, the management authority might be delegated to the contractor, while in other instances the management might be done by the government agency or by an independent engineering contractor. The report clearly showed that the big missile management agencies succeeded in reducing markedly the planned target dates. Although the theme of the report was the extension of some form of project management to additional weapon systems, its broad nature limited detailed recommendations for specific programs.<sup>32</sup>

The Cherington Report was essentially a continuation of the Davis Committee study of the spring of 1961 on the organization and

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<sup>32</sup> Cherington Report, p. 1-1.

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management of six high-priority weapon programs. The United Research Incorporated had access to the files and working papers of the Davis Committee. After examining the Committee's work, it concluded that no single method of management or type of organization was being used for all of the six high-priority weapon systems; that the patterns of organization reflected the thinking of the different services which were developing the weapon system; and that the management techniques were dictated by the size, complexity, and priority of the weapon system.

In examining the current organizational patterns and management techniques of the weapon programs, the Cherington Report considered the following basic questions: what are the common and unique characteristics of the patterns and techniques; to what extent can performance on schedule, quality, and cost be traced to these organizational and management patterns; what effects have these special arrangements had on other portions of the organization; and are these organizational patterns and management techniques generally applicable to other programs of either comparable or lower priority? With respect to the success of the previous special management techniques, the Cherington Report concluded that the technique

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See above, pp. 102-108

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Cherington Report, pp. i-iii, 1-2.

had contributed in a major way to the success of these programs, especially in reducing the leadtime; that there was little evidence that these special techniques had an adverse impact on the functional organizations; that the Program <sup>Evaluation</sup> Analysis and Review Technique (PERT) should be extended where careful studies so indicated, including a test to see if that technique was in fact achieving its basic purpose; that the Department of the Army should take steps to see that the nine recently appointed project officers were more than "points of information"; and that further project management of Army programs should be carried out as a part of the general realignment of the technical services.

While the Cherington Report concluded that the special management techniques had contributed to the success of the high-priority programs, it left no doubt that the high priority of these programs had a "favorable impact" on their success. Nor should it be expected, according to the report, that low-priority programs, using the same techniques, would have comparable records. The report did not present sufficiently detailed information to constitute a final blueprint for future action. There were a substantial number of complex questions involved in the Department of the Army-Office of the Secretary of Defense relationship. With respect to

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Ibid., pp. 1-1 to 1-12.

this relationship, the report concluded that if the Office of the Secretary of Defense continued to exercise an increasing role in the functional decisions concerning major weapon systems, it would have to clarify its relations to the Department of the Army and to the project management structure. The Cherington Report provided a basis for further detailed study of project management.<sup>36</sup>

On 15 April 1962, General Besson conferred with Dr. Cherington and a representative from the Defense Directorate of Research and Engineering on project management. General Besson looked over a number of weapon system projects with several factors in mind, such as dollar value, technical complexity, and interest by Congress. Later in April, Dr. Cherington outlined in some detail, for MDLC personnel, his overall concept of project management. This covered such factors as project manager qualifications and responsibilities, the types and cost of weapons that should be project managed, and personnel requirements. Briefly, as outlined, the objective was to establish project managers with authority and responsibility for development, production and distribution of a weapon. This was in line with the thinking of the Office of the Secretary of Defense on centralized or vertical management. At the same time, this project structure would do the least possible harm to the MDLC functional organization. It was assumed, that for some of the weapon

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<sup>36</sup>Ibid., pp. 1-8 to 1-12.

systems, the project manager would report directly to the Commanding General of the MDLC. According to Dr. Cherington, the upper limit for direct reporting was about six. All others would report to the commanders of the subordinate commands. The added feature of Red Line reporting to the Commanding General, MDLC, was to be used. In this type of reporting, the project manager in the field would report direct to the Commanding General, MDLC, without consulting the commanding general of the subordinate command where he was located. Admittedly this procedure was "an extremely ticklish one", and should be used sparingly.<sup>37</sup>

In his diagnosis of the project management concept Dr. Cherington warned that the "proliferation of vertical organizations" without a system of priorities could lead to serious difficulty. He recalled that previous project management had been limited to a small number of projects of unquestioned priority. He further warned that no general model could be applied automatically to a particular weapon or family of weapons, but that each assignment

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(1) Intvw, Author with James Maguire, United Research Incorporated, 31 Jan 63. (2) Intvw, Author with Dr. Paul W. Cherington, United Research Incorporated, & Harvard School of Business Administration, 12 Aug 63. (3) Memo, Paul W. Cherington for Brig Gen E. P. Campbell, CS, AMC, 23 Apr 62, sub: Project Offices.

would require considerable study, depending upon the dollar value, technical complexity, urgency, and functional organizations involved.<sup>38</sup>

To aid the MDLC in planning for project management, Dr. Cherington presented a brief summary of factors governing the establishment of project management for hypothetical weapon systems. He presented, for example, Weapon Able, which might be a complex, medium sized, ballistic missile with a total program cost of \$1 to \$3 billion; Weapon Baker, which was not a technically difficult weapon, was relatively less urgent than Weapon Able, and would cost approximately \$1 billion; and Weapon Dog, a small system involving \$50 to \$60 million over a period of 3 years, such as the initial production of electronic sensing gear, or the development and early production of a new rifle. In summary, Dr. Cherington presented the following examples of project offices with variable characteristics:<sup>39</sup>

<u>Size of Program</u>	<u>Ultimate Rank of Project Officer</u>	<u>Report to</u>	<u>Initial Personnel</u>	<u>Peak Personnel</u>
\$2-3 Billion	Maj Gen	CG, MDLC	25	400-500
\$800 Million- 2 Billion	Brig Gen	CG, Sub Comd	10	250
\$200-500 - Million	Col	CG, Sub Comd	5	25
Less than - \$200 Million	Lt Col	Comdr, Special- ized Agency	3	12

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<sup>38</sup> Memo, Paul W. Cherington for Brig Gen F. P. Campbell, CS, AMC, 23 Apr 62, sub: Project Offices.

<sup>39</sup> Ibid.

In mid-May 1962, the United Research Incorporated signed a contract with the AMC for the purpose of conducting a project managers' course at Fort Lee, Va., in June and July 1962. After that time, the AMC continued to employ this firm on tasks relating to project management. For example, in the last half of 1962, United Research made presentations to the AMC subordinate commands on how the system worked, reviewed the tables of distribution, and made a detailed study of the Sheridan/Shillelagh project. During 1963, the firm studied the operational practices and locations of the AMC managers and assisted with conducting the AMC Commanders Conference at West Point, N. Y., in July.

#### Role of AMETA

Although project management had been approved as a key management tool for the new Command, the planners had as yet provided no official vehicle for describing in detail the responsibilities and reporting required to establish and control the project managers. Brig. Gen. Fred P. Campbell, Chief of Staff of the AMC, took the initiative in setting up the project managers in April of 1962. General Campbell proposed to hire a management consultant and to provide, a training school for project managers.

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Intvw, Author with James I. Maguire, 31 Jan 63 and 23 Mar 63; and with Dr. Paul W. Cherington, 12 Aug 63.

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Intvw, Author with Col Paul A. Feyereisen, DCS, 27 Feb 63.

On 9 June 1962, Col. Paul A. Feyereisen, Deputy Chief of Staff, met with a group of selected key officers and civilians for the purpose of reducing to writing the operational principles on project managership which would prevail within the Command. Among those present were representatives from the Headquarters, AMC, the Ordnance Management Engineering Training Agency (OMETA), the Signal Corps Logistics Evaluation Command, the Office of the Chief of Ordnance, and the Army Ordnance Missile Command. As a result of the day-long session, the group prescribed key principles, explored procedures, and designated the OMETA to develop a set of interim controls for project management within the AMC. On 12 June the Command published its operational concept of project management.

By means of a tremendous coordinated effort during the 3 weeks following the 9 June planning meeting, the OMETA, later redesignated the Army Management Engineering Training Agency (AMETA), prepared an interim procedure for project managers. Approved by General Besson, it represented his direction for initially implementing

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(1) Ibid. (2) MFR, DCS, 9 Jun 62, sub: Management for Specialized Projects Within AMC.

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(1) AMC Planning Directive 23, 12 Jun 62, sub: AMC Concept of Project Management. (2) Intvw, Author with Col Paul A. Feyereisen, 27 Feb 63.

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The Ordnance Management Engineering Training Agency (OMETA) became the Army Management Engineering Training Agency (AMETA) on 1 August 1962. See DA GO 57, 27 Sep 62.

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this technique. The interim procedures were used at the project manager's first training course at Fort Lee, Va., during the period 27 June - 12 July 1962.

During the ensuing year, under the guidance of the Special Assistant for Project Management, AMC, the AMETA devoted its major efforts to on-site training and assistance to all AMC project managers, to the design of the total decision-making process for project management, and active participation in the Defense-directed PERT/COST test on the Mauler Missile. After preparing a second interim procedure for project managers in January 1963,<sup>46</sup> the Agency conducted training in those procedures at the field installations where the various offices were located. The new interim procedures added other features of PERT/COST, included technical performance, expanded the network and showed a simplified work breakdown structure, and established the first common milestones. This was the AMC's first attempt to standardize significant or key milestones<sup>47</sup> for all weapon systems.

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<sup>45</sup>  
AMC Planning Directive 32, 27 Jun 62, sub: Interim Proj Mgt Procedures for the Period 1 August 1962 - 1 July 1963.

<sup>46</sup>  
AMCR 11-7, Jan 1963, sub: Interim Proj Mgr Procedure. This regulation superseded AMC Planning Directive No. 32.

<sup>47</sup>  
(1) Intvw, Author with Donald J. Porter, Chief, Dept of Management Planning, AMETA, 10 Apr 63. (2) Brochure, AMETA, 25 Feb 63, sub: On Site Orientation & Training.

After the publication of the interim procedure in January 1963 the AMETA concentrated its efforts on the design of the total decision-making process. The Agency prepared the total system in the three following volumes: Volume I -- Planning and Control Guide for Executives; Volume II -- Planning and Control Techniques on Procedures for Project Management; and Volume III -- Master Plans and Reports (PM<sub>2</sub>P) for Project Management. Later in the year, the AMC published these three volumes, which replaced all previous procedures and techniques for project management within the Command.<sup>48</sup>

The Department of Defense had directed that each of the Armed Services actually test the DOD-NASA PERT/COST Guide, in the process of the systematic development of the technique. The Mauler PERT/COST application, in which the AMETA participated, outlined much of the work that would have to be done in placing the new concept into operation. During the summer of 1962, in connection with this PERT/COST application to the Mauler weapon system, the AMC assumed the technical supervision of the contract that had been awarded to

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<sup>48</sup>

(1) Ibid. (2) AMCR 11-16, Vol I, Aug 1963; AMCR 11-16, Vol II, Aug 1963; AMCR 11-16, Vol III, Nov 1963. The AMC published a draft of Volume III on Master Plans and Reports (PM<sub>2</sub>P) in August 1963. (3) Presentation, AMETA before Project Management Class, Fort Lee, Va., 3 Jul & 18 Oct 62, sub: Interim Project Management Procedures. (4) Presentation on Project Management, by AMETA, before Maj Gen F. S. Besson, Jr., Hqs, AMC, 15 Jun 62.

<sup>49</sup>

DOD and NASA Guide, PERT/COST, OSD, NASA, Jun 1962.

the Management Systems Corporation of Cambridge, Mass., in April 1962, by the OCRD for the development of Department of the Army management information system. The AMC extended the contract to cover the PERT/COST application, and appointed James O. Jensen of the AMETA as technical supervisor of the contract and chairman of the PERT/COST implementation team.

The AMC integrated this application as appropriate with the total project management decision-making objectives. The AMETA prepared a work breakdown structure and developed networks with key milestones to serve as a model. Also, the Agency briefed the participating installations and, with the aid of the Management Systems Corporation, conducted a training course on the PERT/COST system. The excellent cooperation from all participating installations was an indication of the enthusiasm with which the AMC pursued this PERT/COST test on the Mauler missile system.

The Department of the Army selected the Lance Missile (formerly Missile B) for the application of the PERT/COST techniques,

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(1) Intvw, Author with Donald J. Porter, AMETA, 10 Apr 63. (2) AMETA Historical Summary, FY 1963, pp 4-5. (3) Mauler PERT/COST Application Briefing, by AMETA to ASD (I&L), 9 Oct 62.

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(1) Mauler PERT/COST Application Briefing, for ASD (I&L), 9 Oct 62. (2) Mauler PERT/COST Application Briefing, for Maj Gen F. J. McMorrow, CG, MICOM, 4 Jan 63. (3) Intvw, Author with Miss Doris Rueter, AMC Data Systems Office, 13 Sep 63.

starting with the project definition and technical performance phases.<sup>52</sup> The Lance development began at a time of managerial revolution in the Department of Defense and, therefore, most of the new management techniques were applied to this missile system. The integrated management control system explicitly focused attention on cost, time, and performance from the planning and review viewpoint. Lance was the first Army program to use these techniques for the entire weapon development, including the network by which schedules were planned and the cost and time estimated. In the program definition phase, the AMC introduced the contractors to the project management concept. These new management techniques enabled the government and industry to make penetrating examinations of specific approaches and gave confidence that the one selected offered the best compromise in performance, cost, safety, and reliability.<sup>53</sup>

These were not new techniques of management. But the integration of these techniques with the basic theme of project management and the concept of a total management system were new to the Army. The planners believed that these techniques and procedures when

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<sup>52</sup> AMETA presentation to Project Management Class, Fort Lee, Va., 25 Feb 64.

<sup>53</sup> Lance Technical Development Plan, RCS CSCRD-21(RD), U. S. Army Missile Command, 1 Aug 63.

placed into operation would result in reliable data that would allow project managers to make rapid and correct decisions commensurate with their authority.

### The AMC Activation Plan

The AMC Activation Plan of July 1962 made provision for singling out particular weapon systems for special management. Recommendations for this specialized management could be submitted by commanding generals of commodity commands or directors in Headquarters, AMC, but the Commanding General of the AMC reserved the authority to designate the systems to be project managed and to name the project managers, subject to approval at the Department of the Army staff level.<sup>54</sup>

The philosophy governing whether a weapon system should be selected for project management had been set forth in a Chief of Staff Regulation in December 1961 and in a letter in October of that year.<sup>55</sup> According to the Chief of Staff Regulation, recommendations for

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<sup>54</sup>

AMC Activation Plan, Jul 1962, pp. 4-5

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(1) DA CSR 1-23, 29 Dec 61, sub: Selection and Termination of Sys for Proj Mgt. (2) TAG Ltr, AGAM-P(M) 310.1, 16 Oct 61, DCSLOG, sub: Policy Guidance on Weapon/Equip Sys Mgt in the Army.

placing weapon systems under project management had to be approved by the Chief of Staff. General Besson recognized this requirement in August 1962 when he requested approval of 30 projects and their charters, and submitted a proposed draft of a revision of the October 1961 letter.<sup>56</sup> Of the 30 projects recommended for approval, 12 had been previously approved by the Chief of Staff. On 30 August 1962, the Chief of Staff approved the additional systems, their charters, and the revision of the October 1961 letter.<sup>57</sup>

The Activation Plan listed the following six conditions to be considered in designating a weapon system for project management: the importance of the weapon system to the defense of the nation; the urgency of getting it into the hands of the users; the interest evidenced by the Congress, the Secretary of Defense, the Secretary of the Army, or the Chief of Staff; the complexity of the weapon system, which might require participation by two or more commands; the relation of the weapon to major Army modernization objectives; and the dollar cost of the weapon system. According to the Plan, the project manager could demand the assistance of all commands and activities. The project managership could be terminated when the weapon was delivered to operational units, or when the principal

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<sup>56</sup>Ltr, CG, AMC, to CS, USA, 3 Aug 62, sub: Project Managers in AMC.

<sup>57</sup>Ltr, DCSLOG to CS, 30 Aug 62, sub: Project Managers in AMC.

criteria governing the selection of the system for project manage-  
ment no longer applied.<sup>58</sup> By the time the AMC became operational  
on 1 August 1962, the basic concept of project management had been  
outlined.<sup>59</sup>

### Training School for Project Managers

The decision to adopt project managership in the AMC created an immediate need for officers and civilians trained for the key project staff positions. In order to meet this demand, the Command announced, in May 1962, its plan to conduct a 30-day course in project management for approximately 60 key individuals. Since the AMC was to become operational on 1 August, and would assume responsibility for high-priority Army projects, it was essential that trained personnel be immediately available. Because the negotiation of a contract would have consumed most of the time from mid-May to 1 August, a sole source contract had to be placed with a firm that was familiar with the concept of project management. The only firm familiar with this management technique was the United Research

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AMC Activation Plan, Jul 1962, pp. 4-5.

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Intvw, Author with Col Paul A. Feyereisen, DCS, AMC, 27 Feb 63.

Incorporated, by virtue of a recent study it had conducted in this area for the Department of Defense.<sup>60</sup>

The United Research Incorporated organized and presented the first project managers course, 18 June - 14 July 1962, with the aid of a subcontractor, Harbridge House, Inc., and the help and concurrence of personnel from the AMC.<sup>61</sup> During the first course, the AMETA presented the interim control procedures for the project management concept. The Army Logistics Management Center (ALMC) at Fort Lee, Va., provided housekeeping support for the first course and conducted the second 4-week training course at Fort Lee in October and November 1962. Fifty-seven students attended the first training course and 47<sup>62</sup> attended the second.

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(1) Ltr, Brig Gen Fred P. Campbell, CofS, AMC, to DCSLOG, 21 May 62, sub: Training for Project Managers, AMC Central Files, 250/15, Project Managers, 1962. (2) 1st Ind, DCSLOG to Commandant, ALMC, Fort Lee, Va., 23 May 62, same sub. (3) 2d Ind, Actg Commdt, ALMC, to DCSLOG, 28 May 62, same sub. (4) 3d Ind, DCSLOG to CG, AMC, 28 May 62, same sub. (5) 4th Ind, Director, P&T, AMC, to DCSLOG, 28 May 62, same sub. (6) Memo, General Campbell for CofOrd, 4 Jun 62, sub: Interim Information and Data System for AMC Project Managers.

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A Report on the First Project Managers Course at the Army Logistics Management Center, Fort Lee, Va., Jun 18 - Jul 14, 1962, prepared by United Research Incorporated, pp. I-1 & I-2.

62

(1) ALMC Annual Summary, FY 63, p. 25. (2) DF, Director, P&T, AMC to CofS, 25 Jun 62, sub: Assignment of Project Managers to Training Course. (3) DF, Special Assistant for Project Management, AMC to CofS, AMC et al, 7 Sep 62, sub: Second Project managers Course.

The purpose of these courses was to expose the students to the concepts of project management and to the technical analysis, planning and decision-making process of such management alignment. Additionally, the latest policies of the Department of Defense, the Department of the Army, and the AMC were presented on the management of weapons acquisition and the students were familiarized with the interservice concepts of vertical management.<sup>63</sup>

Of the personnel attending the first course at Fort Lee, 18 had been designated as project managers of selected Army weapons and equipment. Most of the remaining 39 attending the course were personnel who were to have close association with Army projects when the AMC became operational. Some of these individuals had been designated as project management staff officers (PMSO's) or key personnel in project offices. The course was organized to tie in with the specific concept of project management adopted by the AMC.<sup>64</sup>

Because of the part that project management played in the reorganization of the Department of the Army, and because the students realized that their projects would become operational soon after the close of the course, the first project managers course was unique in a number of ways. For example, it was possible to secure an imposing

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<sup>63</sup>

ALMC, Annual Summary, FY 63, p. 25.

<sup>64</sup>

A report on the First Project Managers Course at ALMC - Ft. Lee, Va., June 18 - July 14, 1962, p. I-1.

list of top-ranking individuals from the armed services, the Office of the Secretary of Defense, and industry to make presentations. The students were preoccupied with the practical problems they could foresee arising after 1 August 1962, and they were especially concerned with the limits of their authority under project management. They devoted a considerable amount of time to the question of staffing and organizing the project offices in various ways and locations. Inevitably, considerable attention was devoted as well to technical problems, programming, and budgeting.<sup>65</sup>

Because the first training course was presented under an accelerated time table, and since many AMC policies were being formulated at that time, a high degree of flexibility had to be maintained in the teaching schedule and curriculum. None of these conditions were expected to persist in subsequent training courses.

