ACQUISITION PROGRAM RISK MANAGEMENT: DOES THE DEPARTMENT OF DEFENSE RISK MANAGEMENT PRACTICES GUIDE PROVIDE AN EFFECTIVE RISK TOOL FOR PROGRAM MANAGERS IN TODAY'S ACQUISITION ENVIRONMENT?

SSCF RESEARCH REPORT

May 2012

Robert C. Lyons
Senior Service College Fellowship

Project Adviser:
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ABSTRACT

Acquisition program risk management is a required work activity throughout an acquisition programs life cycle. A program manager (PM), in today's acquisition environment, must continually assess program risk to manage program uncertainty. Risk management assists PMs in defining if they can meet cost (can the product or service be delivered with available funding resources), schedule (can the product or service be delivered in time), and performance requirements (whether the product or service will be able to meet mission-essential requirements). Tools for effective program risk management are widely available in the United States commercial sector. The Department of Defense (DoD) has developed and published a *Risk Management Guide for DoD Acquisition* (hereafter referred to as the Guide). The Guide provides a tool for PMs to assess risk and present findings to senior-level leaders in the DoD acquisition community.

The purpose of this research is to address the following questions:

- Does the Guide provide an effective tool in managing program risk in today's acquisition environment?

- Can the Guide be improved?

The Strategy Research Project consists of the review of the Guide and risk management documentation and articles from multiple Internet sources. The Guide is presented and reviewed to provide the reader of this report with a general understanding of DoD risk management practices. Risk management documentation and articles provide an understanding of the effectiveness and usefulness of risk management practices.

This study also includes a survey to understand risk management practices currently in use by the DoD acquisition community. The survey is aligned to gather data on knowledge and relevance of the Guide, respondent demographics, and other risk management tools now used by the acquisition community.

DoD acquisition career field employees are the target population for this study. The study is cross-sectional and aimed at collecting and analyzing data one time for this population. The results and conclusions of this study are: The study identified the Guide provides a basic tool for risk management, and the Guide is accepted by government acquisition personnel. The Guide does not provide an effective tool for managing the wide variety of projects ongoing in the DoD

acquisition environment. Many recommended improvements to the Guide were identified through this research.

CHAPTER 1
INTRODUCTION AND RATIONAL

Introduction

Acquisition program risk management is a required work activity throughout an acquisition program's life cycle. A program manager (PM), in today's acquisition environment, must continually assess program risk to manage program uncertainty. Risk management assists a program (funding resources), schedule (can the product or service be delivered in time), and performance requirements (whether the product or service will be able to meet mission essential requirements). Risk management is becoming more and more critical to PMs due to dwindling budgets and the need to deliver a product to the Services within acceptable cost. Programs in today's acquisition environment can be canceled readily if they cannot deliver a product that performs as needed by the user within available program dollars. Most Department of Defense (DoD) acquisition programs continually try to develop products that push the edge of technology, require state-of-the-art computer processing, have user requirements that require operation in many environmental extremes, and have demanding availability requirements. So development of these DoD state-of-the-art products requires a full understanding of program uncertainties and future risks.

PMs are required to balance technical performance against available funding. In a PM's world, if an effort requires additional time or development activities, additional funding usually will be required. PMs must make hard decisions if additional funding is not available to complete the program. They are required to trade product performance against available funding, and that requires complex decisions due to complex products. However, product performance in all programs has a baseline and in DoD the baseline is defined as key performance parameters (KPPs). All programs must meet the KPPs, or the product may not be usable in the intended environment, and that could lead to cancellation of the program.

PMs must fully understand program uncertainties due to the complexity of DoD acquisition programs and today's acquisition environment. Doing this requires a full understanding of the program and future issues that may develop. This can be a difficult balancing act that requires full analysis of the product and a projection of future program uncertainties.

Tools for this balancing act and effective program risk management are widely available in the United States commercial sector. The DoD also has developed and published a *Risk Management Guide for DoD Acquisition* (hereafter referred to as the Guide) programs. The Guide provides a tool for PMs to assess program risk and present findings to senior-level leaders in the DoD acquisition community.

Background of the Study

The Guide provides acquisition personnel a basic guide for the assessment and presentation of program risks. The Guide provides a process for risk management, key activities for risk identification, analysis and mitigation, and information on risk planning and preparation activities for risk management.

The Guide is the DoD effort to establish a baseline for the management and reporting of program risk. Overall, the Guide presents a risk management matrix that projects program risk based on levels of likelihood and consequence criteria.

The Guide and management matrix are used by many DoD acquisition programs and presented at many meetings to senior-level leaders as the tool for risk management. The matrix along with rating criteria is accepted by most of the DoD acquisition community. Many individuals believe the Guide is rock-solid for risk planning and presentation. However, the risk management activities included in the Guide have come into question because risk assessment activities are considered a best-guess activity with little validity.

Over past years, during multiple meetings and program reviews, risk reporting in accordance with the Guide has been questioned by many individuals at meetings or program reviews. Questions concerning the applicability, reliability, and accuracy of the data presented based on the Guide can sometimes relate to the process for risk management opposed to program-related risks. Additionally, risk management in accordance with the Guide is not fully understood by all DoD organizations and individuals outside of DoD due to the risk matrix presentation. If individuals or organizations do not fully understand the basics of DoD risk management, an understanding of the information presented in the risk matrix can be very confusing for an individual who experiences the information for the first time.

Risk management is critical for program success. Presentation and understanding of program risks by all individuals who have concerns about the program are also critical for

program success. Having the right tool at the right time that allows full definition and understanding of program risk is critical for successful program management.

Problem Statement

The Guide provides acquisition personnel a basic guide for the assessment and presentation of program risks. The Guide provides a process for risk management, key activities for risk identification, analysis and mitigation, and information on risk planning and preparation activities for risk management. DoD acquisition programs encounter issues with cost, schedule, and performance. In some cases, DoD acquisition programs are terminated due to affordability or the lack of meeting key performance requirements. These circumstances indicate:

1. DoD acquisition programs are based on technology that is not ready for incorporation into a military system.
2. User requirements for material solutions are beyond what can be developed in a military system.
3. DoD continually develops material solutions that are high-risk endeavors.
4. Risk management tools are not adequate to effectively manage risk in DoD acquisition programs.
5. DoD acquisition program schedules and budgets are initially over-optimistic.

This research will investigate circumstance No. 4—risk management tools are not adequate to effectively manage risk in DoD acquisition programs.

Purpose of the Study

The purpose of this research is to address the following questions:

*   Does the Guide provide an effective tool in managing program risk in today's acquisition environment?
*   Can the Guide be improved?

Significance of the Study

In today's acquisition environment, risk management is an important aspect of program management. PMs must be able to define program risk and assess the risk in accordance with impacts to program cost, schedule, and performance. If program risk is not assessed and tracked properly, a program can encounter difficulties that may lead to termination. Termination of a program is not a desired outcome for DoD acquisition. All products in the acquisition cycle are

based on military significant need. These needs are intended to provide new equipment, increase mission capability, and above all, save the lives of our service members.

The preparation for, management of, and presentation of, program risk is one of the most important tasks for today's PM. This is true of all acquisition programs regardless of Acquisition Category (ACAT) Levels. PMs must make this activity a must-do to ensure they are able to address future program issues and have a plan for mitigation.

This study is intended to provide insight into how applicable and acceptable the procedures and processes presented in the Guide support today's PMs and the acquisition community.

Research Methodology Overview

This research follows a formal systematic application of a scientific method to study an issue. The scientific process used for this study includes:

- Definition of the issue
- Formulation of the issue hypotheses
- Collection of data
- Analysis of Data
- Statement of information concerning conclusions and confirmation or disconfirmation of the hypotheses.

This study is aligned to applied research and the solution of issues. This study is conducted for the purpose of evaluating ongoing instructions for DoD acquisition program risk management. This study follows the descriptive research method. A review of available applicable data and a survey to address the research question and research hypothesis is included. The study is designed to measure the effectiveness of current policy in relation to risk management.

DoD employees in the acquisition career field are the target population for this study. The study is cross-sectional and aimed at collecting and analyzing data one time for this population.

Research Questions

The purpose of this research is to assess if the Guide provides an adequate resource for PMs to identify, assess, mitigate, and present associated program risk. Two research questions are defined to develop an understanding of the Guide application in the current DoD acquisition environment. These questions are:

- Does the Guide provide an effective tool in managing program risk in today's acquisition environment?

- Can the Guide be improved?

Research Hypothesis

Two hypotheses for this research are:

- H1: The Guide process and procedures does not provide an effective tool in managing program risk in today's acquisition environment.

- H2: Suggested improvement to the Guide need to be implemented.

Research Limitations

Industry and DoD risk management topics are widely available on most Internet search engines. Initial search results indicate there are more than 12.9 million articles relating to DoD risk management. For industry, the numbers of Internet hits are staggering. Initial results indicate there are more than 42 million articles for risk management. However, most of the articles for both the DoD and Industry are oriented to the discussion and application of risk management. Very few are related to the assessment of how well the risk management practices help or hinder effective program management. This study is limited to articles that discuss the benefits or detriments of the Guide.

Research Questionnaire

The research questionnaire is the heart and soul of this research project. The survey is designed to get a pulse of the current acquisition community's feel about the applicability and effectiveness of the Guide. Considering there are hundreds of thousands of individuals working the acquisition of programs, there is a limit to how many individual surveys can be analyzed. The survey is designed to accommodate input from many acquisition community members across functional fields but represents only a select sample of all involved with the acquisition of products for the Joint Services.

Definition of Key Terms (DoD, 2006, p. 33)

Consequence: The outcome of a future occurrence expressed qualitatively or quantitatively, being a loss, injury, disadvantage, or gain (DoD, 2006, p. 33).

Future Root Cause: The reason, which, if eliminated or corrected, would prevent a potential consequence from occurring. It is the most basic reason for the presence of a risk (DoD, 2006, p. 33).

Issue: A problem or consequence which has occurred due to the realization of a root cause. A current issue was likely a risk in the past that was ignored or not successfully mitigated (DoD, 2006, p. 33).

Risk: A measure of future uncertainties in achieving program performance goals within defined cost and schedule constraints. It has three components: a future root cause, a likelihood assessed at the present time of that future root cause occurring, and the consequence of that future occurrence (DoD, 2006, p. 33).

Risk Analysis: The activity of examining each identified risk to refine the description of the risk, isolate the cause, and determine the effects, and aid in setting risk mitigation priorities. It refines each risk in terms of its likelihood, its consequence, and relationship to other risk areas or processes (DoD, 2006, p. 33).

Risk Identification: The activity that examines each element of the program to identify associated future root causes, begin their documentation, and set the stage for their successful management. Risk identification begins as early as possible in successful programs and continues throughout the life of the program (DoD, 2006, p. 33).

Risk Management: An overarching process that encompasses identification, analysis, mitigation planning, mitigation plan implementation, and tracking future root causes and their consequence (DoD, 2006, p. 33).

