

**DEFENSE SYSTEMS MANAGEMENT COLLEGE**

**MODERNIZATION IN LEAN TIMES:  
MODIFICATIONS AND UPGRADES**

**Report of the  
DSMC 1994-1995  
Military Research Fellows**

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# PREFACE

This report summarizes an 11-month research fellowship by three Military Research Fellows. This program is sponsored under the auspices of the Under Secretary of Defense for Acquisition and Technology (USD(A&T)). The program has two primary goals: first, it provides an advanced professional education for selected military officers from the Army, Navy and Air Force; second, it provides an independent report in an area of interest to the Department of Defense (DoD) acquisition community. The Defense Systems Management College (DSMC), in keeping with its role as the center for systems management education within the DoD and cooperating with the Harvard Graduate School of Business, provided the means for conducting this fellowship. The fellowship program included the 12-week resident Program for Management Development (PMD) course at Harvard University in Boston, Massachusetts.

Our report topic for this year is modifications and upgrades. As the replacement cycle for weapon systems grows and the turn-over in technology shortens, one answer to maintaining an effective weapon system is through modifications or upgrades. This report will provide you a concise top level review of the DoD regulations, policies and guidance pertaining to major weapon system's Modification and Upgrades. Since modification and upgrades are normally handled at the Service level, we offer a review of each Service's policies and procedures. The report was not constrained to the DoD only; we studied the modification and upgrade procedures for industry, other countries and one other government agency in an effort to provide an insight into how others perform this process. This report is a snapshot in time; it only addresses the guidance and policies effective as of 1 March 1995.

We could not undertake a study of this magnitude without the help, cooperation and contributions of many people. The faculty and staff at Harvard University and DSMC were extremely helpful with their encouragement, insight and support. A number of people have been particularly helpful. Dr. James Price, Dean for Research, Consulting and Information Division at DSMC, served as our mentor providing helpful advice and guidance throughout the research effort. Special thanks to LtCol Charles L. Houston, a former member of the DSMC faculty, for his valuable insights into the acquisition processes used by our allies. We owe our gratitude to the DSMC librarians for their outstanding support throughout our effort.

This report would not have been possible without a few key players outside the DSMC. We conducted more than 50 interviews with key personnel from academia, government, industry and allied nations involved in the modification and upgrade process. All our interviews were conducted in a non-attribution environment. Therefore, we can not thank these key people by name but they have our special thanks.

The Research Fellows extend a special note of thanks to Ms. Joan Sable, DSMC Military Research Fellowship Coordinator. Ms. Sable's efforts were invaluable to the project. She

ensured we received adequate administration support at Harvard and DSMC. She was instrumental in coordinating the reviews of our report. She knew where the “show-stoppers” were and kept us and the project on track and on schedule. Ms. Sable was tireless in her efforts to ensure that we were free to concentrate our efforts toward providing a product that is useful and meaningful to the reader.

There are many others that deserve recognition but in fairness to all, there are too many to mention. The three fellows would like to thank all of those people that helped make this report possible. We hope this report is as helpful to you as you were to us—thank you.

# EXECUTIVE SUMMARY

Since the end of the cold war, there has been an increased emphasis on acquisition reform. This is due, in part, to the fact that the defense budget is getting smaller. With readiness as the priority, there are fewer dollars available for procurement. In an attempt to maintain a viable fighting force, the Services are initiating fewer new programs and are looking to modifications and upgrades as a method to take the Armed Forces into the twenty-first century.

With technology advances being made in just a few years, the DoD needs to continue to insert new technologies and improvements into existing weapon systems and platforms. What this report attempts to capture is the execution of the existing modification or upgrade process used by the Services. To that end, three chapters are dedicated to covering a different service department's process, both in acquiring the modification or upgrade and implementing the change to the affected system.

In an attempt to identify better ideas for the modification and upgrade process, the report looks at the National Aeronautics and Space Administration (NASA), Germany and the United Kingdom (UK). NASA probably has the smallest oversight bureaucracy, within the agency itself. However, there is still considerable oversight from Congress. The modification and upgrade processes for Germany and the UK have several points in common. They tend to lock the design early in the process and limit changes to safety related items only. Both procurement systems have clear separation of the buying community and their users. The user agrees on the requirements and turns them over to the buying organization for execution of the procurement. Change requirements, after weapon system fielding, are returned to the beginning of the acquisition process for review. The early agreement on the requirement and the separation of user and buyer assure both nations maximize their limited defense funds.

In addition, a chapter is devoted to a comparison between the government procurement process and that of commercial industry. This chapter is based on work done previously by DSMC Military Research Fellows and our experience at Harvard Business School.

During our research, some remarkable discoveries were made about the DoD. For example, the number of Office of the Secretary of Defense (OSD) personnel in the acquisition arena exceed the total number of acquisition staff personnel from all the services combined. This is a less than optimal pyramid. There are too many people who can delay a program without adding any value to the oversight process.

During the interview process, we discussed, with high level DoD acquisition community leadership, some specific proposals that could improve the acquisition process. Subsequent to the writing of this report, Dr. Paul Kaminski, USD(A&T), promulgated reforms to the

acquisition process that included some of the points pursued in this report. The deletion of Milestone IV directly impacts this work (see Appendix B). However, there is more to this report than a reaffirmation of the “old” Milestone IV acquisition process. Significantly, the report looks at how the Services effect these changes, the problems encountered and some initiatives for improvement.