Another feature of the course was a visit to the Air Force Ballistics System Division and Space Systems Division in Inglewood, Calif., and to the Martin Plant in Orlando, Fla. During these visits, the Air Force presented an elaborate series of high-level briefings on the management of its missile programs. The teaching materials for the AMC project manager training course drew heavily from the

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<sup>65</sup>  
Ibid., p. I-2.

other agencies, including the Air Force, the Navy and the National  
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Aeronautics and Space Administration.

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(1) Ibid., I-2, I-3, II-5. (2) Ltr, CG, AMC, to Gen B. A. Schriever, CG, AFSC, 31 May 62, sub: Visit of Project Managers to USAF Installations. (3) Ltr, SGS, AMC, to Commandant, ALMC, 27 Jul 62, sub: Project Manager Course. (4) DF, Sp Asst for Proj Mgt to all Divisions and Staff Offices, 20 Sep 62, sub: Second Project Manager Course.

CHAPTER V  
SCOPE AND OPERATION

Scope of Project Management in AMC

Project management in the AMC became operational on 1 August 1962 along with functional elements of the Command. A June 1962 planning directive had set forth the criteria for selection of the items to be managed, provided guidelines for development of a detailed management system, and named a list of 27 items to be project managed. By 1 August, the AMC had added three more projects for this special type of management. The Command then undertook the fantastic task of putting these 30 projects under separate project managers to control the management and reduce the lead time. Each project manager had full authority to act for the AMC Commanding General.<sup>1</sup>

This action by the AMC was the broadest application of the project management concept within the Armed Services. The 30 project-managed systems represented \$2.2 billion worth of weapon developments.<sup>2</sup> These 30 projects therefore gave the Commanding General,

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<sup>1</sup> (1) AMC Planning Directive 24, 12 Jun 62, sub: AMC Concept of Proj Mgt. (2) Ltr, AGAM-P(M) 310.1(13 Sep 62) DCSLOG, to CG, AMC et al., 28 Sep 62, sub: Policy Guidance on Weapon/Equip Sys Mgt in the Army.

<sup>2</sup> "Army Weapons Systems Chiefs Named," Armed Forces Management, (Sep 1962), p. 20.

AMC, immediate control of 50 percent of the yearly funds allocated to the Command for research, development, and procurement of weapon systems. Strong emphasis on project management gave the Commanding General a standardized management system at the outset and enabled him to meet the 1 August 1962 activation date and still keep a tight control over the organization.<sup>3</sup>

### Types of Projects

The weapon systems involved covered a broad front in aviation, guided missiles, combat and general-purpose vehicles, rifles, ammunition, aircraft weapons, chemical agents, electronic communications, self-propelled guns and howitzers, personnel carriers, and weapons for special warfare. Some of the weapons under project management were in the research and development phase, while some, such as the M-60 tank, the M-14 rifle, and the Iroquois helicopter, were in quantity production and had been deployed to the troops in the field.<sup>4</sup>

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<sup>3</sup> (1) Speech, Lt Gen Frank S. Besson, Jr., to National Advanced Technology Conference, Seattle, Wash., 5 Sep 62, sub: Project Management Within AMC. (2) Lt Gen Frank S. Besson, Jr., "I Don't Expect Project Managers to Keep Me out of Trouble," Armed Forces Management, (Oct 1962), pp. 18-19. (3) C. W. Borklund, "People and Project Managers," ibid., (Oct 1962), pp. 22-24.

<sup>4</sup> One-Line Definition of Project Managed Items, Nov 1963, prepared by AMC Sp Asst for Proj Mgt.

Although nearly all of the projects under project management involved a weapon system, a few were not readily identified in that category. For example, on 1 August 1962, General Besson designated the Commanding General of the Deseret Test Center, located at Fort Douglas, St. Lake City, Utah, as Project Manager of Project Deseret. Under this project, the Department of the Army had the tri-service responsibility for chemical-biological testing. Experience had indicated that this effort probably could be accomplished best under project management. Deseret was a testing organization and did not develop any item. Essentially, its product was a test report which provided desired information to the requesting agencies.<sup>5</sup>

Unlike most other project manager offices, the M-113 Co-Production Project had a mission of international character and involved a completely accepted item that was already in production. Although the M-113 Project Manager did not report through the Special Assistant for Project Management, nevertheless this item was under a form of project management. Late in 1962, the Italian Government, after conducting extensive tests of various personnel carriers, decided to purchase a large quantity of M-113, armored, personnel carriers which were produced in the United States.

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<sup>5</sup> (1) Ibid. (2) TWX GS-205, CG, AMC, to Proj Manager, Proj Deseret, 31 Jul 62. (3) Working Papers, Hqs, Deseret Test Center, 31 May 63.

Thereafter, the Italian Government proposed to the United States that arrangements be made to produce the M-113 personnel carriers in Italy. Following discussions between representatives of the two governments, officials signed a memorandum of understanding relating to the production of this personnel carrier. In principle, the two nations agreed on the production in Italy on a progressive basis.

As a basic document for the program, the co-production agreement was unique in that it permitted the Italian and American industries to make many of the necessary arrangements. The two governments had to insure that the carriers produced in Italy were of appropriate quality and permitted maximum interchangeability of parts with carriers produced in the United States. In December 1962, the Assistant Secretary of the Army for Installations and Logistics designated the AMC as the agency to carry out the M-113 co-production program and directed that a project manager be appointed to insure a smooth transition of the program to the advantage of both governments. On 21 December 1962, the Commanding General, AMC, appointed Lt. Col. Francis E. Abrino as project manager of the M-113 Co-Production Project, and on 10 January 1963 assigned the project to the AMC Mutual Security Office. The specific procedures that applied to the other AMC project managers were not applicable to the project manager of the M-113 co-production program, but like all other managers,

the latter had complete control of his project. In many ways the management of this project was unique.

Project management situations varied widely with the type of item, the number of agencies involved, the amount of funds, and the number of users. The project manager tailored his organization to accomplish best his management problems. The personnel strength varied from a few employees in the Project Manager's Office for Special Warfare to several hundred in the Nike Zeus Project Manager's Office. The required detailed procedures were more easily applied to some projects than to others. While each project manager varied his application of the techniques, nevertheless some

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- (1) Memorandum of Understanding Between the Ministry of Defense of the Government of Italy and the Department of Defense of the United States of America, Relating to the Co-ordinated Production of the M-113 Series Armored Personnel Carrier, 12 Feb 63. (2) Memorandum of Understanding Between OTO-Melara and Food Machinery Corporation as to the Essential Terms of Proposed Agreement for Furnishing Data, Know-how, and Technical Assistance for M-113 Type Vehicle Co-Production in Italy, 15 Jan 63. (3) Ltr, ASA(I&L) to CG, AMC, 15 Dec 62, sub: Manufacture in Italy of the M-113 Armored Personnel Carrier. (4) Memo, Roswell Gilpatric, Deputy SECDEF, for SA, 12 Dec 62, sub: Plan for Procurement and Manufacture of the M-113 Personnel Carrier by the Italian Government. (5) DF, CS, AMC, to Directorates, Staff Offices et al., 14 Dec 62, sub: Proj Manager, M-113 Italy Co-Production Program. (6) Lt Col Francis E. Abrino, "Co-Production for Security", Ordnance, (May-June 1964), pp. 646-648.

managers believed that the project management organization was too stereotyped, or too highly standardized.<sup>7</sup>

#### Activation, Termination, and Location

Of the original 30 project managers assigned in August 1962, 8 were located at Headquarters, AMC, while 22 were in the field. Colonels or lieutenant colonels headed 27 of the projects; 2 had brigadier generals as project managers. A total of 12 project managers reported directly to the Commanding General of the AMC. Four of these 12 were stationed in the field -- Deseret at Ft. Douglas, Utah; SATCOM at Ft. Monmouth, N. J.; Selected Ammunition at Dover, N. J.; and <sup>Jews</sup> Mike-X at Huntsville, Ala. All other project managers -- a total of 18 -- reported through one of the five commodity commands. Of these 18 project managers, 6 each reported to the Commanding Generals of the Electronics Command and of the Missile Command, respectively; 5 to the Commanding General, Weapons Command; and one each to the Commanding Generals of the Mobility and the Munitions Commands, respectively. The reporting arrangements for the Project Manager for the M60 Tank were unique in that though he was located

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<sup>7</sup>DF, Cmt 2, Lance Proj Manager, to Sp Asst for Proj Mgt, 18 Jan 63, sub: Defense Conf on Proj Mgt.

at Headquarters, Mobility Command, he reported through the Command-<sup>8</sup>  
ing General of the Weapons Command in Rock Island, Ill.

By 1 April 1964, the Command had terminated 5 project manager  
offices of the original 30, established 9 new ones to make a total  
of 34 project manager offices,<sup>9</sup> changed the name of 5 projects, and<sup>10</sup>  
relocated 2 project manager offices. Those established after the  
original 30 were the project offices for the Special Warfare Pro-  
ject, the NBC Chemical-Biological System, the Fire Support Aerial  
System (FAS), the AACOMS Communications System, the AR-15 (M16)  
Rifle, Generators, the Main Battle Tank (MBT), the Interim Air De-  
fense System (AIDS), and the Redeye. Those terminated were the pro-  
ject offices for the Field Army Ballistic Missile Defense System  
(FABMDS) on 6 November 1962, the AN/USD-5 Drone on 19 November 1962,  
the Davy Crockett Weapon System on 16 August 1963, and the BZ Chem-  
ical System and the M14 Rifle on 18 October 1963. For a short time  
after Project FAS was established in May 1963, it took the name of  
WESH, for Weapon Ship or Weapon System Platform. Project Missile B

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<sup>8</sup>  
(1) Ltr, AGAM-P (M) 310.1 ( 13 Sep 63) DCSLOG to CG, AMC,  
et al., 28 Sep 62, sub: Policy Guidance on Weapon/Equip Sys Mgt in  
the Army. (2) See Table 1.

<sup>9</sup>  
(1) Ltr, AGAM-P (M) 310.1 ( 13 Sep 63) DCSLOG to CG, AMC,  
et al., 28 Sep 62, sub: Policy Guidance on Weapon/Equip Sys Mgt in  
the Army. (2) AMC Proj Manager List, 25 Feb 64.

<sup>10</sup>  
See Table 1.

Table 1 - U. S. Army Materiel Command Project Managers' Offices  
1 August 1962 - 1 April 1964

Project	Location	Reporting To	Established
AACOMS			
(Communications System)	ECOM	CG, ECOM	1 Dec 62
Aircraft Weaponization	Hq, AMC	CG, AMC	1 Aug 62
AN/PRC-25 & AN/VRC-12 (FM Radios)	ECOM	CG, ECOM	1 Aug 62
AN/USD-5 (Drone)	ECOM	CG, ECOM	1 Aug 62
AR-15 Rifle (M16)	WECOM	CG, WECOM	29 Mar 63
BZ (Chemical System)	Army Chem Ctr, Md	CG, MUCOM	1 Aug 62
CCIS-70 (Command Control Information System-1970)	Ft. Huachuca, Ariz	CG, ECOM	1 Aug 62
CV-7A (Aircraft Formerly Caribou)	Hq, AMC	CG, AMC	1 Aug 62
Chinook (Helicopter)	Hq, AMC	CG, AMC	1 Aug 62
Combat Vehicles	WECOM	CG, WECOM	1 Aug 62
Davy Crockett Weapon System	WECOM	CG, WECOM	1 Aug 62
Deseret (Test Center)	Ft. Douglas, Utah	CG, AMC	1 Aug 62
FABMDS (Field Army Ballistic Missile Defense System)	Hq, AMC	CG, AMC	1 Aug 62
FAS (Fire Support Aerial System)	Hq, AMC	CG, AMC	20 May 63
General Purpose Vehicles	MOCOM	CG, MOCOM	1 Aug 62
Generators	MOCOM	CG, MOCOM	26 Mar 63
Hawk (Guided Missile)	MICOM	CG, MICOM	1 Aug 62
Hercules (Guided Missile)	MICOM	CG, MICOM	1 Aug 62
IADS (Interim Air Defense System)	Hq, AMC	CG, AMC	5 Dec 63
Iroquois (Helicopter)	Hq, AMC	CG, AMC	1 Aug 62
Lance (Missile)	MICOM	CG, MICOM	1 Aug 62
LOH (Light Observation Helicopter)	Hq, AMC	CG, AMC	1 Aug 62
M-14 Rifle	WECOM	CG, WECOM	1 Aug 62
M-60 Tank	MOCOM	CG, MOCOM	1 Aug 62
MQM-58A (Airborne Surveil- lance System)	ECOM	CG, ECOM	1 Aug 62
Main Battle Tank	Hq, AMC	CG, AMC	15 Aug 63
Mauler (Guided Missile)	MICOM	CG, MICOM	1 Aug 62
Mohawk (Aircraft)	Hq, AMC	CG, AMC	1 Aug 62
NBC (Automatic Chemical- Biological Warning System)	Hq, AMC	CG, AMC	20 Nov 62
Nike X (Anti-missile Missile)	MICOM	CG, AMC	1 Aug 62
Pershing (Guided Missile)	MICOM	CG, MICOM	1 Aug 62
RADAS (Random Access Discrete Address System)	ECOM	CG, ECOM	1 Aug 62
Redeye (Missile)	MICOM	CG, MICOM	1 Apr 64
SATCOM (Satellite Communica- tions System)	SATCOM AGENCY Ft. Monmouth, N. J.	CG, AMC	1 Aug 62
Selected Ammunition	MUCOM	CG, AMC	1 Aug 62
Sergeant (Ballistic Missile)	MICOM	CG, MICOM	1 Aug 62
Sheridan/Shillelagh (Armored Recon/Airborne Assult Vehicle)	Hq, AMC	CG, AMC	1 Aug 62
Special Warfare	Hq, AMC	CG, AMC	7 Nov 62
UNICOM-STARCOM (Communica- tions System)	ECOM	CG, ECOM	1 Aug 62

became Project Lance, ADVENT became the Satellite Communications System (SATCOM), the AN/USD-2 project was renamed the MQM-58A Airborne Surveillance System, with the popular name of Overseer, and the Caribou project became the CV-7A Aircraft project to distinguish it from the operational Caribou which was no longer under project management. <sup>11</sup> Effective 1 June 1964, the AMC reassigned the Office of the Project Manager for Selected Ammunition from Headquarters, AMC, <sup>12</sup> to the Munitions Command.

The AMC generally located a project manager at the Command that had the predominant interest in his project. However, when more than one command was involved, when the funds were large, operational difficulties were foreseen, or urgency dictated, the project manager usually reported directly to Headquarters, AMC. <sup>13</sup> Only two project manager offices had been moved from their original locations by the end of 1963. Effective 15 April 1963, the Command moved the Sheridan/Shillelagh office from Headquarters, AMC, to the Army Weapons Command at Rock Island, Ill. This weapon system involved a

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<sup>11</sup>

(1) Ibid. (2) Slide provided by Col John M. Christensen, Jr., Sp Asst for Proj Mgt, to CG, AMC, 16 Mar 63. (3) DF, PMSO, MQM-58A, to All Divisions and Staff Offices, Hq, AMC, 7 May 64, sub: The MQM-58A Airborne Surveillance System. (4) Information furnished by personnel in the AMC Office of the Special Assistant for Project Management or taken from the files of that Office.

<sup>12</sup>

AMC GO 32, 8 May 64.

<sup>13</sup>

Memo, Col John M. Christensen, SGS, AMC, for CG, AMC, 26 Jul 62, sub: Proj Mgt Location and Assignment.

self-propelled vehicle for which the Weapons Command could provide the best technical support.<sup>14</sup> On 1 July 1963, the AMC relocated the Project Manager's office for the Command Control Information System-1970 (CCIS-70) from Ft. Huachuca, Ariz., to Ft. Belvoir, Va., in order to facilitate cooperation with the Combat Development Command and Headquarters, AMC.<sup>15</sup>

### Project Management in Operation

#### Overall Direction and Control

The AMC interim procedures of June 1962 and January 1963 consolidated the directives and policies of the AMC on project management and set forth the format by which the Commanding General expected to be informed on the overall plans and status of each weapon system.<sup>16</sup> These procedures provided a reporting plan, a system for projecting total financial resource requirements, and a time and

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<sup>14</sup> (1) AMC GO 20, 1 Apr 63, sub: USAMC Office of the Proj Managers. (2) Ltr, Col Wayne G. Higgins, Proj Manager, Sheridan/Shillelagh to Hqs, AMC, & all AMC Fld Instls, 12 Apr 63, sub: Relocation of the Office of the Sheridan/Shillelagh Proj Manager.

<sup>15</sup> (1) AMC GO 40, 23 Jul 63. (2) CCIS-70 Annual Summary, FY 63, p. 5.

<sup>16</sup> For the drafting of these procedures, see above, pp. 120-126.

cost trend analysis. They also introduced a network plan consisting of from 40 to 60 milestones. These procedures provided a common basis for the review of all designated systems as well as for rendering accountability to the Department of the Army.<sup>17</sup>

Project management is a dynamic process that calls for continuous review and revision of policies and procedures. The June 1962 directive represented the initial step toward a goal of a total decision-making process. The second step in January 1963, still an interim one, carried the basic philosophy further toward that goal, involving program evaluation review technique (PERT) time, cost, and technical performance. This interim procedure was not all-inclusive, and it did not incorporate all of the detailed steps necessary for control and management at the project management level. While the Command based these procedures on the concept that project management was a specialized process within the AMC, the process had to be compatible with the reporting requirements of the Department of the Army and the Department of Defense. Although the January directive added other features of the Pert/Cost network, including a work breakdown structure for a weapon

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<sup>17</sup>(1) AMC Planning Directive 24, 12 Jun 62, sub: AMC Concept of Proj Mgt. (2) Ibid., No. 32, 27 Jun 62, sub: Interim Proj Mgt Procedures. (3) AMCR 11-7, Jan 1963, sub: Interim Proj Mgt Procedure. (4) AMCR 11-7, C1, 22 Mar 63.

system, the Command still faced the task of designing the final  
control system for project management.<sup>18</sup>

The AMC published its three-volume guide for the final control system late in 1963. This control system was based upon the direct relationship of time, cost, technical performance and the need to review the status of a weapon system in relation to the total project. The guide established the basic policies, concepts, objectives, philosophy, and requirements of project management within the Command. It identified the type of data desired, the manner in which it was to be progressively summarized, and the manner in which it would be used by the top Army management. It further identified the methods by which such data was to be collected and emphasized the reliability of that information. Moreover, it provided guidance to the project manager on ways and means of adapting this management system to his unique situation. The output of this management system, including the Project Management Master Plan (PM<sub>2</sub>P) and other mandatory progress reports, provided a means of reviewing all projects on a common basis.<sup>19</sup>

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(1) Intvw, Author with Donald J. Porter, AMETA, 10 Apr 63.  
(2) AMC Planning Directive 24, 12 Jun 62, sub: AMC Concept of Proj Mgt. (3) Ibid. No. 32, 27 Jun 62, sub: Interim Proj Mgt Procedures. (4) AMCR 11-7, Jan 1963, sub: Interim Proj Mgt Procedures.

<sup>19</sup>

AMCR 11-16, Vol I, Aug 1963, sub: Planning and Control Guide for Executives; Vol II, Aug 1963, sub: Planning and Control Procedures for Proj Mgt, Vol III, Nov 1963, sub: Master Plans and Reports (PM<sub>2</sub>P) for Proj Mgt.

The earlier interim project management procedures had been concerned primarily with the relation of the project managers to the Commanding General, AMC, and had not included management techniques and procedures for use at the level of the project manager himself. The new three-volume guide provided the project managers with the techniques and procedures for effective management and for meeting reporting requirements of higher authority. These techniques were not necessarily new but, when applied to the basic concept of project management, resulted in reliable data for making the required decisions at all levels of management. Although the Commanding General delegated full line authority to the project manager, it was essential that all projects be reviewed on a common basis. The PM<sub>2</sub>P was designed as a basis for such a review. It had sufficient latitude to accommodate any unique project and to provide for different phases in the life cycle of a weapon. Upon the effectiveness of his planning and the reliability of his predictions, the Command assessed the project manager's performance and the progress of his project.<sup>20</sup>

Although basic master planning and reporting were required, not all of the published techniques and procedures were mandatory. However, the project manager was encouraged to apply those that were

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<sup>20</sup> Ibid., Vol III, Nov 1963, sub: Master Plans and Reports (PM<sub>2</sub>P) for Proj Mgt.

not mandatory whenever appropriate.<sup>21</sup> Moreover, the Command encouraged its commodity commanders to utilize these techniques of management for other items whenever such use would provide more effective control.<sup>22</sup>

In applying the new management guide, the project manager developed his own project plans. The Command was aware that a project manager might find certain techniques described in the regulations not adaptable to his project. In developing phases of their respective projects for the application of these management techniques, the project managers had the assistance of the Data Systems Office at Headquarters, AMC.<sup>23</sup>

For the project manager, proper staffing was highly important and could pose difficult problems. However, the AMC regulations were definite concerning the provisions of personnel spaces. For all project managers in the field, the instructions provided that the required manpower spaces were to be charged against the manpower authorization of the local command. In these cases, the Project

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<sup>21</sup> Ibid., Vol II, Aug 1963, sub: Planning and Control Procedures for Proj Mgt.