Risk Management Planning: The activity of developing and documenting an organized, comprehensive, and interactive strategy and methods for identifying and tracking future root causes, developing risk-mitigation plans, performing continuous risk assessments to determine how risks and their root causes have changed, and assigning adequate resources (DoD, 2006, p. 33).

Risk Mitigation Plan Implementation: The activity of executing the risk mitigation plan to ensure successful risk mitigation occurs. It determines what planning, budget, requirements, and contractual changes are needed, provides a coordination vehicle with management and other stakeholders, directs the teams to execute the defined and approved risk mitigation plans, outlines the risk reporting requirements for ongoing monitoring, and documents the change history (DoD, 2006, p. 33).

Risk Mitigation Planning: The activity that identifies, evaluates, and selects options to set risk at acceptable levels given program constraints and objectives. It includes the specifics of

what should be done, when it should be accomplished, who is responsible, and the funding required to implement the risk management plan (DoD, 2006, p. 33).

Risk Tracking: The activity of systematically tracking and evaluating the performance of risk mitigation actions against established metrics throughout the acquisition process and develops further risk mitigation options or executes risk mitigation plans, as appropriate. It feeds information back into other risk management activities of identification, analysis, mitigation planning, and mitigation plan implementation (DoD, 2006, p. 33).

CHAPTER 2
LITERATURE REVIEW

Introduction

The purpose of this study was to determine:

- Does the Guide provide an effective tool in managing program risk in today's acquisition environment?

- Can the Guide be improved?

A literature review through an Internet search process is included to determine if information is available to address the following questions:

- Are there available data that discusses the implementation and use of the instructions provided in the Guide?

- Are there any benefits for the use and implementation of the instructions provided in the Guide?

- Are there any shortcomings for the use and implementation of the instructions provided in the Guide?

- Are there any suggest improvements to the Guide?

Body of the Literature Review

Managing Risk in a Program Office Environment (Sheppard, 2003)

The author of this article provides a great overview of the importance of risk management and how to employ a risk management program. The article follows guidance provided in the Guide. The article provides information on why risk management is hard, how to identify risks, and how to classify and present program risks.

The author states: An effective risk management program can provide program managers with the information they need to make smart decisions in the face of this uncertainty. Although the techniques for risk management are well documented and not technically difficult, a variety of factors make them hard to implement effectively (Sheppard, 2003, p. 125).

Three things make effective risk management hard:

1. It seldom seems urgent. It deals—or should deal—with events far enough in the future that there is sufficient time to influence the situation or develop alternatives.

Unfortunately, less important daily pressures often get more attention (Sheppard, 2003, p. 125).

2. It does require careful thought. People have to understand the distinction between risks, which have a degree of uncertainty associated with them, and issues, which are realities to be managed. The devil is in the details, and these details must be clearly communicated to isolate the uncertainty and understand its impact. Understanding the true situation will allow teams to focus on solving the right problem and develop far more effective mitigation plans (Sheppard, 2003, p. 125).

3. It requires common understanding and commitment from everyone on the team. This means risk management must be part of the organizational culture, with strong support from senior management and informed participation by the entire team. Creating that common vision and institutionalizing the processes takes training, an investment in resources, and occasional reinforcement (Sheppard, 2003, p. 126).

One of the difficulties with the risk management process as defined by the author is classification of risk and allocation of resources to mitigate program risks. The article states a nominal classification of low, medium, or high may be useful for a snapshot of risk status on a program, but it does not provide enough information to allocate resources. Placing risks in a risk matrix based on the assessment of probability and impact shows their relative importance (ordinal ranking), but this still does not quantify the dollarized impact to the program or justify a level of risk funding to fully understand the risk exposure of a program, the cost of both the impact, and the mitigation options needs to be assessed. However, these assessments cost time and money and should be reserved for those risks with the greatest perceived combination of probability and impact (Sheppard, 2003, p. 132).

The article provides pointers to a PM for an effective risk management program. The author states: The risk manager should establish the process, provide training for the team, make it easy to nominate risks, help the team distinguish between risks and issues, and have someone keep records of progress and status (Sheppard, 2003, p. 135).

Understanding Risk Management in the DoD (Bolles, 2003)

The intent of this article is to show the linkages between risk management and contract administration. The author does identify risk management is mandatory for major acquisition programs.

The article states:

Although the Department of Defense's (DoD's) current risk management direction presents a comprehensive and robust approach to identifying, assessing, and managing risk, it does not adequately emphasize the interface between risk management and contract administration.

In essence, a well-crafted, risk-appropriate contract can temper the sensitivity between technical risk and the probability of cost and schedule overruns, while a poorly crafted contract can actually increase the probability of cost and schedule overruns.

By better linking sound risk management practices with sound contract administration practices, the DoD stands to continue being the bellwether federal agency for pushing the state-of-the-art in effective risk management. There is no dispute that there is a strong relationship between technical risk and cost and schedule overruns, nor is there any dispute that DoD Project Offices must assess and mitigate technical risk if they are to be successful. However, what must be kept in mind is that technical risk in and of itself does not directly result in cost and schedule overruns.

The moderating variable is the manner in which a project's contract is crafted and how deftly the contract is administered, given the nature of a project's technical risk. In essence, a well-crafted, risk-appropriate contract can temper the sensitivity between technical risk and the probability of cost and schedule overruns, while a poorly crafted contract can actually increase the probability of cost and schedule overruns (Bolles, 2003, pg 141).

The article defines three key areas where DoD guidance is lacking information on the relationship between risk management and contract management:

1. The DoD guidance offers little specificity in relating the nature of technical risk and the appropriateness of one contract type over another. For example, although the Defense Acquisition University's (DAU) *Risk Management Guide for DoD Acquisition* states that "the government contracting officer should select the proper type of contract based on an appropriate risk assessment, to ensure a clear relationship between the selected contract type and program risk" (p. 32), this guidance is not particularly prescriptive in assisting a Project Office in choosing the most appropriate contract type vis-a-vis the results of a risk assessment (Bolles, 2003, p. 143).

2. The DoD guidance does not discuss the relationship between contractor and government risk sharing arrangements and the key Federal Acquisition Regulation (FAR) clauses typically invoked in a contract (Bolles, 2003, p. 144).

3. The DoD guidance only addresses only risk management in the context of major weapon systems and Automated Information Systems (AIS) acquisitions. However, the Office of Management and Budget Circular, which is the governing document for implementing risk management in the federal government, is applicable to all major capital asset acquisitions, including Military Construction (MILCON) projects and environmental restoration (ER) projects. As such, risk management should be as much a component of planning for and managing MILCON and ER projects as it is for weapon systems and AIS projects (Bolles, 2003, p. 144).

In conclusion, the author provides four critical perspectives for improving the ties between risk and contract management. Risk management is an extremely powerful component of the DoD's approach to procuring major capital systems. However, the current DoD direction could be improved if it were to incorporate a more robust discussion of the nexus between risk management and contract administration. Although not intended to be the final word on this issue, this article represents an attempt to raise DoD Project Office awareness in understanding this critical yet misunderstood issue. To recap, DoD Project Offices would be well served to:

1) Use the results from their pre-acquisition risk analysis to choose an appropriate contract vehicle vis-a-vis the nature of the risk identified in the analysis

2) Adopt sound risk management practices for all major acquisition projects, including MILCON and ER

3) Ensure that the FAR clauses invoked in a contract are congruent with the risk sharing arrangement agreed to by the parties

4) And ensure that the Contracting Officer is included as a key member of a Project Office's risk management team (Bolles 2003, p. 151)

Some Considerations for Implementing Risk Management in Defense Programs (Conrow & Fredrickson, 1996).

However dated, this article still provides great insight into the DoD risk management practices and Guide. The article focus is on suggested considerations when implementing a risk

management program. Many deficiencies are identified that must be considered in risk management practices.

Key points of the article include:

- The risk management process is often weakly structured or "ad hoc" for both the government and contractors. There may be no clearly delineated mechanism in place for managing program risk (e.g., organizational responsibilities, analyses, products, etc.), or if a risk management process exists, it may be present on paper only. The risk assessment portion of the risk management process is often too subjective and not adequately documented.

- The prescribed risk assessment categories may be overly broad (e.g., management, technical), leading to difficulty in evaluating results and implementing a viable, measurable risk mitigation strategy.

- A weak risk assessment methodology may be used, which introduces considerable doubt as to the accuracy and value of the results for senior management use.

- Ordinal risk assessment scales are often incorrectly applied. Mathematical operations cannot be applied to scores obtained from uncalibrated ordinal risk assessment scales. Risk values generated by mathematical operations are generally meaningless and may hide true risk issues.

- The risk assessment results may be summarized into broad categories (e.g., low, medium, and high) without sufficient backup to understand the nature of the risk present.

- The government and contractors may use different, incompatible risk assessment methodologies making comparing results difficult, if not impossible. The emphasis of the risk assessment process is generally on the uncertainty associated with a specific event occurring, with less attention given to the consequence of the event occurring. Risk is often inaccurately referenced as only the uncertainty term. However, it is the product of the uncertainty and consequence terms that yields risk. In addition, both the uncertainty and consequence terms require evaluation and tracking over time. Program risk assessments and mitigation plans are often unlinked. In addition, they may be prepared on an as-needed basis with limited tracking against key program milestones (Conrow & Fredrickson, 1996, pp. 6-11).

Embracing Uncertainty in DoD Acquisition (Frick, 2010)

The author of this article presents assumptions and improvements about risk management beyond other author's recommendations. The author presents a case that risk management should also be concerned with the positive side of risk management and the Guide should provide information to prepare for good circumstances that can benefit the program. The article states: Uncertainty is an inherent, unavoidable aspect of life that has a significant impact on program or project management, and acquisition in general. The treatment of risk management within the DoD as a formal element of acquisition is a topic discussed extensively in the acquisition profession. DoD fares no better than industry in the number of projects or programs that fail to meet cost, schedule, or performance baselines. This article suggests that, overall, the DoD approach to uncertainty is flawed, and that we need substantive changes to the structure and policies of acquisition to become more effective in the discipline of program management.

The Guide defines risk as "a measure of uncertainties in achieving program performance goals and objectives within defined cost, schedule, and performance constraints." However, it in no way implies the potential positive aspects of these uncertainties. The terms used, e.g., "schedule slip, budget increase, cannot meet key program milestones" concentrate only on the negative aspects of uncertainty. This is not surprising. The Guide specifically states, "While such variation could include positive as well as negative effects, this guide will only address negative future effects. Most of us tend to think of risk solely in terms of negative consequences. Few academicians or organizations even address the positive potential of uncertainty" (Frick, 2010, p. 355).

The author also believes a risk management funding reserve should be permitted to support the PM with an actionable plan to reduce risk. The author states: Both control and avoidance assume that most of the pitfalls that lead to potentially increased risks have been identified. Plans are developed to identify trigger events and react to these events (control), or actions are taken to reduce the number of items (avoidance) on the list. In contrast, no list of risk events or risk triggers will be comprehensive. There always will be an undefined and unknowable spectrum of unpleasant things that can happen. Neither of these approaches (control, avoidance) addresses this fact. Assumption covers this domain of the unknowable—although the Guide does not acknowledge this purpose.

