



**ACQUISITION PROGRAM RE-BASELINES:  
THEORY & PRACTICE**

THESIS

Troy A. Suarez, Captain, USAF

AFIT/GRD/ENV/06M-11

**DEPARTMENT OF THE AIR FORCE  
AIR UNIVERSITY**

***AIR FORCE INSTITUTE OF TECHNOLOGY***

---

**Wright-Patterson Air Force Base, Ohio**

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States Government.

AFIT/GRD/ENV/06M-11

ACQUISITION PROGRAM RE-BASELINES: THEORY & PRACTICE

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Research and Development Management

Troy A. Suarez, BS

Captain, USAF

March 2006

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.



## **Abstract**

The United States Government requires every program manager in the Department of Defense to document program goals prior to the initiation of an acquisition program. According to the Defense Acquisition Guidebook (2005), an Acquisition Program Baseline (APB) satisfies this requirement. The APB describes the program goals through a list of objectives and thresholds for the cost, schedule and technical performance parameters. Updating the APB, also referred to as re-baselining, may also be required during the execution of an acquisition program. Although guidance is available for the initial production of a program baseline, scarce information on the guidance and theoretical purpose of a program re-baseline exists. The research presented in this thesis investigated the purpose and effectiveness of program re-baselines through interviews with twenty seven program managers from the acquisition community. An analysis of the data collected during the interviews, combined with an extensive review of the current literature, led to recommendations in the areas of improved guidance, practice and education. Specifically, it was revealed that the purpose of a re-baseline varies depending on an individual's past experiences with a re-baseline activity. In addition, this research revealed that a majority of program managers have participated in a program re-baseline during their careers, which magnifies the importance of clarifying the expectations and objectives of program re-baselines for those entering the acquisition profession.

## **Acknowledgments**

I would like to express my sincere appreciation to my committee, Major Leach, Dr. Heminger, and Mr. Mable, for their guidance and support throughout the course of this thesis effort. The insight and experience was certainly appreciated.

I am also indebted to the many acquisition professionals who spent their valuable time answering the interview questions and providing their insight relating to the re-baseline process. Finally, I want to thank my wife, who tolerated the late nights and endless requests to proofread and edit my research documentation.

Troy A. Suarez

## Table of Contents

	Page
Abstract .....	iv
Acknowledgements .....	v
Table of Contents .....	vi
List of Tables .....	viii
I. Introduction .....	1
Background .....	1
Scope and Methodology .....	4
Preview.....	5
II. Literature Review .....	6
Background .....	6
Introduction to Defense Acquisition Programs .....	6
History of Baselines .....	8
Congressional Guidance .....	10
Department of Defense Guidance .....	11
Department of Defense Baseline Theory.....	12
Introduction to Acquisition Program Re-baselines .....	12
What’s Wrong with the Current Acquisition Process .....	13
Baseline Concerns Outside the Department of Defense.....	14
III. Methodology .....	16
Overview.....	16
Selection of Research Method.....	16
Qualitative Research Design .....	17
Data Analysis .....	21
Other Considerations.....	23
IV. Data Analysis .....	24
Overview .....	24
Demographics.....	24
Data Analysis .....	25
Investigative Question 1 .....	25
Investigative Question 2 .....	28
Investigative Question 3 .....	29
Additional Program Re-baseline Research.....	31
Supplemental Question 1.....	31
Supplemental Question 2.....	33

Supplemental Question 3.....	35
	<b>Page</b>
V. Results & Recommendations.....	38
Overview.....	38
Conclusion.....	38
Recommendations for Practitioners.....	40
Recommendations for Guidance .....	40
Recommendations for Education .....	42
Recommendations for Information Dissemination.....	44
Limitations.....	45
Recommendations for Future Research.....	46
Summary .....	46
Bibliography.....	48

## List of Tables

<b>Table</b>	<b>Page</b>
1. Interview Questions.....	20
2. What is the theoretical objective of a program re-baseline? .....	27
3. What is considered a successful program re-baseline? .....	28
4. Describe any program re-baseline guidance.....	29
5. Is the program re-baseline process effective? .....	30
6. Does the outcome of the re-baseline process justify the effort?.....	31
7. In your experience, what caused a program to re-baseline?.....	33
8. Are there issues relating to the re-baseline process? .....	35
9. Recommendations for improving the re-baseline process.....	37

# **Acquisition Program Re-baselines: Theory & Practice**

## **I. Introduction**

### **Background**

In the past, the government has made an attempt to acquire weapon systems faster and cheaper with increased capabilities. This is evident by the reform initiatives launched by the government with respect to the acquisition management process. Studies have been conducted on the effect government acquisition reform initiatives such as the Packard Commission and the Federal Acquisition Streamlining Act (FASA) have made on the acquisition process (Searle, 1997). Research has shown that while these initiatives were aimed at reducing cost overruns and schedule delays, little change has been noticed to the amounts of overruns and delays incurred by defense weapon system acquisitions (Searle, 1997, Drezner et al, 1993). In fact, one report shows that reform initiatives, which impacted 197 programs studied, did not reduce cost growth (Searle, 1997, Drezner et al, 1993).