<sup>22</sup> Ibid., Vol I, Aug 1963, sub: Planning and Control Guide for Executives.

<sup>23</sup> Memo, CS, Hqs, AMC, to All Proj Managers, 6 Dec 63, sub: Proj Mgt Total Decision-Making Proj, AMCR 11-16.

Manager Staff Officer was to be located at the AMC Headquarters, which was to provide stenographic and clerical assistance.<sup>24</sup>

During the first year of operation, the Department of the Army and the AMC published a number of letters which delineated the overall responsibilities and authority of the project managers. For example, in September 1962, a DCSLOG letter stated that the project manager, the personal representative of the Commanding General, AMC, was responsible for coordination, direction, and control of all work and associated resources in all phases of research and development, procurement and production, distribution, and logistic support involved in providing a weapon system to combat units.<sup>25</sup> In January 1963, the AMC, CDC, and CONARC signed a Memorandum of Understanding which further delineated the responsibilities for effecting the initial transfer of knowledge on operational readiness, deployment, and training after deployment of a new weapon. In effect, this Memorandum gave the project manager full responsibility for insuring the maximum interchange of knowledge.<sup>26</sup> Its specific objective was to achieve a high degree of coordination between the three Commands.

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<sup>24</sup> Joint Messageform, CG, AMC to CG, Weapons Command, 27 Jul 62.

<sup>25</sup> Ltr, AGAM-P(M) 310.1 (13 Sep 62) DCSLOG to CG, AMC, et al., 28 Sep 62, sub: Policy Guidance on Weapon/Equip Sys Mgt in the Army.

<sup>26</sup> Memo of Understanding, Joint Policy of CG, AMC, CDC, and CONARC, 25 Jan 63, sub: New Equip Training and Support.

In order to emphasize the authority of the project manager, the Commanding General of the AMC issued a letter, in March 1963, to all elements of the Command stating in effect that each project manager had full authority to make decisions regarding his particular weapon system. In addition, he stipulated that each project manager would give the overall direction and control necessary to implement his plans, that he would not be responsible to any functional directorate, and that he would deal directly with the OSD, the DA staff, the CDC, the CONARC, the field units of the Army, and other military services. For those projects managed at a major subordinate command, he stated that the project manager would be responsible to the Commanding General, AMC, through the commander of the subordinate command. Within Headquarters, AMC, the Comptroller and Director of Programs and other directors were to provide guidance regarding the allocation of resources between projects and commodities. He further reiterated that the Special Assistant for Project Management would effect coordination among the project managers for matters of policy and administration.<sup>27</sup>

While the Commanding General, AMC, was convinced that the project management system would be of great and lasting benefit, he believed

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Ltr, CG, AMC, to AMC Directors and Staff Officers and All Subordinate Commands, 4 Mar 63, sub: Operating Policies and Organizational Relationships for the Conduct of Proj Managers.

that there would undoubtedly be areas where refinement would be needed during the pioneering period. He invited frank opinions and recommendations whenever the system needed strengthening or clarification. Every new project manager was to be personally considered and approved by him. It was his intention to obtain the highest caliber and most fully qualified officers that the Army could provide.

As applied in the AMC, project management meant vesting in a single individual the sole authority for accomplishing the objectives of a program. It meant that the manager's attention was focused exclusively on these objectives, and, in consequence, his efforts were not divided. Several basic factors differentiated the approach of a project manager to his program from that of a project coordinator. Project coordinators operating in the former technical services had no authority over the functional elements that worked on the project, nor did they have funds or other resources which they could bring to bear on the project. On the other hand, the project manager had a technical staff assigned to his office to follow the main technical problems of the weapon and to propose solutions to those problems. He also had a management

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Ibid.

staff immediately responsive to the needs of the project in such areas as programing and budgeting. While the project manager's staff thus followed the main technical, administrative, and financial problems, functional organizational elements had some part in the process. Moreover, the project manager could "buy" support and assistance from in-house laboratories, installations, and outside contractors. Unlike the coordinator, the project manager controlled all dollar resources allotted to his project. Nor could funds once apportioned to his project be diverted and used for other purposes. Finally, the project managers were effectively "wired in" to the top. They were appointed by a special letter of instruction. With respect to their projects, they spoke for the Commanding General, AMC.<sup>29</sup> In his name, they could deal directly with all elements of AMC, CDC, CONARC, DA, and others to insure progress in their weapon system.

#### Red-Line Reporting

Project managers had still another advantage not enjoyed by the former project coordinators, namely, communication by means of the Red-Line channel. This meant that a project manager located at

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(1) Remarks, Lt Gen Frank S. Besson, Jr., CG, AMC, at General Officer's Course, U. S. Army Management School, Ft. Belvoir, Va., 26 Apr 63, sub: Decision by Design. (2) Speech, General Besson before National Advanced Technology Conference, Seattle, Wash., 5 Sep 62.

a major subordinate command could communicate directly with the Commanding General, AMC, without going through the commanding general of the major subordinate command. General Besson, in turn, could at any time communicate directly with a project manager in the field without going through normal channels.

General Besson was aware that some Army personnel were skeptical concerning the use of the Red-Line channel. Traditionally, an officer did not by-pass his commander by communicating with the next higher echelon of authority. General Besson therefore indicated that when a project manager used this avenue for emergency purposes, he was to advise and coordinate with his commander either before or immediately afterwards.

Although project managers could use the Red-Line to call to General Besson's attention special problems or conflicting priorities that could slow down a particular program, he nonetheless expected the project managers to use the Red-Line sparingly. He referred to it as a hierarchical structure that must be used judiciously by any reasonable man. Nevertheless, he believed that this special channel would be a partial cure for serious problems that were apt to face the top command. General Besson anticipated

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Intvw, Author with Col Paul A. Feyereisen, DCS, AMC,  
27 Feb 63.

that he would have many problems in the AMC, but he expected to be kept informed so that he would not "have too many surprises".<sup>31</sup>

Any Red-Line reporting was of an emergency nature and was in addition to the normal reports, such as the PM<sub>2</sub>P, and the weekly, monthly, and quarterly progress reports. In brief, the Red-Line report was a telephone report from the project manager to the Commanding General, AMC, for the purpose of obtaining his immediate personal assistance in a crisis concerning a weapon system on which the project manager had taken all possible action without complete success.<sup>32</sup>

#### Project Management Funds

Early in the planning stage of the AMC, the Command had recognized the need for possessing the capability of analyzing long-term resource requirements. In particular, the availability of financial data on important weapon systems was essential. Project managers, having been given the responsibility to manage designated weapons, had to determine the resource requirements in depth as a basis for subsequent major decisions on the weapon systems. These resource

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<sup>31</sup>

Speech, Lt Gen Frank S. Besson, Jr., CG, AMC, before National Advanced Technology Conference, Seattle, Wash., 5 Sep 62.

<sup>32</sup>

AMCR 11-7, Jan 1963, sub: Interim Proj Mgt Procedure.

requirements were subject to review and analysis by the AMC Program Directors. With continuing emphasis on financial projections throughout the Department of Defense, the long-term financial appraisal by the project manager played an important role in decision-making and in materiel management generally. <sup>33</sup>

After the AMC issued the annual funding program, it was necessary to distribute the funds to the major subordinate commands and to single out that portion relating to each project manager. While the subordinate commands obtained a portion of all funds, the project managers were allocated only RDT&E and PEMA funds. The project manager made arrangements with the appropriate commander for administrative and logistic support financed by O&MA funds. He initiated the annual program and budget requests, the reprogramming actions, and any changes to the basic plan that were necessary to satisfy requirements set by the Department of the Army for his item of materiel. The Comptroller and Director of Programs and the AMC Program Directors provided guidance on the overall allocation of resources. <sup>34</sup>

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Harry A. Jacobs, "Installment Budgeting: Reasons Why Army is Starting to Pay Now for Tomorrows' Forces". Armed Forces Management, (Sep 1963), pp. 50-53.

34

Ltr, CG, AMC, to AMC Directorates and Staff Offices and all Subordinate Commands, 4 Mar 63, sub: Operating Policies and Organizational Relationships for the Conduct of Proj Mgt.

In order to establish a control for project management funds, the Command assigned a series of allotment serial numbers to each project manager. It also installed a reporting system by which each manager reflected his funds, obligations, and disbursements. Since funds were not issued directly to project managers, they had no responsibility for administrative control of such funds. They were responsible, however, for developing fund requirements and for directing the placement of funds. In the field, the local installations provided financial services for the project managers. At all echelons of the Command, the accounting records reflected the financial condition and status of the funds of each project manager.<sup>35</sup>

The expenses of operating a project manager's office were charged to RDT&E, PEMA, or O&MA funds as equitable and applicable. When a project manager was identified primarily with RDT&E projects, the cost of labor and materials used by him were chargeable against the related research and development project.<sup>36</sup>

In the development programs, the project manager had authority to deal directly across-the-board on his project. However, the

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(1) Ltr, CG, AMC, to CG's all Subordinate Commands, 28 Jun 62, sub: Proj Manager Funds. (2) Historical Summary, Finance and Accounting Division, Hqs, AMC, FY 63, p.19.

36

AMCR 37-5, 28 Feb 64, sub: Financial Administration--Financing Proj Manager Offices.

AMC Director of Research and Development participated in the review and justification of all budget actions involving RDT&E funds used on project-managed weapon systems. In his procurement functions, the project manager was expected to utilize the procurement offices and the procurement elements in the major subordinate commands to the maximum extent consistent with effective management.

#### Special Assistant for Project Management

In August 1962, after much deliberation, the Command established the Office of Special Assistant for Project Management. Because this Office had not been planned earlier, the coordinating task had been carried on by the Secretary of the General Staff, Col. John M. Christensen, Jr. However, the increasing workload attributable to the project managers called for continuous coordination and consumed a major portion of the Secretary's time. The Commanding General, AMC then decided that Colonel Christensen would be made the coordinator for project managers. While the secretary's position did not preclude his being coordinator for project managers, this would have added another echelon to the coordi-

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AMC Directive 3, 4 Sep 62, sub: Organization and Functions: Concept for AMC Operation - Development and Engineering.

38

AMC Directive 715-18, 11 Oct 62, sub: Procurement -- Appointment of Proj Managers as Contracting Officers.

nating channel -- from project manager, through the Secretary of the General Staff, through the Chief of Staff to the Commanding General. So the decision was made to establish the position of Special Assistant for Project Management, who reported directly to General Besson and could contact directly the higher staff levels in the Department of the Army. The Special Assistant facilitated the flow of information between the command element and the project managers, coordinated administration for them, established project management policy, and generally acted as the staff specialist in this field.

The Special Assistant served as a point of contact for project managers and project manager staff officers on administrative and personnel matters and facilitated support within the AMC Headquarters. He coordinated their inquiries and reports on the status of the individual projects. Such coordination was necessary, especially when more than one staff directorate and several project managers were involved.

#### DASSO's

In addition to the coordination at the Headquarters, AMC level, there was a need for coordination at the DA and DOD levels.

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(1) Intvw, Author with Col Paul A. Feyereisen, DCS, AMC, 27 Feb 63. (2) Memo, Sp Asst for Proj Mgt for CS, AMC, 24 Jul 62, sub: Proj Manager Coordination. (3) Intvw, Author with Col John M. Christensen, Jr., Sp Asst for Proj Mgt, 26 Feb 63.

Therefore, in the fall of 1962, the Chief of Staff, U. S. Army, established the position of Department of the Army Systems Staff Officer (DASSO) to serve as a focal point for collecting and coordinating information on each project-managed weapon or item. Under their policy directive, the DASSO's required reports on milestones developed at the DA staff level in addition to those already established by the AMC. According to the DA staff, a milestone was "a significant, measurable, definitive act in the time frame of any item from its concept phase through to actual operations in the field". With firm policy direction, the DASSO's could impose their own milestones on the AMC and upset the AMC milestone reporting system. AMC project management personnel believed that the DASSO's required too much information, that this would generate a large volume of work for the project managers, and that, in effect, the DASSO's might try to direct project managers from the DA level.

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Memo, CS for DCS, COA, et al., 11 Sep 62, sub: Establishment of DASSO's.

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TAG ltr, AGAM-P(M) 322.011 (12 Sep 62)CS, CS to CG, AMC, et al., 12 Sep 62, sub: Establishment of DASSO's.

<sup>42</sup>

Intvw, Author, with Paul Davis, AMC Data Systems Office, 3 Mar 64.

<sup>43</sup>

(1) Intvw, Author with Herbert Edlis, Data Systems Office, 28 Feb 64. (2) Ltr, CG, AMC, to CS, USA, 1 Oct 62, sub: Submission of DOD Milestones and DOD Progress Reports.

According to the policy directive, the DASSO was to be thoroughly knowledgeable on the overall status of the weapon system project assigned to him. In conjunction with appropriate Army staff agencies and major commands, he was to develop, coordinate, and maintain the milestone schedule for the assigned items. His schedule was to be submitted to the Director of Army Programs in the Office, Chief of Staff. He was to insure a continuous exchange of information on all current and proposed actions related to the assigned weapon systems and to answer DOD inquiries. All DA staff agencies and major commands were to respond to the requirements placed upon them by the DASSO's.

The Director of Army Programs felt that the AMC project manager was not in a position to coordinate the overall project beyond the Command. Therefore, he believed that this coordination should be done at DA staff and defense levels. A major tenet of the plan was the OSD requirement for the submission by the Department of the Army of monthly progress reports on selected project-managed items. To aid in compiling this information, the Secretary of the General Staff, early in October 1962, prepared a list of DASSO points of contact in the AMC, including a complete list of projects

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<sup>44</sup>  
TAG ltr, AGAM-P(M) 322.011 (12 Sep 62)CS, CS to CG, AMC, et al., 12 Sep 62, sub: Establishment of DASSO's.

and project managers or Project Manager Staff Officers, with  
telephone numbers and a suggested approach for the DASSO's.<sup>45</sup>

The Director of Army Programs stressed the importance of complete reports consistent with DOD milestone schedules. He stated that representatives of the CDC and the CONARC had indicated a strong interest in the DASSO's and their reports.<sup>46</sup>

In commenting on the establishment of the DASSO's, General Besson stated that his project managers in the AMC accomplished excellent coordination through command liaison and that there was close and continuing interdependence between CDC, the CONARC and the AMC. He insisted that the operating command level provided for detailed review of project manager plans and operations, and that "this management approach minimizes time consuming reprogramming actions involving higher authorities".<sup>47</sup> The AMC anticipated that no further action in this area would be taken.

Nevertheless, the Department of the Army persisted in the requirement for milestone reporting on selected items and weapons.

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<sup>45</sup>  
Memo, SGS, DA, for DCSLOG, DCSOPS, CRD, 8 Oct 63, sub: Major Commands Points of Contact for DASSO's.

<sup>46</sup>  
Memo, Chief, Policy Div, DCSLOG, for Chief, Air Defense Div, Zeus Office, et al., 24 Oct 62, sub: Submission of DOD Milestone Schedules and Related Monthly Progress Reports.

<sup>47</sup>  
Ltr, CG, AMC, to CS, USA, 1 Oct 62, sub: Submission of DOD Milestone Schedules and DOD Monthly Progress Reports.

In the fall of the following year, the Secretary of the General Staff reminded the Chief of Research and Development and other DA staff officers of the continuing requirement for milestone reporting as cited in earlier DOD and DA directives.<sup>48</sup> His communication left no doubt of the DA milestone reporting requirement and of the DASSO's mission to coordinate, develop, and maintain milestone schedules in conjunction with the Department of the Army staff agencies and major commands. The new directive reiterated that the DASSO's were to be the focal points for the items or systems assigned to them. It gave detailed instructions on how the DASSO's were to operate. DA staff agencies appointed DASSO's and alternates for each weapon system as directed by the Chief of Staff.<sup>49</sup>

Immediately following the October restatement of DA policy, the AMC alerted its field commands and project managers to the new action in re-establishing milestone reporting procedures for the DASSO's.<sup>50</sup> To clarify the requirement, the Chief of Staff issued a

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(1) DOD Directive 7045.1, 12 Apr 61, sub: Program Change Control System. (2) DOD Instruction 7045.2, 17 Apr 61. (3) Memo, CS for DCS, COA, et al., 11 Sep 62 sub: Establishment of DASSO's. (4) Memo, SGS for COA et al., 17 Oct 63, sub: DASSO's - Milestone Schedules.

<sup>49</sup>  
Intvw, Author with D. J. Shearin, Proj Mgt Br, R&A Div, C/DP, AMC, 2 Mar 64.

<sup>50</sup>  
Ltr, CG, AMC, to AMC Field Commands and Project Managers, 6 Nov 63, sub: Submission of DA/DOD Milestone Schedules and Monthly Progress Reports.

new directive, on 29 January 1964, which reinstated master milestone schedule reporting and requested the AMC to recommend milestones to be added to each schedule and changes to dates in the schedules, to furnish initial schedule dates for milestones that had not yet been provided, and to submit the name and telephone number of the AMC current milestone system point of contact. Further detailed instructions on the preparation of the monthly reports were to be provided by the Department of the Army. When approved by the Chief of Staff, these schedules were to be the basis for the preparation of the required monthly reports. <sup>51</sup> In February 1964 the AMC imple-  
<sup>52</sup> mented the Chief of Staff's directive.

Again in March 1964, the AMC called the attention of the Department of the Army to the Command's philosophy on milestone identification and reporting, and reiterated the viewpoint that this system served not only its own project managers but provided a basis for summarizing milestones for DA and DOD management levels. In analyzing the DA requirements, the Command reasoned that the extent of milestone reporting to the Department of the Army appeared

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<sup>51</sup>

(1) TAG ltr, AGAM-P(M) (28 Jan 64)CS, to CG, AMC, et al., 29 Jan 64, sub: DA Milestone Schedules. (2) See, The Army Program Manual, 17 Jun 63, pp. 9-2 for the reporting responsibilities of the DASSO's.

<sup>52</sup>

Ltr, CG, AMC, to Fld Commands and Proj Managers, 13 Feb 64, sub: DA Milestone Schedules.

to have been left to the judgment of the individual DASSO and that the variance in the number of milestones for different items seemed to be excessive. Furthermore, the AMC believed that if the DA and DOD milestone reporting requirements were limited to the planning, programing, and policy functions of their levels of responsibility, the reporting requirements could be reduced considerably. The Command recommended that the master schedule be revised to reflect only the major milestones common to all weapon systems plus a minimum number of additional ones peculiar to a particular item.

The AMC felt that the DASSO's could not, as constituted, make a significant, constructive contribution and that they would tend to interfere with the operation of the AMC project management system. As constituted, the DASSO's were not high level coordinators, but served only as contact men. On the other hand, the AMC project managers were high ranking officers who were especially trained for the particular project to which each was assigned, and they effected excellent coordination with the CDC and the CONARC.

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<sup>53</sup>  
(1) Ltr, Maj Gen Wm. B. Bunker, C/DP, to TAG, 20 Mar 64, sub: DA Milestone Schedules. (2) MFR, Herbert C. Melvin, Review and Analysis Div, C/DP, 20 Mar 64, sub: Master Schedules.

<sup>54</sup>  
Intvw, Author with Col John M. Christensen, Jr., Asst to the CG, AMC, 4 Feb 64.