In practice, assumption of both the known and unknown most often are disingenuous pronouncements. While the concept of a management reserve is a well-established practice in industry, I have yet to meet a single government PM whose reserve survived the gauntlet of program reviews, sweep ups, agency taxes, or end-of-year "unfunded requirements." In reality, management reserves seldom exist formally, and, if they do, seldom survive, particularly when fiscal boundaries are relevant. Unfortunate events result in schedule slips, cost overruns, or performance reductions. In practice, baselines are adjusted to comport with reality, or the number of "required" units shrinks to meet current resources (Frick, 2010, p. 363).

Book review. Effective Risk Management: Some Keys to Success, 2nd Edition

Author: Edmund H. Conrow (Wideman, 2003)

The author of this book review completed a group study of *Effective Risk Management: Some Keys to Success*, Second Edition. The intent of the study was to present information on an author who had considerable experience with the development of the *DoD Risk Management Guide*. The book review provides a number of quotable statements that demonstrate the authors' experience and orientation to program risk management:

"One of the key implementation issues that must be addressed is how to overcome a corporate culture that is lacking or even negative toward risk management."

"I would also be remiss if I did not say that risk management can be *very political* in some programs."

"I have also found that the overall effectiveness of a risk management process is primarily determined by two factors, namely, technical sophistication and implementation efficiency."

"Although risk avoidance may sometimes be the best risk handling approach, program managers should not expect miracles to occur on demand to resolve risk-related issues that should have been properly dealt with much earlier" (Wideman, 2003, p. 3).

Risk Management Considerations for Interoperable Acquisition (Meyers, 2006)

The author of this technical note broadens the requirement of program risk management. The focus of the article is on interoperable acquisition, which includes the set of practices that enable acquisition, development, and operational organizations to collaborate more effectively to field interoperable systems. These practices are achieved through sharing relevant information

and performing necessary activities that enable the collective behavior of these organizations to successfully deliver systems-of-systems capabilities (Meyers, 2006, p. 1).

The author discusses systems of systems acquisition with interoperability requirements. The author compares DoD and industry risk management guides to interoperability risk requirements. Findings indicate information provided permits risk management of stovepipe acquisition programs and does not address overall system of system interoperability requirements. Findings of the report state:

- The current specifications related to risk management are insufficient to achieve interoperable risk management. For example, as we have seen, there are concepts that are:

  – insufficiently specified (e.g., the relation between qualitative and quantitative values of probability)

  – unstated (e.g., the identifier of a risk or its state) (Meyers, 2006, p. 23).

- Our experience indicates current methodologies for the practice of risk management are insufficient to achieve interoperable risk management. Existing practices encapsulate behaviors that are performed with regard to risk management. However, the specifications of such practices do not address:

  – Data management and sharing of risk-related data

  – Behaviors performed in a collective manner, including the decision-making process (Meyers, 2006, p. 23).

Conclusions of the Literature Review

Industry and DoD risk management topics are widely available on most Internet search engines. Initial search results indicate there are more than 12.9 million articles relating to DoD risk management. For industry, the numbers of Internet hits are staggering. Initial results indicate there are more than 42 million articles for risk management. However, most of the articles for both the DoD and industry are oriented to the discussion and application of risk management. Very few are related to the assessment of how well the risk management practices help or hinder effective program management. This study is limited to a few articles that discuss the benefits or detriments of the Guide.

The intent of the literature review was to determine:

- Are there available data that discusses the implementation and use of the instructions provided in the Guide?

- Are there any benefits for using and implementing the instructions in the Guide?

- Are there any shortcomings for the use and implementation of the instructions provided in the Guide?

- Are there any suggested improvements to the Guide?

These answers to these four questions are as follows:

Are there available data that discusses the implementation and use of the instructions provided in the Guide?

Data that discusses the implementation and use of the instructions provided in the Guide is not identified in the literature review. Many topics that discussed the Guide are included, but specific information in relation to implementation in a program environment is not available.

Are there any benefits for the using and implementing the instructions provided in the Guide?

The Guide is a great basic source of instruction for instituting a risk management program in today's acquisition environment. The Guide is considered one of the DoD and industry standards for an effective risk management program. The Guide does provide basic step-by-step instructions for risk management.

Are there any shortcomings for the use and implementation of the instructions provided in the Guide?

There is no information identified that described shortcomings of the information provided in the Guide. All information reviewed indicated acceptance of the data presented in the Guide. However, a number of suggested improvements were identified.

Are there any suggest improvements to the Guide?

- Nominal risk classification of low, medium, or high may be useful for a snapshot of risk status on a program, but it does not provide enough information to allocate resources. (Sheppard, 2003, p. 132). The current Guide needs improvement for risk classification. Information on allocation of resources and program consequences based on risk would benefit PMs.

- The current Guide could be improved if it were to incorporate a more robust discussion of the nexus between risk management and contract administration (Bolles 2003, p. 141).

- The current Guide could be improved if a discussion of the relationship between contractor and government risk sharing was included (Bolles, 2003, p. 144).

- The current Guide could be improved if it incorporated a discussion on the tie between government and contractor risk reporting methods (e.g., organizational responsibilities, analyses, products, etc.) (Conrow & Fredrickson, 1996, pp. 6-11).

- The current Guide could be improved by incorporating a discussion on the positive side of risk management. The Guide should provide information to prepare for good circumstances that can benefit the program (Frick, 2010, p. 355).

- The current Guide could be improved if it were to incorporate a discussion on interoperable risk management (Meyers, 2006, p. 23).

CHAPTER 3
METHODS

Introduction

This chapter describes the research perspective, research design, and research questions and hypotheses. Information concerning participation, population, and sample, unit of analysis, research instrument, pilot study, data collection procedures, data collection and statistical analysis, bias and error, survey validity and reliability are presented in this chapter. This research follows a formal systematic application of a scientific method to study an issue. This study is aligned to applied research and the solution of issues. This study is conducted to evaluate ongoing instructions for DoD acquisition program risk management. This study follows the descriptive research method. A review of available applicable data and a survey are included to address the research question and research hypothesis. The study is designed to measure the effectiveness of current policy in relation to risk management.

Research Perspective

All data collected in this study are designed to collect both qualitative and quantitative data for assessment of the Guide and procedures. The main purpose of this study is to gain knowledge on current use, applicability, acceptability, and suggested improvements to the Guide. Members throughout the acquisition community and serving in different functional areas are selected to ensure input is acquired from as many perspectives as possible. This type of information and study input is intended to gain a slice of information from the broad acquisition community.

Research Design

This research includes three components. The first component includes a full review and presentation of the Guide to ensure readers of this study understood the process and procedures defined by the Guide. The Guide Review is included as Appendix A. The second component includes a review of applicable literature to understand if other sources have information on the relevance and acceptability of the instructions included in the Guide. The third component of the study is designed to gain information on the current use, applicability, acceptability, and suggested improvements to the Guide from acquisition personnel through a survey.

This three-component design is pursued to gain information on the acceptance of the process and procedures portrayed by the Guide.

Research Questions and Hypothesis

Research Questions:

The purpose of this research is to assess if the Guide provides an adequate resource for PMs to identify, assess, mitigate, and present associated program risk. Two research questions are defined to develop an understanding of the Guide application in the current DoD acquisition environment. These questions are:

- Does the Guide provide an effective tool in managing program risk in today's acquisition environment?

- Can the Guide be improved?

Research Hypothesis:

Two hypotheses for this research are:

- H1: The Guide process and procedures do not provide an effective tool in managing program risk in today's acquisition environment.

- H2: Suggested improvement to the Guide need to be implemented.

These questions are aligned to address the intent of the study: Overall, do the Guide and instructions in the Guide provide a good tool for risk management, or are there any improvements that can be implemented to benefit the DoD?

Participation, Population, and Sample Size

Participation

Participation in this study was fully voluntary by all acquisition personnel. Acquisition personnel were selected from multiple sources. Individuals were not selected based on expected response or position. The information provided was not designed to instruct an individual on how to respond to the survey questions.

Population

Two select groups were chosen for the survey. The first group included individuals from the author's 30-year DoD acquisition experience. All these individuals were not selected based on experience or knowledge of the DoD risk management practices. All individuals from this group were selected randomly from among acquisition personnel ranging from the very experienced to new members of the workforce community. The second group selected was from current and past participants in the DAU's Senior Service College Fellowship. These individuals, even though in senior acquisition positions, were selected based on the wide organizational input

need of the study. The study was to have a dispersed response to the survey by individuals in many functional areas. Target Functional areas were: Program Management, Contracting, Information Technology, Life Cycle Logistics, Production, Quality and Manufacturing, Systems Planning, Research, Planning and Engineering, Test and Evaluation, and Requirements Management.

Sample Size

- First Group: 106
- Second Group: 16

Unit of Analysis

The unit of analysis for this study is a small sample of DoD acquisition personnel. All individuals and organizations could not be sampled due to the sheer size of the acquisition community. Select members from multiple organizations are included from two populations. The first population included individuals from the author's 30 years of experience in DoD acquisition and the second population included personnel from DAU's Senior Service College Fellowship program.

Research Instrument

The Guide survey includes two parts. The first part was aligned to gain demographic information from all participants. This part consists of seven questions. Demographic information collected includes information on the participant's current employer, acquisition functional area, employment type and pay grade, acquisition certification level, years employed in current position, years employed in the DoD, and ACAT Level programs. The survey demographic questions were designed to ensure participants could not be identified based on their response.

The second part of the survey was designed to ask specific questions relevant to the Guide. This part consisted of 21 questions. A complete review of the Guide was included in this study for survey question development. The review was aimed at identifying specific questions to allow participant feedback on the Guide and suggested improvements. The Guide review is included as Appendix A. Questions 1 through 5 of the survey were designed to gain participant knowledge on the Guide and use of the Guide by the Program Office or Risk Management IPT. Questions 6 and 7 were designed to understand how participants define and track risks for their program. Questions 8 through 10 were designed to gain information on the acquisition life cycle

stage of the participants' programs and how program risks are updated and tracked. Questions 11 through 15 were designed to gain participant assessment of the Risk Management Reporting Matrix. Questions 16 and 17 were designed to arrive at an understanding if root cause and work breakdown structure risk identification were used by the participants for their programs. Question 18 and 19 were designed to determine if the participants' programs have a risk management and risk mitigation plan and if the plan is in accordance with the Guide. Question 20 was designed to gain participants' assessments on whether the Guide is a useful tool for timely and accurate decisions. Questions 21 was designed to understand if the participants use other risk management tools and if they had any other suggested improvements to the Guide.

The methods for survey question development for the first part of the survey were based on authors' knowledge of demographic information relevant to the research and the acquisition community. The methods for survey question development for the second part of the survey were based on the review of the Guide for risk management concepts and processes.