Meanwhile, the DASSO's worked on the milestone reports submitted by the AMC in response to the Chief of Staff's directive of January 1964.<sup>55</sup> Using these reports as a basis, the Chief of Staff issued a revised directive in May which set forth the reporting requirements for the AMC project managers. Briefly, the Chief of Staff required monthly reports on milestone schedules prepared by his staff with the assistance of the AMC.<sup>56</sup>

### Specific Applications

Because of the wide variety of projects involved, the application of the project manager concept within the AMC varied considerably. For example, the support and maintenance of a weapon in combat presented different problems than those faced generally in the research and development phases. Likewise, the problems faced in the application of this management technique to the cooperative development of a main battle tank, to the development and acquisition of high-priority items for use in special warfare, or to the testing of a chemical-biological system varied widely from those encountered in the management of a typical weapon system project. The AMC application of the project manager

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TAG ltr, AGAM-P(M) (28 Jan 64)CS, to CG, AMC, et al., 29 Jan 64, sub: DA Milestone Schedules.

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(1) Intvw, Author, with D. J. Shearin, Proj Mgt Br, R & A Div, C/DP, AMC, 17 Apr 64. (2) TAG ltr, AGAM-P(M) (1 May 64), to CG, AMC, et al., 4 May 64, sub: DA Milestone Schedules-Progress Reports.

concept was the widest in the Department of Defense. It encompassed such items as rotary and fixed-wing aircraft, guided missiles, tanks, transport vehicles, generators, special ammunition, and communications systems. This difference in items entailed a variety of techniques and procedures in the application of the project manager concept.

### Iroquois

The application of the project management concept to the Iroquois helicopter extended across-the-board from development to operational use in the field. Unlike most project managers, the Iroquois manager kept in close touch with the combat commands in order to give immediate response to support problems. Under a charter dated 20 July 1962, the AMC established the project manager's office for the UH-1 Iroquois helicopter at Headquarters, AMC, effective 1 August 1962.<sup>57</sup> The Iroquois was the Army's turbine-powered helicopter for use in providing tactical mobility for troops and cargo in combat areas. At that time, the Iroquois was the largest aviation program within the Department of the Army budget, with a dollar value of \$148 million. Furthermore, this helicopter was in operational use in South Vietnam.

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<sup>57</sup>

TWX, CG, AMC, to Iroquois Project Manager, 20 Jul 62.

Because of the risks involved in a campaign geared to airlift, it was imperative that any defects that developed in an aircraft being used in combat be repaired immediately, and that all similar aircraft be inspected for such defects in order to maintain the combat effectiveness of the forces. The Iroquois Project Manager maintained close liaison with the combat commands in the operational area. This enabled him to give immediate response to Iroquois support problems in the combat zone. Without any staffing delays, he dealt directly with the contractor to assure that the remedy to any repair or maintenance problem was applied quickly and correctly.<sup>58</sup> Thus the Iroquois Project, in relation to the total Army aviation program, very aptly met the requirements which General Besson had applied as a basis for the selection of a project for this type of management.<sup>59</sup>

Such factors as the requirements of the Iroquois procurement cycle and the need to meet deadlines in sustained production set the stage for unprecedented action by the project manager. Through his efforts, deficiencies were corrected, the Iroquois was standardized, and production began in an appreciably shorter time than

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<sup>58</sup>  
Intvw, Author with Henry M. Pierce, Iroquois Project Manager's Office, 20 Apr 64.

<sup>59</sup>  
Speech, Lt Gen Frank S. Besson, Jr., before National Advanced Technology Management Conference, Seattle, Wash., 5 Sep 62.

would have been possible under the functional alignment. Furthermore, the project manager took corrective action with the first evidence of a shortage of spare helicopter parts for a version of the Iroquois in use in Europe. Thus, the Iroquois project manager applied and tested the responsiveness of the project manager system, which General Besson had repeatedly emphasized.

### Chinook

The Chinook Project Manager demonstrated that lead time could be appreciably reduced by the vigorous application of the project management concept and by producing on a concurrent development-production basis. Under the directives which stated the criteria for selection of items to be project managed, the AMC activated the Project Manager's Office for the CH-74A Chinook helicopter on 1 August 1962. The Chinook was the Army's turbine-powered, tandem rotor, medium transport helicopter with the capacity to carry 33 combat-equipped troops. Based on the authority given him by a series of directives, the Chinook project manager took aggressive action to recruit a qualified staff, prepare a table of distribution, and establish a system of tight controls for the Chinook project.

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- (1) Iroquois Project Manager, Annual Summary, FY 63, pp. 7-13.  
(2) Address, Col Michael J. Krisman, Iroquois Project Manager, to Proj Mgt Class, Fort Lee, Va., 9 Mar 64.

61

Chinook Project Manager, Annual Summary FY 63, pp. I-3, II-2.

An Army regulation of 1961 established a 4-year time frame from the initiation of the Chinook project to the completion of the first production model. By producing the Chinook on a concurrent development-production basis, this helicopter became operational at least 2 years earlier than it would have if the normal research, development, and production cycle had been followed. Within a year after the activation of the project manager's office, the Chinook program, under close supervision by the project manager, was well underway.<sup>62</sup> The AMC delivered Chinook aircraft on schedule, the CONARC proceeded in training the crews, the maintenance and support programs progressed satisfactorily, and the AMC, CDC, and CONARC closely coordinated all activities related to the entire Chinook program.<sup>63</sup>

### Caribou

The Caribou was an example of a project, a part of which was deprojectized while the remainder continued under project management. The AMC established special managership for the Caribou, a high-wing, tactical transport airplane, to assure that this aircraft would be available in time, and in sufficient quantity, to meet the Army's need for increased battlefield mobility. This aircraft was designed to operate from small unimproved areas for close

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62

Ibid., p I-4

63

Ibid., p. II-4

support of Army troops in the battle zone.

The Caribou Project Manager's Office became operational on 1 August 1962. This project consisted of 2 tactical aircraft, the CV-2B, which had been in production since 1960, and the CV-7A, which was under development. Since the CV-2B had been assigned to troop units, and the training and support base had been established and was functioning, General Besson decided, in mid-July 1963, that this version of the Caribou should be deprojectized. It had reached the stage where he felt that it no longer met the criteria for being project managed.<sup>64</sup>

The newer version, the CV-7A, remained under project management after the CV-2B was deprojectized. However, early in 1964, the AMC reduced this project manager's office from eleven to a personnel strength of three, which was sufficient to provide direction and control for the remaining limited program.<sup>65</sup> This reduction in personnel did not mean that the CV-7A was deprojectized but that the project manager would rely to a greater degree

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<sup>64</sup>

(1) Memo, CG, AMC, for Col Karl H. Zornig, Caribou Proj Manager, 17 Jul 63, sub: Reorganization of Caribou Proj Mgt Office. (2) DF, SA for Proj Mgt Hqs, to AMC Divisions and Staff Offices, 17 Jul 63, sub: Deprojectization of the Tactical Transport Airplane, CV-2B(Caribou).

<sup>65</sup>

(1) AMC GO 14, 26 Feb 64. (2) Joint Message Form, CG, AMC, to CG, MOCOM, sub: Reorganization of CV-7A Proj Mgt.

upon the functional staffs. In turn, they looked to him for  
necessary decisions, policy, and guidance. Evidence of the  
continuing interest in the project-managed CV-7A portion of the  
Caribou program is found in the views expressed by the Secretary  
of Defense to the Senate Committee on Appropriations on the mili-  
tary value of this aircraft and the Committee's approval of his  
support of the project.

#### CCIS-70

This project manager's office was one of the two such offices  
that were relocated during the first year of operation. It also  
provides an example of how an increase in grade structure for  
civilian personnel can remedy a weakness in the staffing of an  
office. Placing of the Command Control Information System-1970  
under project management culminated a series of events that revealed  
the increasing interest in automated data processing for the Army in  
the field. The tactical objective of this system was to give field  
commanders information needed quickly. The computer equipment was  
to be completely mobile and designed to satisfy the quick reaction

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Minutes of meeting, Discussion of the Operating Relationship  
Between the Functional Staff and the CV-7A Proj Manager, at Hq,  
AMC, 30 Mar 64.

67

- (1) Ltr, Robert S. McNamara to Hon Richard B. Russell, Chair-  
man, DOD Subcommittee, Senate Committee on Appropriations, 13 Jan 64.
- (2) Ltr, Hon Richard B. Russell to Robert S. McNamara, 15 Jan 64.

time required by the Army by 1970 and beyond.

When the Project Manager's Office for the CCIS-70 was activated on 1 August 1962, it was located at Fort Huachuca, Ariz. In September, the project manager obtained a skeleton staff. Although the table of distribution was approved in January 1963, the Defense Directorate of Research and Engineering, in March, suggested potential weaknesses in the staffing of the Project Manager's Office. Subsequently, the combined efforts of the AMC, the Department of the Army and the Defense Directorate of Research and Engineering resulted in an appraisal that led to an increase in grade structure and number of spaces assigned, and in the transfer of the CCIS-70 Project Manager's Office to Fort Belvoir, Va. This transfer aided coordination with the CCIS Group of the Combat Developments Command at Fort Belvoir and placed the project manager near the AMC Headquarters. The Army Electronics Research and Development Laboratory at Fort Monmouth, N. J., provided support to the CCIS-70 Project Office in the tactical equipment area until February 1963 when a separate unit called the CCIS-70 Systems Office began to furnish this support. The obligation of RDT&E funds for this project in Fiscal Year 1963 totalled \$196 million. The Fiscal Year 1964

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68

CCIS-70 Project Manager, Annual Summary, FY 63, pp. 1-5.

obligations were considerably less because of the changing concepts concerning this system and of the delay by the Defense Director of Research and Engineering in providing specific guidance until<sup>69</sup> the latter part of the fiscal year.

### SATCOM

The nature of the Satellite Communications System and the problems surrounding the execution of the program resulted in an unusual project management situation and critical management relationships. Under this project, the Department of the Army was responsible for the ground communications portion of the tri-service satellite communications system. To accomplish this task, a complex arrangement of management relationships evolved. On 23 May 1962, the Secretary of Defense assigned to the Department of the Army the responsibility for the ground communications portion of this program under the integrating direction of the Defense Communication Agency (DCA). On 5 July 1962 the Secretary further defined the DA responsibility in meeting the performance and schedules specified by the DCA. Under these managerial arrangements, the ASA(R&D)<sup>70</sup> had direct access to the project manager of the SATCOM.

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<sup>69</sup>

Intvw, Author with Norman Bader, CCIS Project Manager's Office, 27 May 64.

<sup>70</sup>

SATCOM Project Management Master Plan (PM<sub>2</sub>P), 15 Nov 63, p. 9.

Like other AMC project managers, the SATCOM manager was immediately responsible to the Commanding General, AMC, and exercised full line authority. However, under the management relationships in the SATCOM project, the manager had direct communications with, and received guidance from, the Department of Defense concerning program approval, funding, and unresolved problems. Furthermore, the DCA communicated directly with the project manager for purposes of technical scheduling, integrating exchange of information, and coordinating planning. In 1961, the Defense Director for Research and Engineering had directed that the Department of the Army support the NASA for Project SYNCOM, and had delegated this as a SATCOM responsibility. Late in 1963, the Director further assigned the responsibility for the management and implementation of the planned communications support of NASA's Project SYNCOM to the DCA. <sup>71</sup>

As indicated above, the management of the DA responsibility for the SATCOM was characterized by a number of special and unusual relationships between the project manager and various levels of the Department of the Army, the Office of the Secretary of Defense, and the DCA. The position of the Department of the Navy as the action agency for the Department of the Army for shipboard installations added another element which required interservice coordi-

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<sup>71</sup>

Ibid., p. 1.10.

nation and planning. Furthermore, planning relationships had to be maintained with the Department of the Air Force to insure development of a coordinated system.

72

### Special Warfare

Because of the increasing attention then being given to activities in the field of special warfare, the Commanding General, AMC, established a Project Manager for Special Warfare in November 1962. He desired to be more completely responsive to the needs for Special Warfare items emanating from the DA staff level and from action agencies and activities. This project involved urgently needed items used by special forces groups, including assistance to indigenous forces engaged in psychological warfare operations.

73

The duties of the Project Manager for Special Warfare were very broad in scope, involving the procurement and modification of some commercial items, some Government-Furnished Equipment (GFE), and the expediting of numerous items needed quickly. To facilitate procurement, the project manager had two facilities--one at Aberdeen Proving Ground for "hard goods", such as radios, and one at the

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(1) Ibid., p. 1.10. (2) Intvw, Author with Lt Col Bernard J. Pankowski, SATCOM PMSO, 24 Apr 64. (3) Ltr, CG, AMC, to CRD, DA, 29 Nov 63, sub: Management Relationships in the Defense Communications Satellite Program (DCSP).

73

Ltr, Hqs, AMC, to CS, DA, 8 Nov 62, sub: Establishment of a Proj Managership.

Natick Laboratories for "soft goods", such as articles of food and clothing.

The Special Warfare Project Manager's Office was unique in that it had charge of many varied items and in that many of the regular project management policies and procedures did not apply to this office. Under Project Switchback the office expedited requirements for high-priority items for overseas operations. Under Project Agile, an Advanced Research Project Agency (ARPA) project, the Special Warfare Project Manager monitored troop and concept testing and the modification of commercial items of GFE for use in combat. This office prepared weekly and bi-weekly reports for the Commanding General, AMC, but it did not prepare a Project Management Master Plan and it was not involved in the application of Pert/Cost. This project manager's staff was among the smallest of all such offices in the AMC.

#### Main Battle Tank

In August 1963, by an agreement between the Secretary of Defense of the United States and the Defense Minister of the Federal Republic of Germany, the two nations committed themselves to a

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(1) Intvw, Author with Charles Dickerson, Special Warfare Project Manager's Office, 22 Apr 64. (2) AMCR 715-15, 27 Aug 62, sub: Quick Reacting Procurement System.

cooperative, cost-sharing development program for a new main battle tank. Through this joint effort, these countries planned to develop a tank that would be tactically superior to any existing one and would, at the same time, offer substantial reductions in production and logistical support costs.

Because of the international aspects of the program, the scope of technical and engineering problems that had to be resolved, and the necessity for international agreement and standardization on tactical requirements and engineering procedures, this program offered challenges never before encountered. Since the program represented an international effort, it was necessary that normal plans and operation procedures be modified to make them acceptable to both nations.<sup>75</sup>

As project manager, Maj. Gen. Welborn G. Dolvin with his German counterpart formed the Program Management Board. General Dolvin, as Project Manager, reported directly to the Commanding General, AMC. As the U. S. Program Manager, he was directly responsible to the Chief of Staff of the Army.<sup>76</sup>

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<sup>75</sup>  
PM P US/FRG, Main Battle Tank Project Management Master Plans, Office of<sup>2</sup>U. S. Project Manager, 15 Nov 63, p. i.

<sup>76</sup>  
(1) AMC GO 52, 12 Sep 63, sub: Office of the U. S. Program Manager and the US/FRG Cooperative Tank Development Program and Project Manager, MBT, Wash., D. C. (2) AMC GO 66, 18 Oct 63, sub: US AMC Main Battle Tank Liaison Office, Bonn, Germany.

All joint expenditures had to be approved by the Assistant Secretary of the Army (R&D) and his German counterpart. The two countries managed the tasks through a joint engineering agency. All joint teams or working groups were responsible to this agency. The Department of Defense established broad policy guidance along with the German Minister of Defense.

#### General Application

Concern in the Department of Defense over lengthening lead time in development and production led to the application of the project manager concept to nearly all high-priority weapon systems. Most of these projects involved the development and production of a guided missile, an aircraft, a transport or a combat vehicle, an ammunition item, a communications system, or other electronic equipment. The basic approach was that one man was assigned complete management responsibility for an important item of materiel for the purpose of maintaining a balanced program. In general, the Department of the Navy and Air Force applied the project manager concept to its big missile and aircraft programs. As indicated above, the Department of the Army's projects were more varied in

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(1) Intvw, Author with Maj Edward P. Freeman, MBT Proj Manager's Office, 22 Apr 64. (2) PM<sub>2</sub>P, US/FRG, Main Battle Tank Project Master Plans, 15 Nov 63, pp. 3-4. See Appendix 1 of this PM<sub>2</sub>P for a copy of the Agreement Between the U.S. of America and the Government of the Federal Republic of Germany for a cooperative Tank Development Program.

nature than those of the other two services.

Although the project manager's charter clearly defined his overall responsibilities, the nature of his project determined the method and the extent of the application of the project manager concept. Furthermore, the nature of the project determined where the work on the project-managed item would be accomplished. For example, much aeronautical research on some Army aircraft was done outside the Department of the Army. The personnel strength and operations of most projects usually remained relatively stable. In some projects, however, it sometimes became necessary to reduce sharply the work force as the weapon progressed through the development-production cycle. Project management became a permanent, though exceptional, form of management within the AMC because it was a means of adjusting to rapid program changes and because of the increasing importance of planning and analyzing weapon systems in terms of their contribution to the total Department of Defense mission.

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78

For a discussion on the flexibility of project management, see Rent, AMC Board, 29 Nov 63, sub: Evaluation of New Management Concept, pp. 29-33.



CHAPTER VI  
PROJECT MANAGEMENT PERSONNEL

Staffing Project Manager Offices

Initial Staffing

Commenting on a problem that faced not only project management personnel but all personnel in the AMC when it was established in the summer of 1962, Maj. Gen, William J. Ely, Deputy Commanding General, observed: "The Indians are fighting a major problem in re-establishing the informal relationships they had before, the contacts that I sometimes am convinced are what really makes an organization run."<sup>1</sup> In general, project management personnel were concerned with the same problems that confronted all other Command personnel with one vital exception. Unlike most personnel assigned to positions in the Command, project management personnel were plagued by uncertainty about job security and what would happen to them when a project manager's office to which they were assigned was terminated. Inherent in the project management concept was the idea that any specific project manager's office would remain in existence only until it accomplished its assigned mission. To

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<sup>1</sup>  
C. W. Borklund, "People and Project Managers", Armed Forces Management (Oct 1962), p. 22.

indicate the dispersal of a project manager's office, its records, and its personnel upon completion of assignment, Army personnel coined the term "deprojectized."

Brig. Gen. W. H. Harris, Director of Personnel and Training, said: "We want to solve both the job and indoctrination problems on an individual name basis. We don't intend to give them the broad brush treatment and impersonal theory approach".<sup>2</sup> Meanwhile, until a solution could be found operations had to be continued. As Brig. Gen. F. P. Campbell, then Chief of Staff, remarked: "Programs can't stop just because managers are changing addresses."<sup>3</sup>

Providing personnel to meet the special staffing needs in the diversified skills required for project management posed a problem for the AMC. To accomplish this, the Command assigned personnel who were already working on the project or in allied areas, or it drew them from among those who were registered in existing Army-wide career programs. Furthermore, under DA direction, it developed a career system for staffing project management offices, on a priority basis, from among the employed personnel possessing skills utilized in project management operations.<sup>4</sup>

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Ibid., p. 23.

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Ibid., p. 22

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Quarterly Report, Civilian Personnel Narrative Report -- Summary of AMC-wide Activity, 4th Quarter, FY 1963, p. 2.