Pilot Study

A pilot study on the research instrument was included in this research. The survey was reviewed by a project advisor for clarity, content, and validity. Additionally, a select group of individuals who are very familiar with risk management practices reviewed the survey for clarity, content, and validity. Their recommendations and comments were included in the survey. All comments were administrative and clarifying in nature. New questions or removal of questions were not recommended.

Data Collection Procedures

The survey instrument for this research is an Internet tool titled SurveyMonkey. SurveyMonkey provides a great tool for assembling a survey from multiple participants. The risk management survey for this study was targeted for 122 respondents. SurveyMonkey provided the ability to collect and analyze data based on the survey. The survey was sent to all participants and remained open for 3 weeks. One reminder to fill out the survey was sent at the start of the third week of the survey to ensure all individuals had a chance to participate.

Data Collection and Statistical Analysis

The data were collected in this study from responses from all individuals surveyed. SurveyMonkey provides consolidation of the results from the survey. The program includes a data analysis section that can present data in table or figure formats. Data for this research are

more easily presented in table format due to design of the questions from the survey. Many questions included the option to provide written response to the question. These responses were collected by SurveyMonkey and presented as a list of comments. Many of the relevant comments are presented in this research. Basic statistical analysis of the responses are tabulated and presented to provide information on the Guide. Tables in this research from SurveyMonkey include three basic types to include yes/no table, list selection table, and level of use or knowledge table. Table 1 provides an example of the yes/no table. These tables present information on answer selected, response percentage, and response count. Table 2 provides an example of the list selection table. These tables present information on answer selected, response percentage, and response count. Table 3 provides an example of level of use or knowledge table. This type of table allows the participant to select a level of knowledge or use from no knowledge or use to full knowledge or use in a scale from one to seven selections. The table provides information on the participant's selection on the one-to-seven scale, rating average and response count.

Answer Options	Response Percent	Response Count
Yes	88.1%	52
No	11.9%	7

Table 1. Yes/No Table Example

Answer Options	Response Percent	Response Count
1-5 years	52.5%	42
6-7 years	23.8%	19
8-10 years	2.5%	2
11-15 years	7.5%	6
15+ years	13.8%	11

Table 2. List Selection Table

Answer Options	Does not provide			Provides Minimal Portrayal			Fully Portrays Program Risk	Rating Average	Response Count
DoD Risk Management Guide	2	2	1	10	24	17	0	4.84	56

Table 3. Level of Use or Knowledge Table

Bias and Error

Only a small sampling of the entire DoD acquisition community was included in this research. Many organizations and personnel who may have a different interpretation of the Guide are not included. If the entire DoD acquisition community could be surveyed, different results might be found. All survey participants provided input voluntarily, and questions were designed for ease of answer based on knowledge and use of the Guide. Levels of knowledge and use tables were designed subjectively. Participant's responses to seven different selections can be based on personality, program acquisition category, or good or bad experience with the Guide. Results of the survey are not handled in a positive or negative way. All results are reported based on participants' responses. Control of bias and error in future research may be controlled through interviews in which the researcher can ask additional clarifying questions.

Survey Validity and Reliability

This study only involves a small group of the acquisition community. All members of the Joint Service acquisition community are not surveyed due to the sheer number of expected input. Acquisition community members are selected from an appropriate sample of individuals in acquisition positions and different functional areas. This approach provides a great first step in assessing if the Guide is applicable and acceptable.

Survey validity and reliability are expected to be high due to the basic general nature of the questions developed for the survey. The survey research and the responses provided are considered valid and reliable due to direct correlation to the information provided in the Guide.

Summary

In summary, the methods used for this research included a literature review and a survey to address the research questions and hypothesis. The study included a review of the Guide for development of all questions in the survey. The overall intent of the research was to assess if the Guide and practice provides a good tool for the PM in today's acquisition environment.

SurveyMonkey was used as the survey instrument for survey, data collection, and data analysis. The survey was sent to 122 individuals in the DoD acquisition community. The survey included seven demographic questions and 21 questions aligned to collect information on the Guide.

CHAPTER 4
RESULTS

Introduction

Chapter 4 presents and discusses the results of DoD Risk Management Survey. The Chapter is divided into two sections. The first section provides information collected through the survey on participant's demographic information. The second section provides participants responses to the Guide survey questions and relative comments.

Survey Results

Section 1: Participant's Demographic Information:

Question 1: Current employer:

Eighty participants responded they were employed with the United States Army.

Question 2: What is your Acquisition Functional Area?

Seventy-nine participants responded to this question. Table 4 provides a response breakout by acquisition functional area.

Answer Options	Response Percent	Response Count
Business, Cost Estimating, and Financial Management	1.3%	1
Contracting	6.3%	5
Purchasing	0.0%	0
Facilities Engineering	0.0%	0
Industrial Property	0.0%	0
Information Technology	0.0%	0
Life Cycle Logistics	2.5%	2
Program Management	41.8%	33
Production, Quality, and Manufacturing	1.3%	1
Systems Planning, Research, Development and Engineering	31.6%	25
Test and Evaluation	13.9%	11
Requirements Management	1.3%	1
International	0.0%	0

Table 4. Participants Acquisition Functional Area

Question 3: What is your employment Type and Pay Grade?

Seventy-eight participants responded to this question. Table 5 provides a response breakout by employment type and pay grade.

Military Answer Options	O-10	O-9	O-8	O-7	O-6	O-5	O-4
Pay Grade	0	0	0	0	0	3	1

Civilian Answer Options	SES	GS-15/ equivalent	GS-14/ equivalent	GS-13/ equivalent	GS-12/ equivalent	GS-11/ equivalent	GS-10/ equivalent
Pay Grade	1	23	20	23	4	2	1

Table 5. Participants Employment Type and Pay Grade

Question 4: What level of Acquisition Certification have you achieved in your career?

Eighty participants responded to this question. Table 6 provides a response breakout by acquisition certification levels.

Answer Options	Response Percent	Response Count
Level I	3.8%	3
Level II	8.8%	7
Level III	87.5%	70

Table 6. Participants Acquisition Certification Levels

Question 5: How long have you been employed in your current position?

Eighty participants responded to this question. Table 7 provides a response breakout by years in current position.

Answer Options	Response Percent	Response Count
1-5 years	52.5%	42
6-7 years	23.8%	19
8-10 years	2.5%	2
11-15 years	7.5%	6
15+ years	13.8%	11

Table 7. Participants Years in Current Position

Question 6: How long have you been employed in the Department of Defense?

Eighty participants responded to this question. Table 8 provides a response breakout by years of service in the DoD.

Answer Options	Response Percent	Response Count
1-5 years	10.0%	8
6-7 years	7.5%	6
8-10 years	5.0%	4
11-15 years	10.0%	8
15+ years	67.5%	54

Table 8. Participants Years of Service in the Department of Defense

Question 7: Which Acquisition Category programs have you worked (check all that apply)?

Seventy-two participants responded to this question. Table 9 provides a response breakout by ACAT. Responses to the other category included non program of record efforts. As indicated by the response count, many participants have worked on multiple ACAT level programs.

Answer Options	Response Percent	Response Count
ACAT I	33.3%	24
ACAT II	48.6%	35
ACAT III	73.6%	53
ACAT IV	31.9%	23
Other (please specify)		10

Table 9. Participants ACAT Level Experience

Section 2: Participants Responses to the Guide Survey Questions and Relative Comments

Question 1: Are you familiar with the Guide?

Sixty-eight participants responded to this question. Table 10 provides a response breakout.

Answer Options	Not Familiar			Some What Familiar			Very Familiar	Response Count
DoD Risk Management Guide	11	3	1	18	10	17	8	68

Table 10. Guide Familiarity

Question 2: Do you, your program office, or you in a supporting role to the program office use the DoD Risk Management process provided in the Guide?

Fifty-nine participants responded to this question. Table 11 provides a response breakout.

Answer Options	Response Percent	Response Count
Yes	88.1%	52
No	11.9%	7

Table 11. Participants Use of the Guide

Question 3: Does your Program Office believe Risk Management is the responsibility of the program office or all organizations that are involved in your program?

Fifty-six participants responded to this question. Table 12 provides a response breakout.

Answer Options	Response Percent	Response Count
Program Office	25.0%	14
All Organizations	75.0%	42

Table 12. Risk Management Responsibility

Question 4: Does your Program have a Risk Management IPT?

Fifty-seven participants responded to this question. Table 13 provides a response breakout.

Answer Options	Response Percent	Response Count
Yes	36.8%	21
No	63.2%	36

Table 13. Risk Management IPT

Question 5: If your program has a Risk Management IPT who is on the IPT? (Check all that apply.)

Twenty-one participants responded to this question. Table 14 provides a response breakout. Other category responses did not relate to organization or individuals who support the Risk Management IPT. These responses provided additional information on other answer options.

Answer Options	Response Percent	Response Count
PM	95.5%	21
Logistician	59.1%	13
Tester	63.6%	14
Evaluator	50.0%	11
Requirements Developer	45.5%	10
User	45.5%	10
Contracting (Government)	36.4%	8
Contractor (Product Contractor not program office support contractor)	63.6%	14
Other (please specify)		6

Table 14. Risk Management IPT Membership

Question 6: The Guide: Does your Program Office or Risk Management IPT define program risks as? (Please check all that apply.)

Fifty-three participants responded to this question. Table 15 provides a response breakout. Other category responses related to cost, schedule, and performance risks addressed in the next question.

Answer Options	Response Percent	Response Count
Current Program Issues	69.8%	37
Technology Development Requirement Risks	77.4%	41
Anticipated Root Cause Future Program Risks	69.8%	37
Other (please specify)		5

Table 15. Risk Management Definition

Question 7: Does your Program Office or Risk Management IPT track risks for cost, schedule, or performance? (Please check all that apply.)

Fifty-five participants responded to this question. Table 16 provides a response breakout. Other category responses did not relate to the question.

Answer Options	Response Percent	Response Count
Cost	96.4%	53
Schedule	98.2%	54
Performance	100.0%	55

Table 16. Risk Management Tracking

Question 8: What is the acquisition life cycle stage of your program (please check one)?

Fifty-eight participants responded to this question. Table 17 provides a response breakout. Other category responses indicated the participants are working in an acquisition environment that has programs in multiple stages of the life cycle or are working on non program of record efforts.

Answer Options	Response Percent	Response Count
Material Solution Analysis	6.5%	3
Technology Development	17.4%	8
Engineering and Manufacturing Development	32.6%	15
Production and Deployment	32.6%	15
Operations and Support	10.9%	5
Other (please specify)		12

Table 17. Program Acquisition Life Cycle Stage

Question 9: When does your Program Management Team or Risk Management IPT update program risks (check all that apply)?

Fifty-seven participants responded to this question. Table 18 provides a response breakout. Other category responses indicated program risks are updated continuously.

Answer Options	Response Percent	Response Count
Monthly	44.4%	24
Quarterly	35.2%	19
Semi-annually	14.8%	8
Milestones	24.1%	13
Critical Program Events	44.4%	24
Other (please specify)		3

Table 18. Program Risks Update

Question 10: What risk management tracking tool does your Program Management Team or Risk Management IPT use? (Please check all that apply.):

Sixty participants responded to this question. Table 19 provides a response breakout. Other category responses provided additional information on how the tools are used to present program risks.

Answer Options	Response Percent	Response Count
Excel spreadsheet	45.1%	23
Word document	47.1%	24
PowerPoint Presentation	78.4%	40
Other (please specify)		9

Table 19. Risk Management Tracking Tools

Question 11: Do you believe the Risk Management Reporting Matrix provides an accurate and fair portrayal of program risk based on likelihood and consequence?

Fifty-six participants responded to this question. Table 20 provides a response breakout.

Answer Options	Does not provide			Provides Minimal Portrayal			Fully Portrays Program Risk	Rating Average	Response Count
DoD Risk Management Guide	2	2	1	10	24	17	0	4.84	56

Table 20. Risk Management Matrix Accuracy and Portrayal

Question 12: Do you agree the Guide level of likelihood instruction provides a fair assessment of risk likelihood and probability of occurrence? If not, please explain why and what improvements should be considered.

Fifty-five participants responded to this question. Table 21 provides a response breakout. Five improvement comments were received that directly relate to suggested improvements as follows:

- Current tools need additional space for descriptive texts on likelihood and consequences. Some risks have multiple potential outcomes and need to be described as such.
- The process (colored chart) is too simplified and to open for interpretation. There needs to be a more detailed process for all program areas (financial, technical, operational, etc.).
- All risks charts should include a narrative specifying the rational for the assessment.
- A proper assessment of Program Probability of Success has to have a Monte Carlo analysis and a Risk Managers assessment of the integrated (c,s,p) risk for the probabilities to mean anything. Probabilities of individual risks do not provide the comprehensive view, and give a false picture of what the real risk driver in the program is. Couple the individual risks to an objective analysis such as Monte Carlo.
- The Guide needs to be more clearly defined in the evaluation of the risks.

Answer Options	Does not provide			Provides Minimal Portrayal			Fully Provides Likelihood	Rating Average	Response Count
DoD Risk Management Guide	2	1	0	11	23	18	0	4.93	55
Suggested Improvements									17

Table 21. The Guide Level of Likelihood Instruction

Question 13: Has your Program Office or Risk Management IPT ever modified or customized the level of likelihood for a specific program? If so, please explain:

Sixty-three participants responded to this question. Table 22 provides a response breakout. A review of the modification and customization comments did not provide any substantial or reportable information.

Answer Options	Response Percent	Response Count
Yes	15.9%	10
No	84.1%	53
Modification or Customization		10

Table 22. Level of Likelihood Modification

Question 14: Do you agree the Guide Levels and Type of Consequence Criteria provide a fair assessment of risk consequence? If not, please explain why and improvements that should be considered.

Sixty-one participants responded to this question. Table 23 provides a response breakout. Seven improvement comments were received that directly related to suggested improvements as follows:

- Current tools need additional space for descriptive texts on likelihood and consequences. Some risks have multiple potential outcomes and need to be described as such.

- My issue with the Guide and Risk Management in general is this, you focus on what can and will go wrong instead of what can and will go right. Research has shown that focusing on the negative tends to lead to negative results. It is very deficit on the risk-reward side of things and gets people to look at how to fail rather than how to succeed. I believe there is always a way to succeed. You just have to find it.

- It still leaves to much room for individual interpretation.

- The consequences can vary significantly within a risk area.

- Criterions are too broad and do not look at a comprehensive view of the program. The criteria do not define pre-mitigated or post-mitigated stance. Example: Just because an individual risk consequence says the program breaches APB by 6 months, it does not

necessarily mean that will happen. It depends on the PM's probability and comprehensive risk analysis to the Program, not individual risks.

- The previous editions of the Guide provided casualty and dollar values for applying consequence assessment. This was not an effective way of trying to quantify consequence risk. The newer version gives a scaling percentage depending on the dollar amount of the program—a huge improvement. Still, no two programs are identical and should tailor their thresholds for accepting consequences, depending on the overall risks associated with the program. Also, it can be difficult to balance what the final value should be after balancing cost, schedule, and performance.

- The consequence determination does not reflect how various portions of the acquisition cycle operate. It does not allow proper flexibility to trade cost vs. Schedule, nor does it allow for 80 percent solutions that will be accepted in the end.

Answer Options	Does not provide			Provides Minimal Assessment			Fully Provides Assessment	Rating Average	Response Count
DoD Risk Management Guide	0	2	3	14	26	16	0	4.84	61
Concerns and Suggested Improvements									15

Table 23. The Guide Levels and Type of Consequence Criteria

Question 15: Has your Program Office or Risk Management IPT ever modified or customized the consequence criteria for a specific program? If so, please explain.

Sixty-two participants responded to this question. Table 24 provides a response breakout. Consequence Criteria Modification provided by the participants was not applicable to the question.

Answer Options	Response Percent	Response Count
Yes	16.1%	10
No	83.9%	52
Consequence Criteria Modifications		10

**Table 24. The Guide Consequence Criteria
Modification or Customization**

Question 16: Do you believe the Guide provides sufficient information to understand and assess Root Cause Program Risks? If not, please explain why and improvements that should be considered.

Sixty-two participants responded to this question. Table 25 provides a response breakout. Seven improvement comments were received that directly relate to suggested improvements as follows:

- No, I believe the Guide is focused on determining the severity of the problem. I do not believe it is a tool for determining the root cause. Our program was in the EMD phase and had technology readiness and engineering issues. I am not sure how the Guide could be modified to understand the root causes of these types of issues.

- The risks tools provided do not lend themselves to identifying root causes. They generally describe the potential risks in terms of potential symptoms and remedies. Some program risks for financial and schedule items are political in nature and externally driven. Some are process driven based on interpretation of statutes and regs. Root cause analysis wouldn't help in these situations but would identify the real issues to decision makers and permit the full story.

- It would be nice if the Guide included techniques to perform root cause analysis, such as fishbone diagrams, etc.

- Does not adequately portray advocacy of your program among stakeholders and leaders.

- Does not adequately require an analysis of changes in the strategic environment that may negatively impact the program.

- Root cause analysis really isn't a main focus of the Guide, although it is important because more cursory risks could not be the true source of the problem.

- Without identifying and managing the root cause, the cursory risks may not be manageable. A possible addition to the Guide could be using the Ishikawa fishbone diagram in conjunction with the standard consequence and likelihood assessment. It's a simple method and identifies the risk for likelihood and consequence assessment.

- I think the Guide and the tools available are adequate, but most people need more training in how to actually define a risk and how to figure out the root cause.

Answer Options	Does not provide			Provides Minimal Information			Provides Required Information	Rating Average	Response Count
DoD Risk Management Guide	2	2	3	19	18	17	1	4.68	62
Root Cause Improvements									16

Table 25. Root Cause Program Risks

Question 17: Do you agree the Work Breakdown Structure (WBS) process for risk identification as presented in the Guide is sufficient for Root Cause Analysis and Risk Identification? If not, please explain why and improvements that should be considered.

Fifty-nine participants responded to this question. Table 26 provides a response breakout. Six improvement comments received directly relate to suggested improvements as follows:

- WBS process is one of many tools, but it alone won't identify all risks. It doesn't identify all root causes because they aren't always related to a WBS.

- A good start but not all encompassing.

- The Guide mentions going to a WBS level 4 or 5 element, which in turn, could have several root causes. There should be some distinction in the Guide between different ACAT levels. For example, for programs which I am familiar with, ACAT II-IV, EVMS [Earned Value Management System] is only captured at Level 2 of the WBS. Also, the WBS may lead the IPT or program office to some other factor. The IPT or program office may be better identifying risks through the KPPs, the threshold vs. objective requirements in the Performance Specification, or some other methodology.

- This is the best tool if you could go down the WBS to a very deep level, but this could be labor intensive and not possible to complete for all risks. Overall, the process could cost more than the project and provide no cost savings—one of the goals of risk management. I would consider using a more global approach to identify root causes and identify risks, including an overarching IPT for the project as a whole.

- This depends on the level of the WBS and how well developed the WBS is. There are interdependencies that can be missed by just looking at the WBS.

- Your risk identification is only as good as your WBS. Although this technique can be applied directly to a contract and identify contract risk, there are other areas of a program that contain risk that does not follow a "WBS" structure to level needed to identify risk.

Answer Options	Do not agree			Some What agree			Fully Agree	Rating Average	Response Count
DoD Risk Management Guide	2	0	1	24	21	10	1	4.63	59
Suggested Improvements									14

Table 26. Work Breakdown Structure for Root Cause Analysis

Question 18: Does your Program Office or Risk Management IPT have a Risk Mitigation Plan?

If so, does the plan follow the suggested Guide format?

Fifty-five participants responded to this question. Table 27 provides a response breakout.

Answer Options	Does Not Follow Format			Uses Parts of the Format			Follows Format.	Rating Average	Response Count
DoD Risk Management Guide	5	1	3	17	14	11	4	4.51	55
							answered question		**55**

Table 27: Risk Mitigation Plan

Question 19: Does your Program Office or Risk Management IPT have a Risk Management Plan? If so, does the plan follow the suggested Guide format?

Fifty-eight participants responded to this question. Table 28 provides a response breakout.

Answer Options	Does not Follow Format			Uses Parts of the Format			Follows format\	Rating Average	Response Count
DoD Risk Management Guide	4	2	2	20	13	12	5	4.59	58

Table 28. Risk Management Plan

Question 20: Do you believe the Guide Risk Reporting Process provides management with the necessary information to make timely and accurate decisions?

Sixty-one participants responded to this question. Table 29 provides a response breakout.

Answer Options	Does not Provide		Provides Some Information		Provides all Information		Rating Average	Response Count
DoD Risk Management Guide	3	2	3	22	20	10	1	4.44	61

Table 29. Risk Management Information

Question 21: Does your organization use any other Risk Management tool to assess program risk? If so, please provide a description and if possible the tool.

Sixty-six participants responded to this question. Table 30 provides a response breakout. One improvement comment was received that directly relates to suggested improvements as follows:

- Currently evaluating/using a systems engineering process to help with identifying technical risks. It includes spider charts, gaps analysis, etc.

Answer Options	Response Percent	Response Count
Yes	19.7%	13
No	80.3%	53
Other Tool Description		14

Table 30. Other Risk Management Tools

Question 22: Do you have any recommended improvements to the Guide?

Thirty-three participants responded to this question. Nine improvement comments were received that directly relate to suggested improvements as follows:

- Our risk management plan was fairly good at identifying risk and developing plans to fix the issue. The problem is the get-well plans were not funded. Funding needs to be made available to make the process effective.
- Change the focus to success rather than failure.