The project manager's staff was usually small and compact. He used certain common services provided by the command to which he reported, such as legal, personnel, information, and house-keeping. In other fields, however, it was necessary that he have the level of skill normally expected of division chiefs in a functional organization. This staff was necessary in order to enable the manager to do the required planning, to predict problem areas, to take corrective action, and to be wholly and immediately responsive to demands from higher echelons.<sup>5</sup>

#### Personnel Requirements and Strength

Initially, there were very sketchy personnel requirements for each project management office, and, in most cases, they included only two or three people. For example, 13 project managers, called upon to staff their offices, initially submitted requests that totaled 35 civilians and 8 officers for the Washington area and 23 civilians and 7 officers outside Washington. The initial requirements should be looked upon as academic rather than real. These piecemeal requests highlighted the need for a method of assigning these personnel and prompted the suggestion that a project manage-

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<sup>5</sup>  
Memo, CG, AMC, for DCSPER, 7 Jan 63, sub: Grade Structure for Proj Mgr Offices.

ment office or agency, located at Fort Lee or Aberdeen as a Class II activity, could serve this need. There was also the question of the extent to which project managers would control these people. There were two views relative to personnel requirements. One held that only a small "hard core" of technical specialists was needed; the other maintained that the project manager should control all personnel on the staff of a major subordinate command who were working full time, and would continue to do so indefinitely, on his project. In July 1962, the Secretary of the General Staff, AMC, noted that this latter concept was to be followed.<sup>6</sup>

Following the submission of the initial requirements for project management personnel, Command representatives discussed the question of requirements with Dr. Paul Cherington of United Research Incorporated. He presented estimates that ranged from 2,172 for the "hard core" requirement to 11,252 for the requirement that would include all personnel working full time on the project. Dr. Cherington discussed such problems as the difficulties of attracting and holding good employees and the effect of recruiting for project managers' offices on the functional staff. He

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<sup>6</sup>  
MFR, Col John M. Christensen, Jr., SGS, AMC, 9 Jul 62,  
sub: Pers Requirements for Proj Mgr Offices.

believed that the largest hurdle would be overcome if proper arrangements could be made with the Civil Service Commission for a guarantee of continuity of service and if an adequate grade structure could be provided. The AMC Director of Personnel and Training indicated that special agreements would be sought with the Commission under which civilians transferring to the project management offices would have their rights protected.<sup>7</sup>

By September 1962, the AMC had approved a total of 1,450 personnel spaces for the project manager offices at the U. S. Army Missile Command alone, which was 179 short of the estimated need. Of the 1,450 total, 1,312 were civilian and 138 were military personnel.<sup>8</sup> The 1,450 were distributed among the missile projects as follows: Sergeant 251, Pershing 334, Missile B 38, Hawk 213, Mauler 78, Hercules 266, FABMDS 5, and Zeus 265. In January 1963, the approved table of distribution called for 1,517 military and civilian personnel spaces for the project-managed missile projects.<sup>9</sup>

The task of staffing the project manager offices proved to be extremely difficult. By January 1963, only 10 out of 31 tables of

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<sup>7</sup> MFR, Col John M. Christensen, Jr., 12 Jul 62, sub: Proj Mgr's Pers Meeting.

<sup>8</sup> Ltr, Brig Gen Fred P. Campbell, CS to CG, MICOM, 5 Sep 62, sub: Activation Plan.

<sup>9</sup> 1st Ind, CG, AMC, to CG, MICOM, 18 Jan 63, sub: Civ Grade Structure - Proj Mgr Activities.

distribution for project managers' offices had been approved. At that time, only 62 percent of the personnel needed by the project managers were on detail with those offices. Only 5 percent of the offices had reached between 90 and 100 percent of their personnel requirements, and some were as low as 10 to 15 percent. <sup>10</sup>

The overall personnel strength of the project management offices, which remained relatively constant for the first 6 months of the Command's operations, began to rise slowly. By mid-July 1963, it had risen to 3,133 and by the end of December to 3,216. <sup>11</sup> In some of the offices there was a large turnover of personnel. For example, in the Caribou office there was a turnover of almost 70 percent during Fiscal Year 1963. At no time during that year were more than 50 percent of the personnel spaces authorized for the Caribou Project Manager's Office occupied. The overall personnel placement problems caused by the reorganization, which resulted in the establishment of the AMC, contributed to this situation. However, this was also caused partially by a reluctance of personnel to locate in an organization that faced the imminent prospect of termination or movement from the Washington area. <sup>12</sup>

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<sup>10</sup>  
Memo, C/DP for SGS, AMC, 7 Jan 63, sub: Status of Proj Mgt Organization.

<sup>11</sup>  
(1) AMC rept, prepared by C/DP, Oct, 1963, sub: The First Year, p. 70. (2) See Table 2.

<sup>12</sup>  
Annual Summary, Caribou Project Manager, FY 1963, p. 1.

Table 2 - Personnel Authorization in Project Managers' Offices  
31 December 1963

Project	Gen Off	Col	Lt Col	Maj	Capt	Lt	WO	Enl	Total Mil	PL 313	16	15	14	13	12	11	9	3-8	Wage Bd	Total Civ	Grand Total
AACOMS		1	2	2					5				4	10	3	2		9		28	33
Aircraft Weapons		1	1						2				4	9	8	1	3	10		35	37
AN/VRC-12 AN/PRC-25		1	2	1	1				5				3	5	5	2	1	7		23	28
AR-15 Rifle		1	1	1					3			1	2	9	1			4		17	20
CCIS-70		2	5	10	7	4		131	159		1	4	13	20	24	11	6	39		118	277
CV-7A		1	1	1					3				3	5	10	2		9		29	32
Chinook		1	2	2					5			2	3	12	2	15	8	24		90	95
Combat Vehicles		1	2	1					4			6	10	21	2			15		54	58
Deseret	1	3	8	1	1	4		12	30	1	1	5	8	18	5	2	5	32	4	81	111
FAS		1	1						2			2	2	1				4		9	11
General-Purpose Vehicles		1	2	1				1	5			5	20	30	3	2		25		85	90
Generators		1	1						2				4	6	9	2		7		28	30
Hawk		2	3	3	3	2	7	1	21			5	16	29	44	33	9	58		194	215
Hercules		2	1	3	5		7	2	20			5	15	28	50	52	23	68		241	261
IADS													1				1			2	2
Iroquois		2	1	2					5			3	2	9	29	50	34	27		154	159
Lance		1	2		6				9			6	11	34	14	2	1	27		95	104

185

Table 2 - Continued

Project	Gen Off	Col	Lt Col	Maj	Capt	Lt	WO	Enl	Total Mil	PL 313	16	15	14	13	12	11	9	3-8	Wage Bd	Total Civ	Grand Total
LOH		1	2						3				2	8	9	9	2	13		43	46
M-60 Tank		1		3					4			5	9	17	19		1	16		67	71
MQM-58A (Overseer)		1	3	5					9			1	3	14	11	5	1	17		52	61
Main Battle Tank	1	4	6	2				8	21			2	2	2		2	12			20	41
Mauler		1	4	1			1		7		1	8	19	37	17	6	3	34		125	132
Mohawk		1	1			1			3				3	5	3	1		6		18	21
NBC		1							1				1	1				2		4	5
Pershing	1		3	1	3	6	2	9	25		1	11	26	41	89	18	9	89		270	309
RADAS		1	1	1				1	4				3	2	2		1	6		14	18
SATCOM	1	5	14	2	3	5		28	58	2		16	25	19	11	5	7	41	1	127	185
Selected Ammo		2	1	2	3				8	1		2	11	8	1			11		34	42
Sergeant		1	3	2	4	1	3	1	15			6	19	33	83	17	6	62		226	241
Sheridan/Shillelagh		1	2	1					4			8	18	34	2		1	21		84	88
Special Warfare		1							1								1	1		2	3
UNICOM/STARCOM		1	5	4	3			1	14	1		3	9	21	11	6	3	25		79	93
Zeus	1	2	14	9	7		1	7	41	1	1	25	52	71	30	6	3	66	1	256	297
TOTALS	5	46	94	61	46	23	21	202	498	6	5	131	325	559	519	249	130	788	6	2,718	3,216

Source: Data provided by Office, Special Assistant for Project Management, Hq, AMC.

Similarly, in the Iroquois Project Manager's Office, a total of 25 personnel formed the nucleus of the original organization. Because of personnel turnover, only 12 of these original 25 remained at the end of the first year of operation. This could be attributed to delay in offering permanent assignments to civilian personnel and other Civil Service restrictions prevalent during the reorganization period. These factors had a deleterious effect upon all projects at Headquarters, AMC.<sup>13</sup> While some personnel were apprehensive at first about accepting a position in a project management office, this did not continue to be, over a long period of time, a major staffing problem. Through proper planning and supervision, the project manager overcame his major personnel problems. The Commanding General, AMC, aided in solving these problems by freely loaning temporary duty personnel for peak work-load periods and during emergency situations.<sup>14</sup>

Because the AMC was deeply committed to the project manager concept, the Commanding General considered it essential that an adequate grade structure be provided for the personnel of those offices. He noted that the evaluation made by the personnel advisors did not

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<sup>13</sup>

Annual Summary, Iroquois Project Manager, FY 1963, pp. 4-6.

<sup>14</sup>

Intvw, Author with Col James A. Lewis, Sp Asst for Proj Mgt, 1 Jun 64.

in all cases agree with the alignment desired by the project managers' offices. He therefore requested the Deputy Chief of Staff for Personnel, DA, to have these positions audited as to correctness of allocation and to expedite this work so that those offices would be properly and permanently staffed.<sup>15</sup>

The Commanding General, AMC, directed that careful attention be devoted to the alignment of grades assigned to key positions within the project managers' organizations. He requested that particular attention be given to the relationship of those positions within the subordinate commands to positions located at Headquarters, AMC. In fact, he required that all new or changed positions in grades GS-13 and above receive prior classification approval by the Civilian Personnel Division at Headquarters, AMC.<sup>16</sup> In regular overall surveys of civilian personnel management, the Division favored combining the survey of project managership with the overall survey. It believed, however, that the analysis of special project manager problems and the proposed solutions should be treated separately so that they could be presented quickly to the Commanding General, AMC, as far as feasible.<sup>17</sup>

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<sup>15</sup>

Memo, CG, AMC, for DCSPER, 7 Jan 63, sub: Grade Structure for Proj Mgr Offices.

<sup>16</sup>

AMC Directive 690-1, 7 Sep 62, sub: Classification of Civ Positions in Grades GS-13 and Above Assigned to Proj Mgr Organizations.

<sup>17</sup>

Memo, Brig Gen William H. Harris, D/P&T, 15 May 63, sub: DCSPER Survey of Civ Per Mgt in AMC Hq and Proj Managership.

A DCSPER job evaluation study of AMC project managers' organizations in the fall of 1963 indicated that possibly a high degree of overgrading existed. At the same time, the study pointed out that no recruitment or retention problems existed, that the qualifications of their personnel were high, and that there was a great deal of enthusiasm. In noting the results of the DCSPER study, the Commanding General, AMC, questioned whether these statements would continue to be true if efforts were made to correct the finding of the survey, namely, that possibly a high degree of overgrading existed. However, he agreed that it was desirable to reach an equitable solution to this problem, to protect the employee, and to preserve the project managers' organization. The AMC continued to study this and other personnel problems. Meanwhile, the Command undertook the task of establishing a career system for staffing project management offices.

### Civilian Career Program

#### The Problem

Under the project management concept applied by the Department of the Army, the responsibilities of the project manager's office

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Ltr, CG, AMC, to DCSPER, 14 Nov 63, n. s.

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Intvw, Author with Col John M. Christensen, Jr., USA, Rtd.,  
2 Jun 64.

extended across all facets involved in placing a weapon system into the hands of the user. This required skills, supervision, and managerial ability far beyond those of the functional manager under the traditional organizational concept. Personnel policies and regulations were not geared to recognize these new requirements and, therefore, did not give sufficient emphasis to the non-traditional aspects of procurement, production, and program management generally. The allocation of grades under the prevailing standards was not commensurate with the responsibilities assigned to these personnel. Furthermore, personnel were reluctant to seek employment in the project management offices unless they could be assured of a career in one of the occupations in this area.

Consequently, this created a difficult problem in obtaining and holding personnel with the qualifications needed to manage these important weapon system programs. This emphasis on the project management approach to the development of major weapon systems demanded that some changes be made in civilian personnel procedures. The solution to this problem did not rest wholly with-<sup>20</sup> in the authority of the AMC.

### The Solution

Among those keenly interested in properly staffing the project

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Fact Sheet, CG, AMC, for DCSPER, 11 Apr 63, sub: Need to Adjust Civ Pers Policy to the Requirements of the Proj Mgr Sys.

managers' offices was the Secretary of the Army. In February 1963, he requested that the staff offices of the Department of the Army develop a detailed, phased plan for establishing a career program for civilians in project managers' offices. He took this action as a means of providing the most efficient possible support for the weapon systems management programs. Specifically, the Secretary requested that a pilot program be established for personnel in the 31 project management offices in the AMC. He believed that this action was needed to provide highly qualified personnel who could move from one project to another when project offices were disbanded. Development of the program was to be closely coordinated with the Assistant Secretary of Defense (Manpower). The Secretary established a committee, chaired by the Deputy Chief of Staff for Personnel (DCSPER) and on which the AMC was represented, to draft a plan outlining the scope of the proposed career system, its content, and a phasing schedule. <sup>21</sup> Late in March, in referring to the request of the Secretary of the Army, the Commanding General, AMC, suggested that consideration also be given to the establishment of a career pattern for military personnel assigned to duty <sup>22</sup> in project manager offices.

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(1) Memo, SA for CS, 27 Feb 63, n. s. (2) Memo, SGS, DA for DCSPER, et al., 7 Mar 63, sub: Proj Mgrs.

22

Ltr, CG, AMC, to OPO, 26 Mar 63, sub: Career Patterns for Mil Officers in Proj Mgt.

In reply to this suggestion, the DCSPER noted that the Secretary of the Army had referred specifically to a career program for civilian project management personnel. Although he expressed concern that there be a ready source of highly trained officers for project management, the DCSPER believed that the existing Logistics Officer, Research and Development, and Atomic Energy Programs included a sufficient number of qualified officers, who would qualify as project managers, to meet the requirements. The DCSPER believed that there were many other qualified officers, who were not members of these special programs, who could be added to the pool of talent to help meet the requirements. Since it appeared that the requirements could be met, he decided that military personnel would be assigned to manage selected weapon systems from the existing sources of qualified officer personnel.<sup>23</sup>

In March 1963, the DCSPER forwarded an outline of a pilot civilian career system to the Secretary of the Army.<sup>24</sup> The latter approved the outline of the plan on 13 April, and on 26 April assigned responsibility to the AMC for the development and implementation of the career system for civilians in project managers'

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<sup>23</sup>  
1st Ind, DCSPER to CG, AMC, 12 Apr 63, sub: Career Patterns for Mil Officers in Proj Mgt.

<sup>24</sup>  
Summary Sheet, DCSPER to SA, 20 Mar 63, sub: Proj Mgrs.

offices as set forth in the approved outline.

Even as the Civilian Personnel Division, AMC, was working to complete the career program for civilians in project managers' offices, the Personnel Panel of the OSD-sponsored Program Management Conference, held in May 1963 at New London, Conn., observed that current plans needed very little adjustment to accommodate project management. The conference leaders, including the Commanding General, AMC, found this difficult to accept. Following the conference, General Besson alerted the DCSPER to the renewed interest and great demand for civilian and military career training in the field of project management. He was of the opinion that the Department of the Army should move ahead, if possible, and make the necessary career changes rather than wait and be directed to do so by the Secretary of Defense.

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Meanwhile, under the chairmanship of the Chief of the Career Management and Development Branch, Civilian Personnel Division, AMC, a steering committee organized into work groups covering the basic areas, such as career patterns, registration, and reassign-

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(1) Ltr, TAG to CG, AMC, 26 Apr 63, sub: Career Sys for Civ in Proj Mgt Offices. (2) DF, Brig Gen William H. Harris, D/P&T to C/DP, et al., 9 May 63, sub: Same.

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Ltr, Lt Gen Frank S. Besson, CG, AMC, to Lt Gen James L. Richardson, Actg DCSPER, 27 May 63.

ment, completed the proposed career plan and forwarded it to the  
DCSPER on 26 June 1963.<sup>27</sup>

On 9 July, the DCSPER notified the AMC that the Secretary of the Army had approved the draft of the program document for the project management career system. The DCSPER proceeded with plans to issue this program document as a DA civilian personnel regulation about 1 September 1963. As planned, the program was to be fully implemented within 120 days after its publication, which was scheduled for 1 September 1963. Thus, the directive was expected  
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to be implemented by 1 December.

Because the civilian personnel regulation was not published until 31 October 1963, the plan could not be implemented as soon  
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as had been planned. Consequently, the DCSPER extended the time for registering personnel in the plan. The AMC expected to register all civilian project management personnel in grades GS-7 and above in other than clerical positions and have all information

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(1) 1st Ind, CG, AMC, to DCSPER, 26 Jun 63, sub: Career Sys for Civ in Proj Mgt Offices, on ltr, TAG to CG, AMC, 26 Apr 63, sub: Same. (2) Summary Sheet, DCSPER to CS, 28 Jun 63, sub: Proj Mgrs.

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(1) Memo, D/Pt for CG, AMC, 10 Jul 63, sub: Career Sys for Proj Mgt. (2) Annual Summary, Civilian Personnel Division, P&T Directorate, FY 63, p. 11

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DA CPR CP2, Army Civ Career Sys for staffing Proj Mgt Offices, 31 Oct 63.

in by 31 July 1964. With the help of the Data Systems Office,  
the Personnel and Training Directorate expected to have the  
career plan data fully automated by 1 September 1964.<sup>30</sup>

The career system set forth in the DA regulation made maximum  
use of all Army-wide career programs for those occupations used  
in project management. The system provided for a method of identi-  
fying individuals as potential candidates for project management  
positions. The AMC Project Management Personnel Evaluation  
Board screened all registrants for a talent bank.<sup>31</sup>

The Directorate of Personnel and Training provided the presi-  
dent for this Board. It was composed of members from this Di-  
rectorate, the Office of the Special Assistant for Project Manage-  
ment, and one member from each of the fields of engineering, science,  
procurement and production, supply and maintenance, and comptroller.  
The members designated to represent occupational areas were se-  
lected from civilian and military personnel by the Director of  
Personnel and Training on the basis of nominations submitted by  
the Special Assistant for Project Management. The Board evaluated  
the records of prospective registrants for the Army Civilian Career

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Intvw, Author with A. J. Holm, Civilian Personnel Division,  
4 Mar 64.

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(1) Ibid. (2) AMC Memo 15-7, 16 Apr 64, sub: Boards,  
Commissions, and Committees: AMC Proj Mgt Pers Evaluation Bd.

System for Staffing Project Management Offices. It classified each registrant as outstanding or as being well qualified, or possessing minimal qualifications. It also notified prospective registrants of their acceptance in the system and received all career appraisals of project management employees.

Since this career system represented a departure from the usual approach to career management, added emphasis and publicity were necessary to insure that employees had full knowledge of the opportunities in this special area. According to the applicable regulations, all levels of management were to be made cognizant of their responsibilities in the selection and training of individuals in sufficient numbers to meet the immediate and long-range staffing needs of each occupational specialty. To facilitate the overall staffing, the Civilian Personnel Division prepared a set of standardized job descriptions for representative managerial positions, such as project manager, deputy project manager, technical director, chief of procurement and production, chief of program management, aerospace engineer, program analyst, quality control specialist, and management analyst. The AMC Headquarters maintained a central qualifications inventory file for all employees registered in the career system. The area of consideration for filling project manage-

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Ibid.

ment positions was Army-wide. All vacancies at grade GS-9 and above were filled by selection of individuals from the referral lists.<sup>33</sup>

When positions were open, the Civilian Personnel Division checked the talent bank to see if a particular individual was available. The overall purpose of the career system was to provide a reservoir of personnel to support the project managers for priority weapon systems. It was expected to enhance the opportunities for such employees, establish special training in project management techniques, provide job security for project management personnel, and permit centralized control of project management staffing. Under the new career system, maximum use was to be made of existing career management programs.<sup>34</sup>

Thus, the career system provided the means to meet the special staffing needs in the diversified skills required for project management operations. To accomplish this, since the majority of project management personnel were registered in existing Army-wide career programs, the project managers could draw as needed from

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<sup>33</sup>  
(1) DA CPR CP2, Army Civ Career Sys for Staffing Proj Mgt Offices, 31 Oct 63. (2) AMC Bull No. 2, 3 Jun 64, sub: Civ Career Sys-Proj Mgt.

<sup>34</sup>  
(1) Ibid. (2) Annual Summary, Civilian Personnel Division D/PT, FY 63, p.11.

among more than 57,000 currently employed DA personnel who possessed skills utilized in project management operations. Furthermore, the system provided for priority placement, Army-wide, for project management personnel in the event of a cutback or phasing out of operations in a project management area.

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### Project Manager Qualifications

In commenting on the career pattern for military officers in project management in March 1963, General Besson outlined the qualifications of a project manager as follows:

Project manager should be under 45 years of age, good appearance, sound judgment, aggressive, forceful, outstanding personality, able speaker and writer, leader. The individual should have those characteristics, abilities and background that are commonly regarded as desirable in a general officer.

He further stipulated that the manager should be in the grade of lieutenant colonel, colonel, or brigadier general and should have attended one of the service schools.

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The requirement for highly trained officers capable of managing intricate weapon systems presented a challenge to the AMC. The individuals selected as project managers had to have not only a broad background in the weapon system, or related commodity field, but also wide training in management techniques in order to dis-

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Narrative Rept, Summary of AMC-wide Civ Pers Activity, Fourth Quarter, FY 1963, (RCS CSGPA-663).

36

Ltr, CG, AMC, to OPO, 26 Mar 63, sub: Career Pattern for Mil Officers in Proj Mgt.

charge the responsibilities associated with, in some cases, billion-dollar programs. The performance and timely delivery of a weapon system might be directly attributable to the manner in which the project manager performed his duties. General Besson believed that the required qualifications and the need for timely replacement of project managers called for a careful screening, training and scheduling program to insure an adequate supply of outstanding officers.

Because of the tremendous growth in the complexity, size, and cost of defense programs, the AMC faced the necessity of manning its project manager offices with experienced program officers. In his comments before the DOD Conference on Program Management, in May 1963, the vice chairman of the board of a large industrial corporation said:

The biggest and toughest program management jobs are now clearly in the government. A first-class program manager has to be quite a guy. A man is not necessarily a good manager because he is a good professor, a brilliant scientist, an outstanding personal salesman, a great military strategist, a successful attorney, or an exceptional practitioner in numerous other specialized occupations requiring intelligence, education, and talent.

He defined management as something special and different from other occupations and remarked that a capable manager possessed a set of special attributes, innate talents, experience and train-

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Ibid.

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ing.

While systems engineering was concerned with the item as a whole, a good engineer, the speaker maintained, was not necessarily a good manager. An engineer might be inherently unsuited for management, although he sometimes automatically, or by default, might become a project manager. One way of insuring good management for big projects, he suggested, was to select someone who had managed well another such project. This suggestion indicated a need for a project manager career program with the necessary training and apprenticeship to develop managerial capabilities. 39

An interesting question in management was whether the project manager should be a civilian or a military officer. Almost, certainly, some individuals from the military and some from civilian life would rank high as managers. Perhaps, the industrialist noted, the choice should vary with the nature of the position. In either case, the ideal manager for large programs, he maintained, was an individual who not only had the necessary capabilities but who had certain experience with industry, science, technology, economics, the workings of the government, and military operations. 40

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Abstract, Address by Dr. Simon Ramo, Vice Chairman of the Board, Thompson Ramo Wooldridge, Inc. before DOD Conference on Program Management, New London, Conn., 16 May 63, sub: The Program Manager -- Substance or Symbol?

39  
Ibid.

40  
Ibid.

Addressing a Project Managers Class at Fort Lee, Va., in March 1964, the AMC Director of Personnel and Training elaborated on military career management. He explained that the basic career patterns were designed to develop officers in a variety of fields, a number of which were incorporated in the job requirements of any single project manager. The purpose was to develop an officer's inherent capabilities, aptitudes, and interests. During the first 8 years of military service, the young officer learned his trade and got a chance to apply this knowledge in his branch. He was not accepted into the Logistic Officer Program until he had had 12 years of service and, in many instances, an advanced degree.<sup>41</sup>

According to the Director of Personnel and Training, a project manager should have a well-rounded background in research, development, logistics, personnel administration, and general managerial positions. Furthermore, he believed the manager should have a working knowledge in several fields of science, and a good understanding of contracting, production, purchasing, and marketing. To these qualifications, he added the desire to accept responsibility and to work long hours, the readiness to travel, and the willingness to face separation from his family. In answer to a question on the need for a special military career program for project

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<sup>41</sup>

Presentation, by Brig Gen William H. Harris, D/PT, before Proj Mgrs Class, Fort Lee, Va., 4 Mar 64.

managers, the Director replied that he could see no necessity for such a program as long as the AMC continued to obtain the quality of military personnel that it had in the past.<sup>42</sup>

In summarizing in a graduation address the qualifications of the project manager, the Deputy Commanding General, AMC, stated that this individual should be truly outstanding. He believed this meant a high standard of education, demonstrated executive skill, experience in the specific fields involved, and good physical and mental health. To aid in filling project manager positions in the future, he explained that the Command was looking for young graduates of senior military schools who had a potential ability for advancement to general officers to become project managers.<sup>43</sup>

Assessing the caliber of the AMC project managers, General Besson judged that the Command had some very good ones and might have had some who were not so good. On the other hand, he added: "I have a great faith in the ability of people to expand in proportion to the jobs given them."<sup>44</sup> Since the project management

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<sup>42</sup>

Ibid.

<sup>43</sup>

Graduation address, by Maj Gen Jean Engler, to Proj Mgr Class, Fort Lee, Va., 13 Mar 64.

<sup>44</sup>

Lt Gen Besson, Jr., "I Don't Expect Project Management to Solve All the Problems," Armed Forces Management, (Oct 1962), p. 19.

concept emphasized positive control and rapid decision making on the part of the manager, there was great need for instruction on objectives and policies, and training in the methods of applying the techniques of management.

### Replacement of Project Managers

One of the most pressing personnel problems in the AMC was the replacement of project managers. Their positions were important because they exercised the full authority of the Commanding General in the control of the planning and direction of all phases of research, development, procurement, production, distribution, and logistical support of high-priority weapon systems.

At the direction of the Chief of Staff, AMC, the Military Personnel Division, in the fall of 1962, prepared a list showing the approximate date of departure of each of the project managers with the reasons for departure. Approximately one third of them were scheduled to depart by the summer of 1963, another third by the following summer, and the remainder by the summer of 1965. The status of a few officers was uncertain. A large number of the total project managers were completing the 3-year tour in 1965.<sup>45</sup> Five were scheduled for retirement.

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<sup>45</sup>  
(1) DF, Sp Asst for Proj Mgt to D/P&T, 29 Nov 62, sub: Estimated Dates of Departure - Proj Mgrs. (2) DF, Chief, Mil Pers Div, to Sp Asst for Proj Mgrs, 6 Dec 62, sub: same.

Because of the importance of the project manager positions, the AMC, in June 1963, recommended to the Operations Personnel Office, Department of the Army, that replacement action be initiated well in advance of the departure date of the incumbent. 46

It further recommended that officers who were fully qualified for assignment as project managers, be assigned for an overlapping period of from 3 to 5 months. If the officer lacked the complete background for managing the project involved, the Command recommended an overlapping period of one year before the departure of the incumbent. 47

While the AMC did not get all that it asked, the AMC Civilian Personnel Division believed that the Operations Personnel Office, DA, gave the Command excellent cooperation on project manager replacement. That Division believed that the DA Office provided complete information concerning the planned departure of all officers. Generally, the new project manager was available for any necessary orientation for a period of 2 to 4 weeks before the departure of the incumbent. Since there was a good supply of qualified officers, the Civilian Personnel Division considered this overlapping period adequate for the project managers. 48

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<sup>46</sup>  
Ltr, D/P&T, AMC, to OPO, 12 Jun 63, sub: Replacement of Proj Mgrs.

<sup>47</sup>

Ibid.

<sup>48</sup>

Intvw, Author with Lt Col L. D. Mercer, Mil Pers Div, 19 May 64.

However, not all AMC administrators and project management personnel were completely satisfied with the policies and procedures governing the replacement of project managers.<sup>49</sup>

### Defense-Wide Training

The Department of Defense took no immediate action to carry out the Davis Committee's recommendation of 1961 that a common management technique, or approach, for complex weapon systems be formulated. Consequently, this became a major topic for discussion at the DOD Conference on Program Management in New London, Conn., in 1963. A review of the conference proceedings revealed that 15 percent of the recommendations pertained to the Office of the Secretary of Defense alone and another 15 percent was of such nature that joint OSD-Service attention was necessary if meaningful results were to be forthcoming.<sup>50</sup>

According to Deputy Secretary of Defense Roswell Gilpatric, the New London Conference showed clearly the necessity for the accumulation of trained officer and civilian personnel to manage the major weapon programs. Concerning this need, he concluded

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<sup>49</sup> Intvw, Author with Col John M. Christensen, Jr., USA, Ret., 2 Jun 64.

<sup>50</sup> Final Report, Defense Conference on Program Mgt, New London, Conn., May 1963, p. 6.

in September 1963: "A central training establishment, and a curriculum which covers the broad skills required, should be planned and implemented at an early date." He further indicated: "The Assistant Secretary of Defense (Installations and Logistics) should take the leadership in consolidating existing separate activities and developing this Defense-wide training capability." Secretary Gilpatric believed that the conference had convincingly demonstrated that essential problems and skills were common to all weapon system managers, irrespective of military department.<sup>51</sup>

Within 6 weeks after Secretary Gilpatric's instructions to develop a Defense-wide training capability, the Secretary of Defense directed that such a training program be established for logistic management personnel. The major objectives of this new Defense Logistics Management Training Program were to eliminate interservice duplication of subject matter, reduce the number of training courses in the military departments, encourage improvement in logistics management practices through interchange of ideas, and provide skilled, professional personnel.<sup>52</sup>

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<sup>51</sup>

Memo, DSECDEF for Secretaries of the Mil Depts, et al., 19 Sep 63, sub: Weapons Program Mgt.

<sup>52</sup>

DOD Directive 5010.9, 1 Nov 63, sub: Defense Logistics Mgt Training Program.

Under this program, the DOD was to establish joint service courses that would meet the logistics management training needs of all defense organizational components. Faculties were to consist of an appropriate blend of well qualified military and civilian instructors. The training requirements were to be projected on a 5 year basis to permit an orderly selection of personnel and suitable planning of facilities for training. Although the Assistant Secretary of Defense (Installations and Logistics) had the overall responsibility for managing the program generally, the Defense Logistics Management Training Board monitored the training to assure a comprehensive and coordinated program. The chairman of the Board was designated by the Assistant Secretary of Defense (Installations and Logistics).<sup>53</sup>

Under the new arrangements, the military departments were to continue to operate the logistics management courses peculiar to their departments. Each department was to share the expenses for the operation of the program. Each was to continue all of its current courses until the new courses started.<sup>54</sup> Meanwhile, the DOD requested comments from various Defense organizations, including the AMC, on a draft of its proposed comprehensive curriculum

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<sup>53</sup>  
Ibid.

<sup>54</sup>  
Ibid.

for the joint project management course.

At this stage of planning, the AMC reviewed its experience in conducting project management courses to support the position that the Department of the Army should be designated to conduct the Defense-wide training course. The Command had been teaching project management courses at the Army Logistics Management Center at Fort Lee, Va., since 1962. Because of its emphasis on project management, it had developed one of the best files in existence on the problems and techniques of this type of management. All of the services had similar problems in this area. The AMC therefore believed that its training experience should be made available to all of the military departments. In mid-December 1963, the Command awaited an OSD decision on a recommendation to shift the project management course from Fort Lee to the Army Management Engineering Training Agency, (AMETA) at Rock Island, Ill., broaden its content, and offer it to all three of the armed services. Already, the AMETA had been given Defense-wide responsibility in the areas of management engineering and quality control training.

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Ltr, Maj Gen E. J. Gibson, Director of Procurement and Production to James N. Davis, OASD(I&L), 5 Dec 63, n.s.

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"Management Course Shifting?" Armed Forces Management, (Dec 1963), p. 13.

57

Intvw, Author with J. L. Schaffer, Mgt Science Office, AMC 9 Dec 63.

In February 1964, the Command further substantiated the position that the Department of the Army should be given this Defense-wide training responsibility. The concept of weapon system management was not new to the Department. Virtually all weapon systems after the Korean war had been developed and deployed through this technique of management. Under the 1962 reorganization, the foundation for the implementation of project management had been firmly established. The Department of the Army, therefore, had vast experience in not only training personnel in this single manager technique, but also in employing this technique in developing major weapon systems.

In less than 8 months the AMC had trained the necessary personnel and established project management for over 30 major weapon systems. Furthermore, a command of over 180,000 military and civilian personnel was almost completely oriented in this overall concept and philosophy. Through one of the pioneer consultant firms in this field, United Research Incorporated, the Command had gained extremely valuable experience in planning, administering, and conducting project management courses. In addition, the Department of the Army had a vast reservoir of technical knowledge,

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Ltr, Chief, Training Div, D/P&T, to ACSFOR, 26 Feb 64, sub: Designation of U. S. Army as Executive Agent for Proj Mgt Course.

skills in logistics, teaching experience, educational materials, tools of management, and overall in-house capability for the initiation and successful conduct of such a course.

The AMC believed that existing DA educational facilities were capable of absorbing the additional responsibilities necessary to conduct the DOD project manager's course with a minimum of assistance from the Departments of the Navy and the Air Force and the Defense Supply Agency. It further believed that extensive economies could be realized by utilizing the DA capabilities and experience for the conduct of joint courses. In support of this contention, the Command listed the excellent in-house training facilities, such as almost unlimited training aids, a well-trained student support staff, extensive library facilities, computers, air-conditioned classrooms, and large personnel and recreational facilities.

Despite the arguments marshalled by the AMC, the DOD, in March 1964 assigned the responsibility for establishing and operating the Defense Weapons Systems Management School to the Secretary of the U. S. Air Force. The DOD made no formal statement of the reason for assigning this responsibility to the Wright-Patterson instal-

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Ibid.

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Ibid.

lation. According to informal information, this was done because the project management offices located at Wright-Patterson would serve as a "laboratory" for case studies by the students in the management school. This program for training military and civilian personnel to exercise project management responsibility was to be established at the Wright-Patterson Air Force Base, Ohio. Appropriate facilities and personnel were to be transferred to the Department of the Air Force, and the school was to be manned by separate educational institutions under the command authority of the Air University and administered by the Air Force Institute of Technology. The Assistant Secretary of Defense (Manpower), in consultation with other DOD organizational components was to provide policy direction to the Secretary of the Air Force for the operation of the school. Within 60 days after the March directive, the Assistant Secretaries of Defense (Comptroller, Installations and Logistics, and Manpower) in consultation with the secretaries of the military departments were to submit a plan for the execution of the transfer of this training function to the Department of the Air Force.

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Intvw, Author with James N. Davis, OASD(I&L), 3 Apr 64; with Col Lester H. Levine, Chief, Training Div, P&T, AMC, 2 Jun 64.

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Memo, Cyrus Vance, DSECDEF, for Secretaries of the Military Departments, et al., 10 Mar 64, sub: Establishment of the Defense Weapons Sys Mgt School.

Meanwhile, the Command analyzed its project management training needs and the means of meeting such training requirements. Informal DOD guidance had indicated that upon the inauguration of the joint courses, the project management courses at the Army Logistics Management Center (ALMC) and the Army management Engineering Training Agency (AMETA) would be discontinued. The AMC planned to cancel the courses scheduled at the ALMC for August 1964. The AMETA was to change the title of its course on Techniques for Project Management to preclude any misinterpretation of the scope of the course and the level of students who would attend. The new Defense Weapon Systems School was to concentrate on training military and civilian personnel who occupied, or were eligible to occupy, positions for project manager or positions immediately subordinate to the manager. The AMC planned to continue the training of its own project management personnel in the techniques that were peculiar to the Command and to establish a suitable periodic seminar to serve as a forum for discussion of project management problems and procedures.

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MFR, Chief, Training Div, P&T, AMC, 27 May 64, sub: Conf on Proj Mgt Training in AMC.

CHAPTER VII  
IMPACT AND IMPLICATIONS

Overall Perspective

Degree of Success Achieved

Because of the special attention given to project management during the first year of operation, the Command had anticipated a considerable amount of progress. But the benefits derived from this organizational set-up exceeded the anticipated gains. In numerous cases, the AMC accelerated production beyond that which would have been possible under the functional-type organization. Many examples of savings in time and cost could be directly related to the close attention provided by this managerial technique. Furthermore, experience confirmed that the project managers generally used the delegated powers carefully and wisely. To keep the Commanding General informed, an independent staff of the Command made an evaluation of each project manager's performance.<sup>1</sup>

There was a general consensus in the Command, the Department of the Army, the Office of the Secretary of Defense, and among contractors that project management contributed considerably to

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<sup>1</sup>  
AMC Rept, prepared by C/DP, Oct, 1963, sub: The First Year, p. 78.

the achievements of the AMC.<sup>2</sup> Under this type of management, high-level decisions were made consistently and this technique enabled General Besson to give personal attention to a far greater number of important decisions than would otherwise have been possible.

### Problem Areas

Those who were close to its operation, however, could perceive that there still were problems. Some of the problems were considered to be "growing pains" which time would resolve, some of them were fundamental and would not "go away." In a survey of project management in the AMC undertaken by the United Research Incorporated, it suggested a number of studies that should be undertaken in the new year. Among these were studies on the organization, staffing and location of some project offices; the review of project offices as a group in each subordinate command when fully staffed and operational; the relationships between project offices and functional elements throughout the Command; and the training and education of AMC personnel who were expected to work in project offices.<sup>3</sup>

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<sup>2</sup> See, Interim Rept, by United Research Incorporated, 7 May 63, sub: The Impact and Implications of Project Management Within AMC, p. 1.

<sup>3</sup> Ibid., pp. 1-2.

General Besson had reiterated that he did not expect project management to solve all of his problems. He knew that this management system would create some problems. For example, he explained that the types of individuals and skills needed for a successful project office were the very ones which were in short supply and wanted by almost all organizations. With reference to this type of management, General Besson said: "Life in a project office is seldom dull. The challenges are great but the risks are high." On another occasion he warned: "And I don't want to be taken by surprise. I expect the Commander to notify me of critical problems . . . . Project management is not the panacea for all management difficulties in AMC. I expect to have many problems -- but no surprises." In an effort to be fair and objective, General Besson listed the following problems of project management: the opportunity for free wheeling; conflicting instructions at bench level; an invitation to meddle; resistance to change; and the problem of obtaining the quality of personnel needed.

Another problem confronting project managers was that of having too many bosses. For example, in August 1962, the Army's

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<sup>4</sup>  
Presentation, Lt Gen Frank S. Besson, Jr., to USA Electronics Symposium, Fort Monmouth, N. J., 14 Nov 62.

<sup>5</sup>  
Speech, Lt Gen Frank S. Besson, Jr., before Civilian Aides, Pentagon, 3 Dec 62.

Chief of Research and Development indicated that the SATCOM project manager would be responsive to direction from the "Army staff and Army and Defense Secretariat, and the Director, Defense Communication Agency." Concerning this situation, the Deputy Commanding General, AMC, wrote: "This adds up to some four bosses, in addition to the CG, Army Material Command."<sup>6</sup> General Besson was concerned not only with the multi-source guidance in the execution of this project, but with the implications pertaining to other activities under project managers. In late 1963, however, he believed that the complex structure of management was functioning fairly smoothly. He continued his efforts toward operating with the least friction and in most expeditious manner possible.<sup>7</sup>

#### Number of Project Managers

A question of considerable importance, and one to which the AMC devoted much attention, was that relating to the number of projects that should be placed under project management. The Navy Department had project managed only a few of its major programs.

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<sup>6</sup>

Ltr, Maj Gen William J. Ely, Deputy CG, AMC, to Lt Gen Dwight F. Beach, CRD, 31 Aug 62.

<sup>7</sup>

Ltr, CG, AMC, to Lt Gen William W. Dick, Jr., CRD, DA, 29 Nov 63, n. s.

The Air Force Department project managed its big missile systems, which were relatively few in number when compared with the number of projects so managed by the Department of the Army. The large missile programs, however, constituted a relatively large portion of the Air Force Department's total mission. While the more than 30 AMC projects initially placed under project management involved approximately 50 percent of the Command's budget, this represented only a relatively small portion of the total number of projects in the Department of the Army's diversified weapons and equipment programs.

Among Department of Defense and Department of the Army personnel there were divergent views concerning the number of items that should be project managed. In the days when planning for the AMC organization was going forward, there were those who held that project management should be applied only to weapons systems of the highest priority and complexity. There were others who thought that more projects, in addition to those already project managed, should be placed under this type of management.

Early in 1963, Dr. Harold Brown, Director of Defense Research and Engineering (DDR&E), reviewed the management of the projects in the categories of defense research and engineering. As background information on the management of the research and engineering program, he recalled that earlier DOD policy had stated that "it

would seem important to define more accurately the nature of our undertakings, and to match our management policies and procedures to the job we are trying to do." A review at that time and the submission of the Fiscal Year 1964 program and budget led him to conclude that there was not a complete understanding of the new program structure. He had determined also that many projects in engineering and operational system development categories were not controlled under the most desirable management concepts. Dr. Brown, therefore, believed that a project manager, either civilian or military, should be designated for each such project and that the manager should be delegated the authority and control of resources necessary for successful prosecution of the assigned project.