- I think the Guide is decent, but the paradigm is to not report "red" risk items. High-risk items get downgraded to medium even if they are still high. DoD management needs to come to grips with the reality of high-risk items and ways to track and mitigate them. No one wants to present a high-risk item due to the perception that the program would be in danger of losing funding.

- I would suggest decoupling the technical performance, schedule, and cost, in the consequence matrix to arrive to a combined score of the three separate elements, instead of using a simplified single score where all three elements are tied together. This will allow for a more precise evaluation of the consequences.

- No Guide is adequate if the MDA and PM doesn't require its use. Tighten up the DoDI 5000.02 and compliance will be better.

- My recommendations would be to reassess and clearly define the risk and consequences in the Guide.

- Most programs' risks are subjectively determined and documented by the materiel developer. Suggest combat developer and evaluator input to risk of threat changing and the potential of threshold requirements not being met.

- Provide more guidance details on tracking process. It seems our PM/programs do a good job identifying risk areas and preparing risk management plans but not in "measuring" or tracking or mitigating the risk. Risk management on programs becomes more of an exercise to go through (check the box) rather than an effective tool for mitigating, planning for, managing, monitoring, and reducing risk.

- Need more training on risk management and need to insure that government agencies are using.

Summary of Results

Participation in the Guide Survey was great. The survey was sent to 122 individuals, and 81 (66.3 percent) responses were received. Responses to each question in the survey averaged 55 (45 percent) to more than 60 (49 percent). This type of response to an Internet-based random survey is exceptional. This result may be attributable to the subject matter and interest of the DoD acquisition community.

All participants identified themselves as United States Army employees. However, the survey was sent to Joint Service Program Offices. All employees in these offices must be

matrixed from the United States Army to support these efforts. The majority of the respondents' (73.4 percent) Acquisition Functional Area is Program Management or Systems Planning, Research, Development, and Engineering. Respondents included military officers and DoD civilians. Three respondents did not provide information on the employment type and grade. Most respondents (81 percent) were senior DoD employees, Level III Acquisition Certified (87.5 percent) and have been employed by the DoD for more than 15 years (67.5 percent). Participants have worked all ACAT level and non program of record efforts.

Participants provided exceptional input to their knowledge and use of the Guide questions. Additionally, many comments were received on suggested improvements that should be considered. The research hypotheses are supported. The Guide process and procedures do not provide an effective tool for managing program risk in today's acquisition environment, and both the literature review and responses received from the research survey indicated many improvements that should be considered by the acquisition community.

The DoD acquisition community should consider updating the Guide with information relating to improved risk classification, the connection between risk management and contract administration, the tie between government and contractor risk reporting methods, the positive side of risk management, risk management cube information designed to specific program areas such as financial, technical, operational, etc., discussion on program probability of success, evaluation of the program risks, pre-mitigated or post-mitigated risk activities, identification of root causes through fishbone diagrams and spider charts, information on stakeholders and leaders advocacy and strategic environment impacts, available training for risk management implementation, risks associated with different ACAT level programs, and improved information on measuring and tracking risk.

In summary, the results from the literature review and survey are very relevant to the research due to the information identified in the literature review and quantity and quality of responses received from the survey. However, there are limitations to the research and data interpretation due to the survey instrument used. Limitations are discussed in Chapter 5.

CHAPTER 5
INTERPRETATION AND RECOMMENDATIONS

Introduction

The intent of Chapter 5 is to provide interpretation of the results collected from the literature review and Guide survey and compare these results to the research hypothesis.

Chapter 5 is structured around the research results and two research hypotheses. A brief discussion of the results is presented. The research hypotheses are presented followed by a general discussion of the research results. Following the presentation of the hypotheses and general discussion is supporting information from the research. Chapter 5 is completed by presenting a summary, recommendation for future research, research limitations, recommendations, and conclusions.

Supporting research information is presented for each research hypothesis. Literature and survey results are provided in two sections. Literature review results are in the first section. Survey results are provided in the second section.

The survey results data provided in the second section were designed to capture participant's data on information provided in the Guide as follows:

- General Knowledge and Use
- Risk Management IPTs
- Program Risk Definition
- Acquisition Program Life Cycle, Risk Update, and Format
- Risk Management Reporting Matrix
- Risk Planning and Reporting
- Recommended Improvements

Research Results

Literature Review Results

Industry and DoD risk management topics are widely available on most Internet search engines. Initial search results indicate there are more than 12.9 million articles relating to DoD risk management. For industry, the numbers of Internet hits are staggering. Initial results indicate there are more than 42 million articles for risk management. However, most of the articles for both the DoD and industry are oriented to the discussion and application of risk management.

Very few are related to the assessment of how well the risk management practices help or hinder effective program management. This study is limited to six articles that discuss the benefits or detriments of the Guide.

The intent of the literature review was to determine:

- Are there available data that discusses the implementation and use of the instructions provided in the Guide?
- Are there any benefits for the use and implementation of the instructions provided in the Guide?
- Are there any shortcomings for the use and implementation of the instructions provided in the Guide?
- Are there any suggest improvements to the Guide?

These answers to these four questions are as follows:

Are there available data that discusses the implementation and use of the instructions provided in the Guide?

Data that discuss the implementation and use of the instructions provided in the Guide are not identified in the literature review. Many topics that discussed the Guide are included, but specific information in relation to implementation in a program environment is not available.

Are there any benefits for the use and implementation of the instructions provided in the Guide?

The Guide is a great basic source of instruction for instituting a risk management program in today's acquisition environment. The Guide is considered one of the DoD and industry standards for an effective risk-management program. The Guide does provide basic step-by-step instructions for risk management.

Are there any shortcomings for the use and implementation of the instructions provided in Guide?

There is no information identified that described shortcomings of the information provided in the Guide. All information reviewed indicated acceptance of the data presented in the Guide. However, a number of suggested improvements were identified.

Are there any suggest improvements to the Guide?

- Nominal risk classification of low, medium, or high may be useful for a snapshot of risk status on a program, but it does not provide enough information to allocate resources

(Sheppard, 2003, p. 132). The current Guide needs improvement for risk classification. Information on allocation of resources and program consequences based on risk would benefit PMs.

- The current Guide could be improved if it were to incorporate a more robust discussion of the nexus between risk management and contract administration (Bolles 2003, p. 141).

- The current Guide could be improved if a discussion of the relationship between contractor and government risk sharing was included (Bolles, 2003, p. 144).

- The current Guide could be improved if it were to incorporate a discussion on the tie between government and contractor risk-reporting methods (e.g., organizational responsibilities, analyses, products, etc.) (Conrow & Fredrickson, 1996, pp. 6-11).

- The current Guide could be improved if it were to incorporate a discussion on the positive side of risk management. The Guide should provide information to prepare for good circumstances that can benefit the program (Frick, 2010, p. 355).

- The current Guide could be improved if it were to incorporate a discussion on interoperable risk management (Meyers, 2006, p. 23).

DoD Risk Management Survey Results

Participation in the Guide Survey was great. The survey was sent to 122 individuals and 81 (66.3 percent) responses were received. Responses to each question in the survey averaged 55 (45 percent) to more than 60 (49 percent). This type of response to an Internet-based random survey is exceptional. This result may be attributable to the subject matter and interest of the DoD acquisition community.

Survey Participants Demographics

All participants identified themselves as United States Army employees. However, the survey was sent to Joint Service Program Offices. All employees in these offices must be matrixed from the United States Army to support these efforts. The majority of the respondents (73.4 percent) Acquisition Functional Area is Program Management or Systems Planning, Research, Development, and Engineering. Respondents included military officers and DoD civilians. Three respondents did not provide information on the employment type and grade. Most respondents (81 percent) were senior DoD employees, Level III Acquisition Certified (87.5 percent), and have been employed by the DoD for more than 15 years (67.5 percent). Participants have worked all ACAT level and non-program-of-record efforts.

Participants provided exceptional input to their knowledge and use of the Guide questions. Additionally, many comments were received on suggested improvements that should be considered. Overall, information provided in the Guide does not provide the acquisition community an effective tool in managing program risk in today's acquisition environment, based on the responses from the survey. In summary, the results from the survey are very relevant to the research due to the quantity and quality of responses received.

Research Hypothesis and Discussion of Results

Two hypotheses for this research are:

- H1: The Guide process and procedures do not provide an effective tool in managing program risk in today's acquisition environment.

- H2: Suggested Improvement to the Guide needs to be implemented.

H1—The Guide process and procedures do not provide an effective tool in managing program risk in today's acquisition environment.

General Discussion

The Research Hypothesis is supported. The Guide does not provide an effective tool in managing program risk in today's acquisition environment. Information collected through the literature review supports the hypothesis. Information collected through the risk management survey supports the hypothesis.

Supporting Information Literature Review

Literature review results indicate the Guide provides a basic tool for risk management, and the risk management process is accepted by government and industry.

Supporting Information the Guide Survey

General Knowledge and Use

Questions 1 and 2 from the Risk Management Survey were aligned to collect information on the knowledge and use of the Guide. Question 1 was designed on a knowledge scale of seven choices from not familiar to very familiar with the Guide. Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 68 (83.9 percent) of the participants responded to this question. A surprising 48.6 percent of individuals who responded to this question were less than somewhat familiar with the Guide, and only 11.8 percent were very familiar with the Guide. Question 2 was designed as a "yes/no" response to use of the risk management process provided in the Guide. Out of the 81

participants who responded to the survey, 59 (78.2 percent) participants responded to this question. Fifty-two participants responded "yes" to this question and seven participants responded "no."

The results of these two questions are confusing. If less than half of the survey population was only somewhat familiar with the Guide, how can 88.1 percent of respondents reply that they use the process defined in the Guide? Interpretation of this result may indicate personnel use parts of the Guide based on skills they have learned on the job but not skills they have learned through the Guide. This result may indicate additional acquisition workforce training on DoD risk management is required.

Risk Management IPTs

Questions 3, 4, and 5 were aligned to collect information on Risk Management IPTs. Question 3 was designed to collect information on risk management responsibility. Out of the 81 participants who responded to the survey, 56 respondents (69.1 percent) responded to this question. Fourteen participants (25 percent) believed risk management is the responsibility of the program office, and 42 respondents (75 percent) believed this is the responsibility of all organizations. Question 4 is designed to collect information on program Risk Management IPTs. Out of the 81 participants who responded to the survey, 57 respondents (70.3 percent) responded to this question. Thirty-six participants (63.2 percent) indicated their program did not have a Risk Management IPT, and 21 (36.8 percent) indicated their program did have a Risk Management IPT. Question 5 was designed to collect information on Risk Management IPT membership. Twenty-one participants responded to this question, which follows Question 4 response percentage.

Information provided in the Guide is not being used by the acquisition community. This result may be related to participants' lack of knowledge as reported in the previous section of this study. IPTs to assess program risk are lacking, based on the participants' responses. Additionally, programs that have Risk Management IPTs do not include critical members such as government contracting personnel as recommended by the Guide.