The Office of Research and Development (OCRD), Department of the Army, requested the AMC reaction concerning the placing of all projects in the engineering development and operational systems categories under project managers. While some key AMC personnel believed that such a program was entirely feasible, the general

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Memo, Harold Brown, DDR&E, for Assistant Secretaries of the Army, Navy and Air Force, 18 Jan 63, sub: Management of Research and Engineering.

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DF, Brig Gen John G. Zierdt, Actg Director, R&D, AMC, to Management Science Office et al., 21 Feb 63, sub: Same.

consensus at that time was that the Command had gone about as far as was practicable in establishing project managers. <sup>10</sup> The 31 AMC project managers already managed all part of some 43 projects. Over 2,600 personnel spaces already were assigned to the project managers. The assignment of a project manager to each project in the engineering and operational system development category would require an additional 130 project managers. Furthermore, the wholesale assignment of project managers would not take into consideration the degree of selectivity applied by the AMC, which was embodied in the criteria used in designating a weapon system to be project managed. <sup>11</sup> Although the Command did not agree with Dr. Brown's proposal that all research and engineering and operational systems should be project managed, General Besson believed it feasible to extend this technique considerably beyond the scope of its use at this time. The matter of the number of weapon systems that should be project managed was still under

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<sup>10</sup>

DF, Brig Gen E. G. Hardaway, Deputy for Plans and Programs, to D/R&D, AMC, 28 Feb 63, sub: Same.

<sup>11</sup>

(1) Ltr, Maj Gen F. H. Britton, D/R&D, AMC, to CRD, sub: Management of R&E. (2) MFR, by Maj R. Lamp, Plans and Policy Div, 1 Mar 63, sub: Same. (3) DF, Col John M. Christensen Jr., Sp Asst for Proj Mgt, to D/R&D, 25 Feb 63. (4) For background information on management of research and engineering, including leadtime, costs, program plans, and reporting, see: Memo, DDR&E, for Assistant Secretaries of the Army, Navy, and Air Force (R&D), 9 Oct 61, sub: Management of R&E.

study in the summer of 1964.

Based on the AMC's response, and on a briefing of the DDR&E by Command representatives, the Chief of Research and Development, Department of the Army, decided that the AMC project officer or project engineer system adequately complied with DOD requirements. However, it was agreed that the instructions regarding the use of project officers for research and engineering projects should be clarified.<sup>13</sup> Although several problems remained unsettled, the Director of Research and Development, AMC, issued further guidance, in December 1963, for the technical and managerial aspects of the research and engineering program. The Command continued its efforts<sup>14</sup> to conform to OSD guidelines.

#### Impact on Manpower

Among other problems raised was the draining off of top quality personnel from the functional staffs. As a possible solution, one commander proposed that project manager staffs be limited to a few highly qualified coordinators. The Commanding General rejected

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Intvw, Author with Col James L. Lewis, Sp Asst for Proj Mgt, 25 Jun 64.

13

(1) Intvw, Author with Lt Col Russell J. Lamp, R&D Directorate, AMC, Jun 64. (2) Ltr, CRD, DA, to CG, AMC, 25 Mar 63, sub: Management of R&E. (3) Memo, D/R&D for D/P&P, 25 Mar 63, sub: Same.

14

Memo, D/R&D for Hq, AMC Directorates, et al., 19 Dec 63, sub: Mgt of R&E.

this proposal as a principle but recognized that the AMC had a real problem in balancing its personnel resources between project-managed and non-project-managed items. The Command devoted much study to this problem.<sup>15</sup>

### Contrasting Views

In the early days of the AMC, the views of the impact of project management on manpower varied widely. For example, the editor of a technical magazine wrote:

This will be a most interesting development to watch, especially when thirty "General Bessons" all descend on the Personnel Office demanding the best scientific officer, the outstanding production trouble shooter, the top comptroller and contracting official, and the most knowledgeable man in electronics.<sup>16</sup>

General Besson was of the opinion that since the project manager was a single agent for control and decision in the Command, the manager should have the best available talent to assist him. However, the project manager's staff was generally small and compact and he was under direction to use the common services provided, such as legal, personnel, information, detailed bookkeeping, and in some cases contract administration. But in other fields,

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(1) MFR, James R. F. Woods, Office, Sp Asst for Proj Mgt, 27 Jun 63, sub: Comments of Generals McMorrow and Lynde re Proj Mgt. (2) Ltr, CG, AMC, to CG, WECOM, 2 Jul 63, n. s.

16

Ordinance, (Nov-Dec 1962), p. 322.

General Besson insisted that the project manager needed the level of skill and training normally expected of division chiefs in a functional organization.<sup>17</sup>

A number of AMC administrators expressed concern about the effect of project management on the personnel situation. For instance, Maj. Gen. F. H. Britton, Director of Research and Development, opposed the provisions of a policy directive which stated that the Director would remain cognizant of all research and development related to project-managed weapon systems, and would provide staff assistance to the project manager on RDT&E matters.<sup>18</sup> General Britton believed that a properly balanced research and development program could be maintained only if this function was clearly assigned to him. "Further", he added, "this will permit the most efficient utilization of highly skilled professional R&D people by consolidating projects and skills, rather than decentralize R&D manpower to each of the project managed weapons (equipment) systems".<sup>19</sup>

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<sup>17</sup>  
Memo, CG, AMC, for DCSPER, 7 Jan 63, sub: Grade Structure for Proj Mgr Offices.

<sup>18</sup>  
AMC Planning Directive 24, 12 Jun 62, sub: AMC Concept of Proj Mgt.

<sup>19</sup>  
Memo, Maj Gen F. H. Britton, D/R&D for CG, AMC, 19 Jun 62, sub: Planning Directive No. 24.

In 1963, General Britton felt that the proposed career program for civilian project management personnel might have an adverse effect upon the Research and Development Directorate. He recommended that project management personnel be assigned to the Directorate as an overage. According to his proposal, personnel in this designated pool would be available for project management assignments. When a project manager's office was terminated, its personnel would be given assignments in the Directorate until suitable positions were available in another project office. The Command rejected General Britton's recommendation.

Maj. Gen. Nelson M. Lynde, Jr., Commanding General of the U. S. Army Weapons Command, believed that project manager offices should be kept small. General Besson agreed with this in general but not to the extent of reducing project managers to coordinators. General Lynde further believed that a project manager's responsibility should be limited to development and production, which was similar to the U. S. Air Force concept. The AMC devoted a considerable amount of study to this idea of limiting the project managers in the supply and maintenance areas. During the first year of

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Intvw, Author with William F. Hodgkinson, R&D Directorate, 3 Jun 63.

21

(1) Ltr, CG, AMC to CG, WECOM, 2 Jul 63, n. s.

operation, the subordinate commands at which several project manager offices were located, complained that the project managers took many of their best people. Some of the commanders believed that this would jeopardize them in accomplishing the programs that were not project managed.<sup>22</sup> Admittedly, the project manager concept had provided a means of effectively expediting high priority items. But there was also a feeling that it had caused turbulence and lowered morale in the host organizations.<sup>23</sup>

### Case Studies

Late in 1963, at the request of the Undersecretary of the Army, the AMC made several studies of the manpower allocated to the project managers' offices throughout the Command. All of these studies were favorable to project management in regard to the general impact on the staffing of functional organizations. For example, in analyzing the case study of a Nike-Zeus project office, the Assistant Secretary of the Army (Research and Development) concluded that the office was not overstaffed and that there was not

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Minutes, AMC Commanders Conference, Wash. D. C., 24 May 63.

23

(1) Memo, Chief, Lab Branch, R&D Directorate, to Environmental Science Branch, et al., 5 Mar 64, sub: Annual General Inspection, FY 64, Hq, AMC. (2) Study, by United Research Incorporated, 18 Feb 64, sub: Project Impact -- General-Purpose Vehicles, Generators Combat Vehicles, M-60 Tank, Sheridan/Shillelagh.

an excessive drain of supervisory and technical personnel to the project manager's office. The case study concluded that the Army Missile Command's loss of key personnel to the Zeus project office<sup>24</sup> totaled roughly 7 to 8 percent.

After the Nike-Zeus study, the Assistant Secretary indicated that the AMC should make similar studies of this nature periodically. Consequently, in early December 1963, General Besson directed that a similar study be made of the General-Purpose Vehicles project office. In addition, the office of the Special Assistant for Project Management made a similar study of the Selected Ammunition Project Office.

The General-Purpose Vehicle case study covered two Army Mobility Command projects and three Weapon Command projects having substantial field offices in Detroit, and other organizations in the Detroit area that supported projects directly or indirectly. These organizations comprised the Detroit manpower pool available to staff and support these projects. As of 13 October 1963, the project offices accounted for only 3 percent of the total manpower available and no more than 16 percent of the professional grade categories. Because of the personnel turbulence that accompanied

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24

Presentation, by Col James L. Lewis, Sp Asst for Proj Mgt, to AMC Commanders Conf, Fort Monmouth, N. J., 31 Jan 64, sub: Records to Evaluate Proj Mgt.

the establishment of project management in the Mobility Command, the case study devoted special attention to ingrade transfers and promotions of civilian professional personnel to determine the impact of project management. Approximately one third of the professionals transferred ingrade and the remaining two thirds received promotions either upon transfer or shortly thereafter. These figures, however, should be qualified by the fact that many individuals were due for promotion whether they transferred or not and by the simultaneous upgrading that took place within the Army Tank Automotive Center. Nevertheless, the case study concluded that project management seemed to have resulted in an unusual number of promotions, a situation that would lead to serious difficulties as projects phased down and the promoted individuals sought new jobs in their former organizations, unless new projects were established on a reasonably concurrent basis.<sup>25</sup>

In March 1964, the Office of the Special Assistant for Project Management made a study of the impact of the Selected Ammunition Project on the U. S. Army Munitions Command. Selected Ammunition had been project managed under the Chief of Ordnance since 1961. During Fiscal Year 1961, the value of the program amounted to

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Study, by United Research Incorporated, 18 Feb 64, sub: Proj Mgt Impact -- General-Purpose Vehicles, Generators, Combat Vehicles, M-60 Tank, Sheridan/Shillelagh.

\$70.8 million. However, Fiscal Year 1962 marked the beginning of rapid expansion of this program. The Fiscal Year 1963 program was more than five times larger than that of Fiscal Year 1961.

According to the case study this project office was a classical example of one composed of a small number of competent personnel who devoted their time exclusively to management and decision making. The project staff comprised only 1.8 percent of the total manpower involved in the Selected Ammunition program in the Munitions Command. The study concluded that the small staff in no way impeded the ability of the project manager to get a job done. After 8 months of operating experience, the manager requested a downward revision in his staffing. On 31 December 1963, the professional strength of the Selected Ammunition project office had only .6 percent of the total manpower involved in the Selected Ammunition program in the Munitions Command and Picatinny Arsenal complex, and no more than 1.3 percent in any one grade. The case study concluded that the existing project staffing appeared to be reasonable and that the drain of professional personnel from the functional staffs was insignificant.

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26

Study, by Office, Sp Asst for Proj Mgt, 30 Mar 64, sub:  
Impact of Proj Mgt of Selected Ammunition on U. S. Army Munitions  
Command.

## Summary of Personnel Impact

Of the AMC's total personnel strength, only a small fraction was employed in project management. Only five of the seven major subordinate commands had project manager offices, with approximately 2 percent of the total manpower committed to those offices. Actually, the 3,000 personnel authorized for project manager offices constituted only a small percent of the total number of people who worked on project-managed items. In the fall of 1962, a Command-wide personnel inventory identified approximately 19,000 positions with project-managed items.

A series of studies, beginning with the Nike-X study in September 1963, clearly revealed that the project offices analyzed were reasonably staffed in terms of workload and that the draining of professional personnel from the functional organizations was negligible. Specifically, the project manager staffs in the Detroit area accounted for only 111 out of approximately 1,100 professional personnel in grades GS-12 and above in the Mobility Command-Army Tank Automotive Center complex. These studies clearly refuted the remarks of some critics that the project manager concept had been

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27

(1) Briefing, prepared by Col John M. Christensen, Jr., Sp Asst for Proj Mgt, to CG, AMC, Jan 1964, sub: Impact of Proj Mgt on Manpower Requirements, Personnel Assignments, and Utilization of Scientific and Engineering Manpower. (2) Presentation, by Col James L. Lewis, Sp Asst for Proj Mgt, to AMC Commanders Conf, Fort Monmouth, N. J., 31 Jan 64, sub: Records to Evaluate Proj Mgt.

instituted at the expense of the quality of the personnel in the functional organizations.

Significantly, after August 1962, the five commodity commands where the project manager offices were located experienced a reduction of 5,500 personnel spaces including over 3,000 set aside for project manager organizations. Thus there was an overall net reduction of approximately 2,500 in authorized personnel spaces. While the various studies were helpful in providing positive answers to some of the criticisms leveled at project management, the AMC did not plan to extend the study effort concerning the personnel impact of this type of management. However, it planned to utilize the regular manpower surveys and other normal controls, including inspections, to insure that personnel requirements for project management were consistent with the Command's total resources.

#### Relations with SMC

The AMC was greatly concerned with the proper assignment of supply and maintenance responsibilities in the transition of a weapon from production to deployment. The project managers at some of the commodity commands, especially at the Missile Command, were

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Ltr, Maj Gen William B. Bunker, DCG, AMC, to Paul R. Ignatius, USofA, 1 May 64, sub: Personnel Impact of Proj Mgt.

deeply involved in supply and maintenance functions, while other project managers merely monitored these functions. The AMC devoted much time and effort to the detailed study of the project manager's responsibility beyond the production cycle.

In surveying the problem areas in June 1964, the AMC found that because of the individual circumstances surrounding each project and project office, the conclusions drawn from examination of some project office could not always be applied to all the offices. Contacts between project manager and the Supply and Maintenance Command (SMC) were infrequent and limited almost entirely to matters involving SMC policies or the funding of secondary items.

In its June study, the AMC found that only those problems involving areas in which the SMC had exclusive authority, or where a satisfactory solution could not be reached at lower level, were brought to the attention of the Headquarters, SMC. In general, it found the relations between the project managers and the SMC satisfactory. An exception to this was the lack of information on the performance schedules of the depots, which indicated the need for a single point of contact on depot operations.

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(1) MFR, James R. F. Woods, Office of Sp Asst for Proj Mgt, 27 Jun 63, sub: Comments of Generals McMorrow and Lynde re Proj Mgt. (2) Ltr, CG, AMC, to CG, WECOM, 2 Jul 63, n. s.

30

Study Report, prepared by United Research Incorporated for AMC, Jun 1964, sub: Proj Mgt Interfaces with Supply and Maintenance Organizations within the AMC, pp. II-1-2, III-1, IV-1-6.

31

Ibid., III-2-3, IV-3.

## Problems with Functional Elements

The practice of expediting weapon systems under project management meant the withdrawal of resources from systems that were not project managed and which had less priority. <sup>32</sup> Before the AMC was established, the Chief of Staff, U. S. Army, had warned of the danger of emphasizing project management to the extent that routine but important projects or tasks might be jeopardized through lack of attention. In withdrawing resources to expedite weapon systems under project management, he cautioned that full consideration should be given to the impact of this action on the execution of the work on the other programs. <sup>33</sup>

That the Commanding General of the AMC was aware of possible conflicts between project management and functional control was demonstrated by the following statement:

I recognize that this concept impinges upon the conventional horizontal (functional) control which is classic to the Department of the Army's Management. In each case the project manager has taken from the functional staff or commander a portion of that staff officer's or commander's responsibility insofar as it pertains to the single project. At the same time I expect the project manager will conform to the general policies and practices established by the staff and commanders for each functional area within this Command.

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32

CS Reg 1023, 29 Dec 61, sub: Selection and Termination of Systems for Proj Mgt.

33

Log Directive 10-1, DCSLOG, 8 Mar 62, sub: Selection and Termination of Systems for Proj Mgt.

But to carry out his responsibilities he must not be subordinate to the functional chiefs -- rather he must represent the ultimate blending of functional proficiency in a single individual.<sup>34</sup>

General Besson recognized the fact that the Command could make great improvements in the project management system. Since project management depended upon the functional organizations for support, he realized that these improvements would not be possible if the functional organizations were permitted to deteriorate. Actually the project managers in general had small staffs and therefore depended upon the functional staff for the major operations. The matter of how the project management affected the functional organizations was under constant consideration by the Commanding General and his staff. They realized that the problems of any one element could not be solved in a vacuum but that all elements had to be taken into consideration.<sup>35</sup>

#### Studies and Surveys

Although the Commanding General of the AMC clarified the operational relationships between functional and project elements in

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Memo, CG, AMC, for DCSPER, 7 Jan 63, sub: Grade Structure for Proj Mgr Officers.

35

See, Minutes, AMC Commanders Conference, Wash, D. C., 23 May 63, pp. 16-20

his policy letter of March 1963, experience during the ensuing year indicated that there were still areas that needed further clarification. Consequently, General Besson requested that a series of studies be made on certain phases of project management. Some studies were made by consultants under contract, while others were conducted by AMC personnel. The results of some of these studies had not been analyzed by June 1964, which marked the end of the period covered by this monograph. As a result of these studies it was contemplated that additional policy statements would be issued to further clarify organizational responsibilities and relationships.

Among the project management studies conducted by consultant firms under contract to the AMC were those of the United Research Incorporated, a firm retained by the Command as an advisor on project management. Another contract study, which was prepared by the

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36

Ltr, CG, AMC, to all Directors & Offices, et al., 4 Mar 63, sub: Operating Policies and Organizational Relationships for the Conduct of Proj Mgt.

37

(1) DF, Col John M. Christensen, Jr., Sp Asst for Proj Mgt, to D/R&D, et al., 9 Jan 64, sub: Proj Mgr Relationships. (2) DF, Same to same, et al., 17 Feb 64, sub: Same.

38

(1) Rept, by United Research Incorporated, 7 May 63, sub: The Impact and Implications of Proj Mgt Within AMC. (2) Study Rept, by United Research Incorporated, Jun 1964, sub: Proj Mgt Interfaces with Supply and Maintenance Organizations Within the AMC.

Space and Technology Laboratories (STL) was devoted, primarily to technical data management, but it also contained much material pertinent to project management. For instance, the STL study recommended that the AMC revise its Regulation No. 11-16 on project management to make it truly regulatory in nature and that it expand its scope to cover all stages of the weapon system cycle.<sup>39</sup>

Beginning in January 1963, the Command made elaborate preparations for participation in the Defense Conference on Program Management held in New London, Conn., in May. Col. C. W. Eifler of Frankford Arsenal, a member of the Steering Committee, collected voluminous material on panel subjects for use by discussion groups at the conference. These panel subjects covered such areas as the general concepts of project management, technical management, requirements and programing, financial management, data reporting, staffing, and logistics management.<sup>40</sup>

Another elaborate study conducted by the Command in the spring of 1964 concerned project manager relationships. This study involved the propounding of basic questions on the subject to all pro-

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39

Final Rept, by STL, 28 May 64, sub: Technical Data Management and Implementation Program.

40

(1) Ltr, CG, Hqs, AMC, to Col C. W. Eifler, CO, Frankford Arsenal, 25 Jan 63, n. s. (2) Ltr, Col Eifler to CS, 16 Jan 63, sub: Panel Subjects for Defense Conf on Program Mgt. (3) Ltr, SA, OASD(I&L) to CS, AMC, 29 Jan 63, sub: Same. (4) DF, Sp Asst for Proj Mgt to all Proj Mgrs, et al., 20 Dec 62, sub: Same. (5) Final Rept, DOD Conf on Program Mgt, May 1963.

ject managers and selected functional directors, and, in turn, the  
collection and analysis of the various answers. While no con-  
clusions were reached at the time, some of the replies indicated  
that the functional elements believed the project manager con-  
cept to be basically sound and that there were adequate safeguards  
to the exercise of authority by the project managers. Furthermore,  
the project managers were familiar with the general policies  
established by the functional directors and followed an appropriate  
course to insure a balanced AMC position.

Some functional directors, however, believed that project  
management could be improved by close coordination between the  
project managers and the functional organizations. In a few  
instances, the functional staffs felt that the project managers  
evidenced little or no inclination to comply with the required  
coordination. Other functional directors sensed considerable  
disparity in the operations of different project managers having  
similar missions.

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<sup>41</sup>  
DF, Sp Asst of CG, AMC, to D/R&D, et al., 9 Jan 64, sub:  
Proj Mgr Relationships.