Program Risk Definition

Question 6, 7, and 17 were aligned to collect information on program risk definition. Question 6 was designed to collect information on risk management definition. Participants were given a set of four choices and asked to check all choices that apply. Out of the 81 participants

who responded to the survey, 53 (65.4 percent) responded to this question. All categories were selected, and the other response category did not provide additional relevant information. Question 7 was designed to collect information on risk management tracking. **Participants were given a set of three choices and asked to check all choices that apply.** Out of the 81 participants who responded to the survey, 55 (67.9 percent) responded to this question. All categories were selected, and participants indicated that they track risks for cost, schedule, and performance. Question 17 was designed on a knowledge scale of seven choices from "do not agree" to "fully agree" with the Guide. Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 59 (72.8 percent) of participants responded to this question. Only one participant fully agreed that the Guide is sufficient for Root Cause Analysis and Risk Identification. Twenty-seven (45.7 percent) participants indicated the WBS for root cause analysis only somewhat agree with this approach.

Information provided in the Guide is not being employed by the acquisition community. Many responses indicate program risks are being associated with current program issues and WBS root cause analysis is not an effective approach for program risk identification.

Acquisition Program Life Cycle, Risk Update, and Format

Question 8, 9, and 10 were aligned to collect information on acquisition program life cycle, frequency of program risk update, and risk reporting formats used by participants. These questions did not directly relate to information provided in the Guide. These questions were asked to gain information on the survey participants and their approach to risk updates and formats used for reporting.

Risk Management Reporting Matrix

Question 11, 12, 13, 14, and 15 were aligned to collect information on the risk management reporting matrix. Question 11 was designed on a knowledge scale of 7 choices from "does not provide" to fully portray an accurate and fair portrayal of program risk based on likelihood and consequence." Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 56 (69.1 percent) participants responded to this question. No participants believed the Risk Reporting Matrix fully portrays program risk. Fifteen (26.7 percent) participants indicated the Risk Management Matrix provides minimal portrayal of program risk. Question 12 was designed on a knowledge scale of seven choices ranging from "does not provide" to fully provide likelihood of

risk likelihood and probability of occurrence." Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 55 (67.9 percent) participants responded to this question. No participants believed the risk likelihood provides a fair assessment. Fourteen (25.4 percent) of the participants indicated the risk likelihood and probability of occurrence provides a minimal portrayal of program risk. Question 13 was designed as a "yes/no" response to modification or customization on the level of likelihood for a specific program. Out of the 81 participants who responded to the survey, 63 (77.7 percent) of participants responded to this question. Fifty-three participants responded "no" to this question, and 10 responded "yes." Question 14 was designed on a knowledge scale of seven choices from "does not provide" to "fully portray an accurate and fair portrayal of levels and type of consequence criteria." Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 61 (75.3 percent) of participants responded to this question. No participants believed consequence criteria provide an accurate or fair portrayal. Question 15 was designed as a "yes/no" response to modification or customization on the consequence criteria for a specific program. Out of the 81 participants who responded to the survey, 62 (76.5 percent) participants responded to this question. Fifty-two participants responded "no" to this question and 10 responded "yes."

The risk management reporting matrix provided in the Guide does not provide the acquisition community a good tool for risk management according to participant's survey responses. In most cases, 25 percent or more of the participants believe the matrix provides minimal risk information.

Risk Planning and Reporting

Question 18, 19, and 20 were aligned to collect information on risk planning and reporting. Question 18 was designed on a knowledge scale of seven choices from "does not follow the format" to "fully follows the format of the risk mitigation plan information provided in the guide." Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 55 (67.9 percent) participants responded to this question. Four participants fully follow the format provided in the Guide. Twenty-six (45.2 percent) of participants indicated their risk mitigation plan only uses part of the Guide format. Question 19 was designed on a knowledge scale of seven choices from "does not follow the format" to "fully follows the format of the risk management plan information

provided in the guide." Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Of the 81 participants who responded to the survey, 58 (71.6 percent) participants responded to this question. Five participants fully follow the format provided in the Guide. Twenty-eight (48.2 percent) participants indicated their risk management plan uses only part of the Guide format. Question 20 was designed on a knowledge scale of seven choices from "does not provide" to "provides all information to management to make timely and accurate decisions." Each of the selections relates to a 14.2 percent increment of knowledge related to the Guide. Out of the 81 participants who responded to the survey, 61 (75.3 percent) participants responded to this question. Only one participant believes the reporting process provides management information to make timely and accurate decisions. Thirty (49.1 percent) participants indicated the reporting process only provides some information to management.

Recommended Improvements

Questions 21 and 22 were aligned to collect information on other risk management tools in use by participants and recommended improvements. Other tools were not identified and recommended improvements are discussed later in this chapter.

H2—Suggested Improvement to the Guide needs to be implemented.

General Discussion

The research hypotheses are supported. Improvements to the Guide need to be implemented and both the literature review and responses received from the research survey indicated many improvements that should be considered by the acquisition community.

Supporting Information Literature Review

The literature review provided six suggested improvements as follows:

1. Nominal risk classification of low, medium, or high may be useful for a snapshot of risk status on a program, but it does not provide enough information to allocate resources. (Sheppard, 2003, p. 132). The current Guide needs improvement for risk classification. Information on allocation of resources and program consequences based on risk would benefit PMs.

2. The current Guide could be improved if it were to incorporate a more robust discussion of the nexus between risk management and contract administration (Bolles 2003, p. 141).

3. The current Guide could be improved if a discussion of the relationship between contractor and government risk sharing was included (Bolles, 2003, p. 144).

4. The current Guide could be improved if it were to incorporate a discussion on the tie between government and contractor risk reporting methods (e.g., organizational responsibilities, analyses, products, etc.) (Conrow & Fredrickson, 1996, pp. 6-11).

5. The current Guide could be improved if it were to incorporate a discussion on the positive side of risk management. The Guide should provide information to prepare for good circumstances that can benefit the program (Frick, 2010, p. 355).

6. The current Guide could be improved if it were to incorporate a discussion on interoperable risk management (Meyers, 2006, p. 23).

Supporting Information the Guide Survey

The Guide Survey resulted in many suggested improvements to the Guide. Many repetitive comments were received from the participants. Ten possible improvements were identified as follows:

1. The current Guide could be improved if the risk management cube information were designed to specific program areas such as financial, technical, operational, etc.

2. The current Guide could be improved if a discussion on program probability of success were included.

3. The current Guide could be improved if information is provided on evaluation of the program risks.

4. The current Guide could be improved if information is provided on pre-mitigated or post-mitigated risk activities.

5. The current Guide could be improved if information is provided on risk associated with programs in different stages of the life cycle.

6. The current Guide could be improved if information is provided on identifying root causes through fishbone diagrams and spider charts.

7. The current Guide could be improved if information is provided on stakeholders and leaders advocacy and strategic environment impacts.

8. The current Guide could be improved if information is provided on available training for risk management implementation.

9. The current Guide could be improved if information is provided on risks associated with different ACAT level programs.

10. The current Guide could be improved if information is provided on measuring and tracking risk.

Summary

The Strategy Research Project consists of the review of the Guide and risk management documentation and articles from multiple Internet sources. Review and presentation of the Guide was conducted to provide the reader of this report a general understanding of DoD risk management practices. Risk management documentation and articles provide an understanding of the effectiveness and usefulness of risk management practices.

Additionally, this study includes a survey to understand risk management practices currently in use by the DoD acquisition community. The survey was aligned to gather data on knowledge and relevance of the Guide, respondent demographics, and other risk management tools currently in use by the acquisition community.

This study was aligned to applied research and the solution of issues. This study was conducted for the purpose of evaluating ongoing instructions for DoD acquisition program risk management. This study follows the descriptive research method. A review of available applicable data and a survey to address the research question and research hypothesis were included. The study is designed to measure the effectiveness of current policy in relation to risk management.

The study identified the Guide provides a basic tool for risk management and the Guide is accepted by government and industry. The Guide does not provide an effective tool for management of the wide variety of projects ongoing in the DoD acquisition environment. Many recommended improvements to the Guide were identified through this research. Other risk management tools currently in use by the acquisition community were not identified in this research.

Recommendations for Future Research

This study provides the start of Guide analysis. Future researchers can build on this study in many ways to include:

- Analysis of risk management requirements and needs of personnel in each of the acquisition functional areas.
- Analysis of risk management requirements and needs of personnel in different acquisition category program efforts.

- Application of tools such as Monte Carlo, fishbone diagrams, and spider charts to DoD risk management practices.

- Required and applicable risk management training programs for the DoD acquisition community.

- Research to address strategic risk management in relation to political environments and projected DoD funding levels.

- Allocation of program resources for risk management.

- Successful ties between government and industry risk management.

Research Limitations

Literature Review

Industry and DoD risk management topics are widely available on most Internet search engines. Initial search results indicate there are more than 12.9 million articles relating to DoD risk management. For industry, the numbers of Internet hits are staggering. Initial results indicate there are more than 42 million articles for risk management. However, most of the articles for both the DoD and Industry are oriented to the discussion and application of risk management. Very few are related to the assessment of how well the risk management practices help or hinder effective program management. This study is limited to a few articles that discuss the benefits or detriments of the Guide.

Research Questionnaire

Considering there are hundreds of thousands of members of the acquisition workforce programs, there is a limit to the number of individual surveys that can be analyzed. The survey was designed to accommodate input from many acquisition community members' across functional fields but is only a select sample of all involved with the acquisition of products for the Joint Services.

Survey Instrument

The Internet survey tool used for this research provided an effective way to gain comments from the acquisition community. However, the tool only will allow the user to gain compiled data in relation to the question. The tool does not permit detailed analysis of the results based on single respondent information or a group of respondents. For instance, sorting and analyzing information on respondents related to acquisition career field or ACAT program were

not permitted through use of this tool. This type of information may have permitted an assessment of the Guide to functional area or ACAT level program efforts.

Recommendations

The DoD acquisition community should consider updating the Guide with information relating to improved risk classification, nexus between risk management and contract administration, tie between government and contractor risk reporting methods, positive side of risk management, risk management cube information designed to specific program areas such as financial, technical, operational, etc., discussion on program probability of success, evaluation of the program risks, pre-mitigated or post-mitigated risk activities, identification of root causes through fishbone diagrams and spider charts, information on stakeholders 'and leaders' advocacy and strategic environment impacts, available training for risk management implementation, risks associated with different ACAT level programs, and improved information on measuring and tracking risk.

Conclusions

The Guide provides acquisition personnel a basic guide for the assessment and presentation of program risks. The Guide provides a process for risk management, key activities for risk identification, analysis and mitigation, and information on risk planning and preparation activities for risk management.

The Guide is the DoD's effort to establish a baseline for the management and reporting of program risk. Overall, the Guide presents a risk management matrix that projects program risk based on levels of likelihood and consequence criteria.

The Guide and management matrix are used by many DoD acquisition programs and presented at many meeting to senior level leaders as the tool for risk management. Over the past years, during multiple meetings and program reviews, risk reporting in accordance with the Guide has come into question by many individuals at meetings or program reviews. Questions concerning the applicability, reliability, and accuracy of the data presented based on the Guide can sometimes relate to the process for risk management opposed to program related risks.

Risk management is critical for program success. Presentation and understanding of program risks by all individuals who have concern about the program is also critical for program success. Having the right tool, at the right time that allows full definition and understanding of program risk is critical for successful program management.

The Strategy Research Project consisted of the review of the Guide and risk management documentation and articles from multiple Internet sources. Review and presentation of the Guide is conducted to provide the reader of this report a general understanding of DoD risk management practices. Risk management documentation and articles provide an understanding of the effectiveness and usefulness of risk management practices.

Additionally, this study included a survey to understand risk management practices currently in use by the DoD acquisition community. The survey was aligned to gather data on knowledge and relevance of the Guide, respondent demographics, and other risk management tools currently in use by the acquisition community.

The study identified the Guide provides a basic tool for risk management and the Guide is accepted by government and industry. The Guide does not provide an effective tool for management of the wide variety of projects ongoing in the DoD acquisition environment. Many recommended improvements to the Guide were identified through this research. Other risk management tools currently in use by the acquisition community were not identified in this research.

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GLOSSARY OF ACRONYMS AND TERMS

ACAT   Acquisition Category

AIS   Automated Information System

DAU   Defense Acquisition University

DoD   Department of Defense

ER   Environmental Restoration

EVM   Earned Value Management

FAR   Federal Acquisition Regulation

FY   Fiscal Year

IMS   Integrated Master Schedule

IPT   Integrated Product Team

KPP   Key Performance Parameter

LCC   Life Cycle Cost

MILCON   Military Construction

WBS   Work Breakdown Structure

APPENDIX A
RISK MANAGEMENT GUIDE FOR DOD ACQUISITION OVERVIEW

***Risk Management Guide for DoD Acquisition* Overview**

The Guide provides acquisition personnel a basic guide for the assessment and presentation of program risks. The Guide provides a process for risk management, key activities for risk identification, analysis and mitigation, and information on risk planning and preparation activities for risk management.

The Guide is the DoD effort to establish a baseline for the management and reporting of program risk. Overall, the Guide presents a risk management matrix that programs risk based on levels of likelihood and consequence criteria.

The Guide defines program risk as:

Risk is a measure of future uncertainties in achieving program performance goals and objectives within defined cost, schedule, and performance constraints. Risk can be associated with all aspects of a program (e.g., threat, technology maturity, supplier capability, design maturation, performance against plan,) as these aspects relate across the Work Breakdown Structure (WBS) and Integrated Master Schedule (IMS). Risk addresses the potential variation in the planned approach and its expected outcome. While such variation could include positive as well as negative effects, this guide will only address negative future effects since programs have typically experienced difficulty in this area during the acquisition process (DoD, 2006).
Risks have three components:

- *A future root cause (yet to happen), which, if eliminated or corrected, would prevent a potential consequence from occurring,*
- *A probability (or likelihood) assessed at the present time of that future root cause occurring, and*
- *The consequence (or effect) of that future occurrence.*

A future root cause is the most basic reason for the presence of a risk. Accordingly, risks should be tied to future root causes and their effects (DoD, 2006).

The Guide further defines Program Risk Management and includes a risk management model that states program risk has five key activities and is performed throughout the program life cycle:

Risk management is a continuous process that is accomplished throughout the life cycle of a system. It is an organized methodology for continuously identifying and measuring the unknowns; developing mitigation options; selecting, planning, and implementing appropriate risk mitigations; and tracking the implementation to ensure successful risk reduction. Effective risk management depends on risk management planning; early identification and analyses of risks; early implementation of corrective actions; continuous monitoring and reassessment; and communication, documentation, and coordination (DoD, 2006).

Acquisition program risk management is not a stand-alone program office task. It is supported by a number of other program office tasks. In turn, the results of risk management are used to finalize those tasks. Important tasks, which must be integrated as part of the risk management process, include requirements development, logical solution and design solution (systems engineering), schedule development, performance measurement, EVM [Earned Value Management] *(when implemented), and cost estimating. Planning a good risk management program integral to the overall program management process ensures risks are handled at the appropriate management level (DoD, 2006).*

Emphasis on risk management coincides with overall DoD efforts to reduce life-cycle costs (LCC) of system acquisitions. New processes, reforms, and initiatives are being implemented with risk management as a key component. It is essential that programs define, implement, and document an appropriate risk management and mitigation approach. Risk management should be designed to enhance program management effectiveness and provide PMs with a key tool to reduce LCC, increase program likelihood of success, and assess areas of cost uncertainty (DoD, 2006).

The risk management process model (see Figure 1) includes the following key activities, performed on a continuous basis:

- *Risk Identification,*
- *Risk Analysis,*
- *Risk Mitigation Planning,*
- *Risk Mitigation Plan Implementation, and*
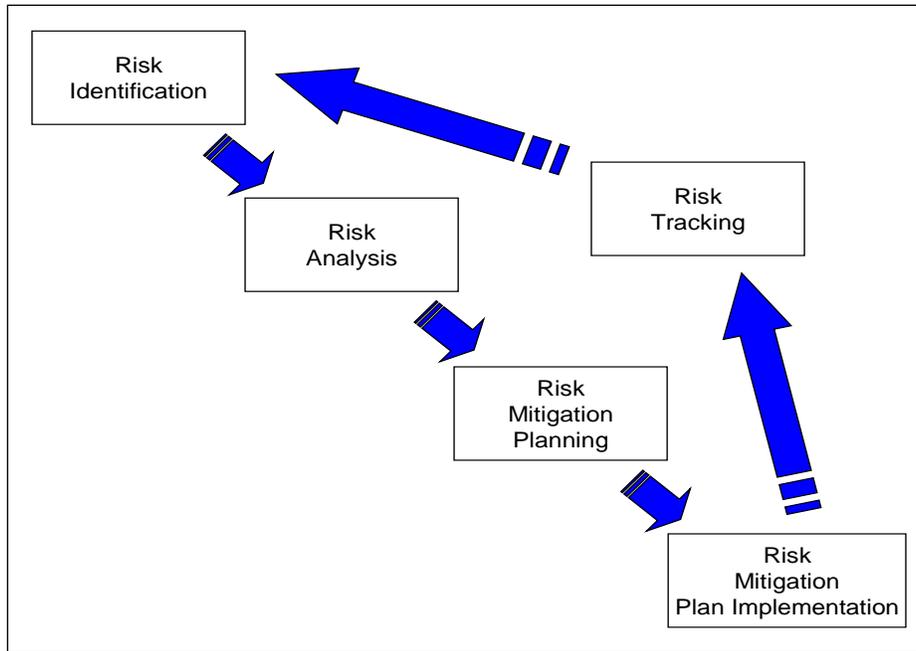- *Risk Tracking (DoD, 2006).*

Figure 1. DoD Risk Management Process

The Guide provides a Risk Management Cube (Figure 2) for the presentation of program risk that portrays risk in red, yellow, and green. These ratings allow a quick visual assessment of program risk. A red rating indicates high risk to the program, yellow ratings indicate moderate risk to the program, and green risk identifies low program risks. The risk management cube is populated through the use of a level of likelihood criteria (Figure 3) and consequence criteria (Figure 4).

Each undesirable event that might affect the success of the program (performance, schedule, and cost) should be identified and assessed as to the likelihood and consequence of occurrence. A standard format for evaluation and reporting of program risk assessment findings facilitates common understanding of program risks at all levels of management. The Risk Reporting Matrix below is typically used to determine the level of risks identified within a program. The level of risk for each root cause is reported as low (green), moderate (yellow), or high (red) (DoD, 2006).
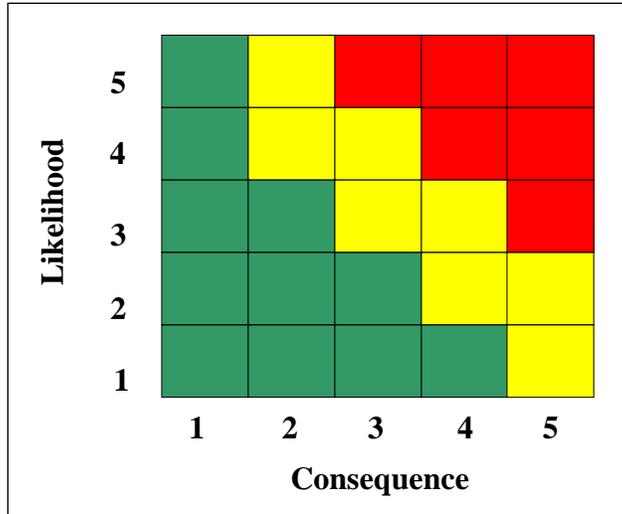
.

Figure 2. Risk Reporting Matrix

The level of likelihood of each root cause is established utilizing specified criteria (Figure 3). For example, if the root cause has an estimated 50 percent probability of occurring, the corresponding likelihood is Level 3 (DoD, 2006).

	Level	Likelihood	Probability of Occurrence
Likelihood	1	Not Likely	~10%
	2	Low Likelihood	~30%
	3	Likely	~50%
	4	Highly Likely	~70%
	5	Near Certainty	~90%

Figure 3. Levels of Likelihood Criteria

Level	Technical Performance	Schedule	Cost
1	Minimal or no consequence to technical performance	Minimal or no impact	Minimal or no impact
2	Minor reduction in technical performance or supportability, can be tolerated with little or no impact on program	Able to meet key dates. **Slip < _*_ month(s)**	Budget increase or unit production cost increases. **< _**_ (1% of Budget)**
3	Moderate reduction in technical performance or supportability with limited impact on program objectives	Minor schedule slip. Able to meet key milestones with no schedule float. **Slip < _*_ month(s) Sub-system slip > _*_ month(s) plus available float.**	Budget increase or unit production cost increase **< _**_ (5% of Budget)**
4	Significant degradation in technical performance or major shortfall in supportability; may jeopardize program success	Program critical path affected. **Slip < _*_ months**	Budget increase or unit production cost increase **< _**_ (10% of Budget)**
5	Severe degradation in technical performance; Cannot meet KPP or key technical/supportability threshold; will jeopardize program success	Cannot meet key program milestones. **Slip > _*_ months**	Exceeds APB threshold **> _**_ (10% of Budget)**

Figure 4. Levels and Type of Consequence Criteria

The level and types of consequences of each risk are established utilizing criteria such as those described in Figure 4. A single consequence scale is not appropriate for all programs, however. Continuing with the prior example of a root cause with a 50 percent probability of occurring, if that same root cause has no impact on performance or cost, but may likely result in a minor schedule slippage that won't impact a key milestone, then the corresponding consequence is a Level 3 for this risk. For clarity, it is also classified as a schedule risk since its root cause is schedule related (DoD, 2006).