<sup>42</sup>  
(1), DF, Program Br to Chief, Tech Service Div, 24 Feb 64,  
sub: Proj Mgr Relationships. (2) DF, D/R&D to Sp Asst to CG, AMC,  
19 Mar 64, sub: Same.

<sup>43</sup>  
(1) DF, Chief, Lab Br, to Chief, Tech Service Div, 26 Feb 64,  
sub: Proj Mgr Relationships. (2) Ltr, CG, MUCOM, to CG, AMC,  
9 Mar 64, sub: Same. (3) 1st Ind, CG, WECOM, to CG, AMC, 2 Mar 64,  
sub: Same. (4) Intvw, Author with N. R. Holland, Mobility & Weapons  
Div, P&P Directorate, 5 Jun 64.

Still other functional directors were of the opinion that the existing project management regulations had been developed as a result of much time and effort on the part of many organizational elements both at Headquarters, AMC, and in the field. They therefore believed that the official position of the Command on project management should be changed only after full consideration had been given to the impact of such changes.

The Special Assistant for Project Management, at the AMC Management Conference in July 1963, outlined a program for review of project management operations. These proposed actions encompassed all phases of project manager activities, including control procedures, training programs, and project office surveys. These surveys were to be used as a basis for exploring problems and the effectiveness of project management.

### Evaluation

Project Management became a permanent form of management in the AMC because the Command recognized this concept as a means of adjusting to rapid changes in program emphasis; because of the con-

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44

DF, Chief, R&A Div to Chief, F&A Div, 23 Jan 64, sub: Proj Mgt Relationships. (2) DF, Chief R&A Div to Sp Asst, CG, AMC, 13 Mar 64, sub: Same.

45

DF, Sp Asst for Proj Mgt to D/R&D, et al., 12 Mar 64, sub: Draft AMCR Proj Mgt Surveys.

tinued growth in the size and complexity of modern weapon systems; and because of the increasing importance of considering weapon systems in terms of a Department of Defense mission. Adjustments in operating procedures were needed from time to time to preserve a balance in the working relationships between the functional directors and the project managers. The managers were concerned primarily with decisions concerning time, cost, and technical performance of a weapon system while the functional directors were concerned primarily with specialized technical areas.<sup>46</sup>

The basic directions and objectives of AMC project management were clear. In effect, General Besson was the "project manager" and his authority was all inclusive. The AMC concept of project management brought management information and decision making closer to the top levels than any previous system of management. Within the AMC there seemed to be a general consensus that project management contributed appreciably to the achievements of the Command. Even those who were somewhat skeptical supporters of the concept agreed that it had, in many instances, succeeded in bringing problems to the attention of the Commanding General and his staff quickly and forcefully. Enthusiastic supporters claimed much for the concept.

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<sup>46</sup>  
See, Rept, AMC Board, 29 Nov 63, sub: Evaluation of New Mgt Concepts, pp. 32-33.



## INDEX

- ADVENT Communications Satellite, 90
- Advanced Research Project Agency (ARPA), 53, 174
- Advisory Committee on Uranium, 39
- Agile, Project, 174
- Airborne Surveillance System, MQM-58A, 141
- Aircraft Projects
  - AN/USD-2 Airborne Surveillance System, 141
  - AN/USD-5 Drone, 139
  - Caribou, 167-69
  - Chinook, 166-67, 184
  - CV-2B, 168
  - CV-7A, 141, 168-69
  - Iroquois, 80, 134
  - Mohawk, 22-25
- Air Force Institute of Technology, 211
- Air Force, U. S., Department of the
  - Ballistic Missile Division of, 62-64
  - Defense-wide training of project management personnel by, 210-11
  - development of ballistic missiles by, 44
  - PERT used by, 66
  - principles of management used by, 64-66
  - project management in the, 60-64, 217
  - Research and Development Command of, 61, 64
  - Systems Command of, 64
  - testimony before congressional committee on program of, 60
  - von Neumann report on management structure of, 64
- Albrino, Lt. Col. Francis E., 136, 137n
- AMC Activation Plan, 121, 126
- AMC Board, 29-31, 29n, 100
- Ammunition, Selected, Project Manager, 95, 134, 141, 226-27
- AN/USD-2 Airborne Surveillance System, 141
- AN/USD-5 Drone, 139
- Army Air Defense System 70's (AADS-70's)
  - and the program package concept, 35
  - FABMDS replaced by, 35
- Army Ballistic Missile Agency
  - compared with Navy Special Projects Office, 45, 53
  - Chief of Ordnance control of, 53
  - establishment of, 17, 53
  - Jupiter Missile development by, 52-60

Army Ballistic Missile Agency - Continued  
  launching of first U. S. Satellite by, 55  
  organization of, 56-60  
  purpose of, 17, 40, 52  
Army Ballistic Missile Committee, 56  
Army Logistics Management Center, 129, 208, 213  
Army Management Engineering Training Agency (AMETA), 120-26,  
  208, 212  
Army Program System, 109-10  
Army Rocket and Guided Missile Agency  
  establishment of, 53  
  Nike-Zeus, responsibility of, 54  
  subordinate agency of Ordnance Missile Command, 54  
Arsenals  
  Frankford, 234  
  Picatinny, 227  
  Redstone, 53  
  Rock Island, 141, 208  
Assistant Secretary of Defense (Installations and Logistics),  
  102-08, 206-07  
Atomic Bomb. See also Manhattan Project.  
  development of, 27, 41  
  first explosion of, 41  
  first use of in warfare, 41  
Autoprobe  
  definition of, 36  
  relation of project management to, 36-37

Besson, Gen. Frank S.  
  and project management, 117-18, 134n, 221-22  
  appointment of, 18  
  as Chief of Transportation, 85  
  management philosophy of 18, 231-32  
Booz, Allen and Hamilton, 99  
Britton, Maj. Gen. F. H., 222-23  
Brown, Dr. Harold  
  guidelines for project managers by, 220  
  proposal on project managers by, 218  
  reaction to proposal, 218-20  
Burke, Adm. Arleigh, 50  
Bush, Dr. Vannevar, 39, 43  
BZ Chemical System, 139

Campbell, Brig. Gen. F. P., 120, 129n, 180  
Caribou Project Manager's Office, 141, 167-69. See also  
CV-7A Project.  
Cave, Brig. Gen. John W., 72  
Chemical Corps. See also Technical Services.  
    CBR agents as weapon systems in, 86  
    contracting by, 21  
    use of PERT by, 87  
    weapon systems management in, 86-88  
Cherington, Dr. Paul  
    discussion of management by, 117-18  
    examples of project offices by, 119  
    head of United Research Incorporated, 113  
    personnel estimates by, 182  
    report by, 113-17  
Christensen, Col. John M., Jr., 155. See also Special Assistant  
    for Project Management.  
Command Control Information System - 1970 (CCIS-70), 169-71  
Communications System, AACOMS, 139  
Comptroller and Director of Programs, AMC, 148, 153  
CV-2B Aircraft, 168  
CV-7A Aircraft, 141. See also Caribou Project Manager's Office.

Davis, James N.  
    and DOD task force, 102  
    Davis Committee Study on program management, 102-08, 205  
    formulation of common management techniques by, 107  
Davis Committee Study, 102-07  
Davy Crockett Weapon System  
    assignment of responsibility for, 71n  
    project management of, 72-74  
    termination of project for, 139  
Decker, Maj. Gen. George H., 33  
Defense Communications Agency, 172  
Defense Logistics Management Training Board, 207  
Defense Logistics Management Training Program, 206  
Department of the Army Staff Officer (DASSO)  
    AMC reaction to requirements by, 161-63  
    and milestone reports, 155-63  
    coordination by, 157  
Department of Defense Conference on Program Management, 193,  
    199, 205, 234

Deputy Chief of Staff for Logistics, 18  
Deseret Project Manager, 135, 138  
Dolvin, Maj. Gen. Welborn, 175  
Du Pont Company, 30

Eifler, Col. C. W., 234  
Einstein, Albert, 38  
Eisenhower, President Dwight D., 2, 9, 14n  
Electronics Command, 138  
Ely, Maj. Gen. William J., 179  
Engineers, Corps of, 21. See also Technical Services.  
Engler, Maj. Gen. Jean, 202  
Explorer I, 55

#### FABMDS

application of program package concept to, 35  
personnel for, 183, 185  
project manager's office for, 1  
reorganization of, 1  
successor to Plato Missile, 35  
termination of, 1, 139  
Feyereisen, Col. Paul A., 121  
Funds for Project Management  
amount of, 133-34, 152-55  
control of, 154-55  
O&MA, PEMA and RDT&E, 94, 153-55, 170  
project manager appraisal of, 153  
review of program directors, 152-53

Gaither Report, 13-15  
Gardner, Trevor, 60  
General Motors Corporation, 30  
Generators, Project Manager's Office, 139  
George Washington, 49  
George Washington University, 70, 70n  
Ghormley, Brig. Gen. W. K., 73, 74  
Gilpatric, Roswell, 107, 137n, 206  
Groves, Brig. Gen. Leslie R., 40, 40n, 43-44

Guided Missiles. See also guided missiles by name.

- Atlas, 45
- complexity of, 6
- cost of, 7
- Hawk, 183
- Hercules, 183
- Intermediate Range Ballistic Missile (IRBM), 53-54
- Jupiter development, 52-60
- Lance, 125, 141
- management of, 45
- Mauler, 83, 95
- Missile B, 139-40, 183
- number of separate parts of, 6
- Pershing, 183
- personnel for, 183, 185-86
- Plato, 35
- Polaris, 45, 50-52
- Sergeant, 183
- Sheridan/Shillelagh, 70, 77, 120, 141, 183
- Thor, 45
- Titan, 45

Harbridge House, Inc., 129

Harris, Brig. Gen. W. H., 180, 201n

Hercules, 183

Hawk, 183

Hinrichs, Maj. Gen. J. H.

- as Chief of Ordnance, 73

- establishment of Systems Work Assignment Group by, 76, 77

- weapon systems management, 75, 76, 78

Hitch, Charles J., 6, 34, 35

Hoelscher, L. W., 67n

Hoelscher Report

- and project management, 27, 108-11

- and the program package concept, 32

- findings of, 67

- review of, 20

- weapon systems discussion in, 15-16, 18, 109-10

Hoover Commission, 32, 33

Industrial Management  
  changing concepts of, 29  
  decentralized structure of, 30  
  examples of practices in, 29, 30  
  project directors in, 28  
Interim Air Defense System (AIDS), 139  
Italian Government, Memorandum of  
  Understanding with, 135-136

Jupiter Missile. See also Guided Missiles.  
  General Medaris' direction of, 27  
  program of the, 52-60  
  withdrawal of special powers from, 103

Kaiser Aluminum and Chemical Company, 30  
Kennedy, President John F., 10, 32  
Kissinger, Henry A., 3

Lance Guided Missile, 125, 141. See also Guided Missiles.

Lead Time

  cost reduction and, 101  
  Polaris and, 44  
  Robertson report on, 100-101  
  Stanford Research study on, 11  
  Trudeau, Lt. Gen. Arthur G., views on, 11  
  weapons obsolescence and, 11-13, 97  
Livingston, Dr. J. Sterling, 51  
Lutz, Col. Robert R., 1n  
Lynde, Maj. Gen. Nelson M., Jr., 223

Management Concepts

  centralization vs decentralization, 29-31  
  systems management, 69  
  terminology for, 68  
Manhattan Project. See also Atomic Bomb.  
  and Advisory Committee on Uranium, 38  
  atomic bomb development by, 27, 41

Manhattan Project - Continued  
  "cohesive entity" of, 43  
  cost of, 42  
  DA support of, 42  
  Einstein's role in, 38  
  lessons, 43  
  Manhattan Engineering District's relation to, 40  
  official history of, 39n  
  OSRD role in, 39  
  priority a major factor in, 37-38  
  project management example, 103  
  success of, 42-44  
Marshall, Gen. George C., 2  
Materiel Development and Logistics Command (MDLC)  
  comments on, 25  
  Hoelscher report on management in, 109  
  planning group of, 32n  
  preliminary implementation plan, 7, 17-18  
  project management concept for, 117-18  
Mauler Missile, 95, 183. See also Guided Missiles.  
McNamara, Robert S.  
  organizational changes by, 32  
  request for project managers by, 89  
  revision of management techniques under, 10  
Medaris, Maj. Gen. John B. See also Army Ballistic Missile  
  Agency.  
  highlights of his management plan, 56  
  Jupiter Missile program direction by, 27  
  special powers delegated to, 52-60  
Milestone Network Plan, 143  
Missile B, 139-40, 183  
Missile Command, 138, 183, 229  
Mobility Command, 138, 139, 228  
Mohawk Aircraft  
  agencies involved in, 24  
  complexity of, 24  
  development and production cycle of, 22  
  management of, 22-25  
  technical services management of, 24-25  
Munitions Command, 138, 141, 227  
  
Navy, Department of, 45  
NBC Chemical-Biological System, 139

Nike-X Project Manager's Office, 138, 228  
Nike-Zeus Missile. See also Guided Missiles.  
    complexity of, 6-7  
    development of by ARGMA, 104  
    high priority of, 55  
    ICBM interception by, 7  
    management of, 103-05  
    need of stronger management for, 106  
    personnel for, 183, 185  
    prime contractor of, 105  
Nike-Zeus Project Manager's Office, 137, 224-25. See also  
    Guided Missiles.  
Nuclear Weapons, 3, 4, 5, 6. See also Polaris Project.

Ordnance Ammunition Command, 17  
Ordnance Corps  
    Ammunition Command of, 17  
    commodity centers of, 16  
    Missile Command of, 17  
    Office, Chief of Ordnance - Detroit, 16  
    percent of research and development by, 20  
    policy directives for, 69  
    project management in, 89-95, 98  
    SWAG of, 76-77  
    Tank - Automative Command of, 17, 77  
    Training Command of, 74  
    Weapons Command of, 71-72  
    weapon system management in, 69-80  
Ordnance Missile Command, 17, 53, 70  
Ordnance Tank - Automative Command, 17, 70, 77  
Ordnance Training Command, 74  
Ordnance Weapons Command, 73, 74, 78

Pershing, 183. See also Guided Missiles.  
Personnel Carrier, M 113, Co-Production Program with Italy,  
    135-136  
PERT. See Program Evaluation Review Technique  
Picatinny Arsenal, 227  
Plato Missile Program, 35. See also Army Air Defense System 70's  
    (AADS-70's)  
Polaris Project  
    management of, 45, 51-52  
    organization for, 45

Polaris Project - Continued  
   PERT in, 48  
   purpose of, 27  
   unique features of, 50  
 Preliminary Implementation Plan. See also Materiel Development  
   and Logistics Command (MDLC)  
   on project managers, 111-13  
   views on special management in, 17, 18  
 Program Evaluation Review Technique (PERT)  
   as a management tool, 143  
   Cherington report on, 116  
   DOD-NASA Guide on, 129  
   role of AMETA in formation of, 122-24  
   use of, by Air Force, 66, by Polaris Project, 48, 50  
 Program Package Concept  
   application to Plato Missile, 35  
   difficulties in application of, 36-37  
   Hoelscher Committee study on, 32  
   impact of, 34-35  
   implementation of, 34-36  
   use of in decision making, 32  
 Project Management  
   in industry, 29-31, 99-100  
   in technical services, 90-92, 93n, 94  
   master plan (PM<sub>2</sub>P), 123, 144-45, 152, 174  
   problem areas in, 214-16  
   studies and surveys on, 224-27, 233-34, 237n  
   success of, 213-14, 236-37  
   systems under, 133, 140  
   varied application of, 134-35  
 Project Management Offices  
   activation of, 138  
   and functional organizations, 213  
   changes in names of, 139, 141  
   impact of, 220-21  
   location of, 138, 141-42  
   number of, 138, 216-20  
   problems of, 214-16, 231-32  
   staffing of, 179-89  
   table of, 140  
   termination of, 139  
 Project Management Personnel  
   authorization for, 146, 185-86  
   case studies on, 225-26  
   Civilian Career Program for, 189-98  
   Defense-wide training course for, 205

Project Management Personnel - Continued  
  impact on functional staff of, 220-21, 228-29  
  number of, 183-86  
  Operations Personnel Office and, 204  
  military career program for, 191-92, 201-02  
  requirements for, 181-82  
  shortage of, 183-84, 215  
  skills of, 180  
  table of, 185-86  
  talent bank for, 197  
  training of, 204-12  
  turnover in, 187  
Project Management Personnel Evaluation Board, 195-96  
Project Management Training  
  AMC capability for Defense-wide, 208-10  
  AMETA participation in, 120-26  
  course at Fort Lee, 122  
  Defense Logistics Management Program for, 206  
  school for, 128  
  selection of Wright-Patterson Air Force Base as site for, 108  
  single DOD responsibility for, 107, 205-12  
  United Research Incorporated role in, 129-31, 209  
Project Manager Staff Officers, 130, 146, 147  
Project Managers  
  appointment of, 149  
  authority of, 148, 213  
  impact on manpower, 220-21, 228-29  
  problem area of, 214-16  
  qualifications of, 149, 198-203  
  question on number of, 216-20  
  relations with the functional staff, 150, 222-24, 231-32  
  replacement of, 203-05  
  success of, 213-14, 236-37

Quartermaster Corps, 20-21. See also Technical Services.

Raborn, Adm. William F., 27, 50, 52. See also Polaris Project  
Radio Corporation of America, 30  
Ramo, Dr. Simon, 199-200  
Ramo-Wooldrige Corporation, 63  
Rand Corporation, 34

Redeye Missile, 139  
Red-Line Reporting, 150-52  
Redstone Arsenal, 53  
Rickover, Rear Adm. Hyman, 48. See also Polaris Project.  
Rifle, AR-15 (M16), Project Manager's Office, 139  
Rifle, M14, 139  
Robertson Report, 100, 101  
Robertson, Reuben B. Jr., 100  
Rockefeller Report, 13, 14, 15  
Rock Island Arsenal, 141, 208

Satellite Communications System, SATCOM, 134, 141, 171-73  
Schriever, Lt. Gen. Bernard A., 62, 63n  
Sears, Roebuck and Company, 30  
Sergeant Guided Missile, 183  
Sheridan/Shillelagh Weapon System, 70, 77, 120, 141  
Signal Corps, 21, 91. See also Technical Services.  
Space Technology Laboratories, 63, 64, 234  
Special Assistant for Project Management  
    and project management personnel, 195  
    duties of, 148, 156  
    position established for, 154-55  
    projects exempt from control by, 135  
    review of project management by, 236  
    studies by, 226, 233, 235  
Special Projects Office. See also Navy, Department of.  
    adjunct of Bureau of Ordnance, 46  
    authority of, 103  
    director of, 46  
    organization of, 46, 47, 48  
    personnel of, 47  
    purpose of, 46  
Special Warfare Project Manager's Office, 137, 139, 173-74  
Stahr, Elvis J., Jr., 89  
Standard Oil Company, 30  
Stanford Research Institute, 11  
Supply and Maintenance Command, 229-30  
Switchback Project, 174  
Systems Work Assignment Group (SWAG), 76, 77

Tank, M60 Project Manager, 138, 139  
Tank, Main Battle, Project Manager's Office  
    establishment of, 139  
    German cooperation effort with, 174-76

Taylor, Gen. Maxwell, 33  
Technical Services. See also Technical Services by name.  
DCSLOG relation to, 18  
division of responsibility under, 15  
semi-independence of, 98  
Transportation Corps  
contributions of, to AMC project management, 85  
procurement system of, 21  
project management in, 91  
reorganization of in 1959, 81-83  
research and development in, 20  
weakness of management in, 18, 67, 69  
weapon systems management in, 80-86  
Traub, Lt. Gen. David, 32  
Trudeau, Lt. Gen. Arthur G., 11

United Research Incorporated  
and Cherington Report, 58n, 70n, 113-17  
and Davis Study, 114  
study by, on supply and maintenance interfaces, 230n  
training of project managers by, 120, 129-31

Vanguard Project, 55  
Vehicle, General-Purpose, Project Management Office, 225-26  
von Braun, Dr. Wernher, 53  
von Neumann, Dr. John  
Air Force Management Structures Report by, 64  
Strategic Evaluation Committee headed by, 60, 61

Weapons Command, 138, 139, 141  
Weapon Systems Management  
Chemical Corps, practice of, 86-88  
Ordnance Corps, practice of, 69-80  
policies and procedures for, 67-69  
Transportation Corps, practice of, 80-85  
Wilson, Charles E., 100