Meanwhile, with the increased cost, schedule, and performance comes greater scrutiny and attention from Congress. The United States Government has required that the Department of Defense (DoD) comply with Title 10, Sections 2435 and 2220 of the US Code Title 10, which require every program manager to document program goals prior to program initiation, Milestone B. According to Chapter 2.1.1 of the Defense Acquisition Guidebook (2005), an Acquisition Program Baseline (APB) satisfies this requirement. The APB describes the programs goals through a list containing objectives and thresholds for each cost, schedule, and technical performance parameter. For cost

thresholds and objectives, the best available estimates are used, while schedule and technical performance parameters are defined with the help from the user community.

The Defense Acquisition Management Framework consists of five phases. The phases are listed in sequential order: Concept Refinement, Technology Development, Development and Demonstration, Production and Deployment, and Operations and Support (DoDI 5000.2, 2003). When the DoD decides to award a development and production contract to a defense contractor, this also indicates the start of a program office for that particular system. This is Milestone B and it signifies the point in time when a Program Manager (PM) takes over the management of the program. After Milestone B, the development and demonstration phase begins. During this acquisition phase, quarterly and/or annual reviews occur to assess the current risks, shortfalls, and successes of each program with their respective Milestone Decision Authority (MDA) or Program Executive Officer (PEO), depending on the ACAT (Acquisition Category) level of a program. The ACAT level is determined by the dollar value and MDA special interest (DoDI 5000.2, 2003). Programs range from ACAT level I to level III with ACAT level I having the largest dollar value. For larger programs and programs with Office of the Secretary of Defense (OSD) or Congressional special interest oversight, information is provided through reviews in a Selected Acquisition Reports (SARs). Since 1975, Congress has mandated the information contained in the SARs be supplied to Congress for review (GAO-05-182, 2005). The intent of a SAR is to provide OSD and Congress with adequate information about each program's status to allow decision makers to make informed funding determinations. For smaller programs, the MDA, or PEO, receives similar information on their respective programs. With respect to ACAT I

or special oversight programs, a recent Government Accountability Office (GAO) report indicates that SARs could provide “more complete, timely and accessible information” (GAO-05-182, 2005). One issue within this report discusses the problems with reporting program re-baselining. A program re-baseline can occur for various reasons: when entering a new acquisition phase; when technical requirements need refinement; when restructuring; when experiencing cost overrun or schedule delay beyond thresholds in the APB; and finally, when a violation of the Nunn-McCurdy unit breach cost occurs (GAO-05-182, March 2005). Although much guidance is available for the initial production of a program baseline, scarce information on the guidance and theoretical purpose of a program re-baseline exists. This research effort will attempt to define and clarify the objectives of a program re-baseline.

It is likely that a majority of the experienced re-baselines will occur during the development phase. Research has shown that at a minimum, 45% of projects were re-baselined at least twice during the development phase (McNutt, pg 293, 1998). This case study will explore the theory and guidance that currently exists for re-baselining a program as it compares to current practice. This will determine if program re-baselining is producing the results originally intended for an Air Force weapon system acquisition program as prescribed by theory and guidance. Specifically, this research will attempt to determine if the practice of re-baselining an Air Force system acquisition program meets its intended purpose as prescribed by theory and guidance. There are three phases in which a baseline can occur: the technology development, development and demonstration, or production and deployment phase. This research will focus on the

guidance and theory versus the practice of re-baselines with no preference to the acquisition phase.

### **Scope and Methodology**

The process for this study will follow steps described by experts such as Yin (2003) and Creswell (1994, 1997). An exploratory case study approach was chosen because very little evidence exists on prior research involving program re-baselines. The evidence found is a report on program re-baselines by the Government Accountability Office (GAO) which describes some of the issues involving the communication of a program's status. This study's primary focus was on program managers from a single Air Force Product Center. Secondary sources include individuals with acquisition experience at an adjacent organization. It should be noted that although participants will only be selected from the two organizations, the experience of each program manager will stretch across the entire Air Force acquisition community involving programs from all Air Force Product Centers.

This research effort will primarily consist of two forms of data. The first is historical literature on the history of program re-baselines and also on the current guidance provided to acquisition personnel relating to the re-baseline process. The second source of data will come in the form of interview responses. After selecting the organizations for this case study, a group of program managers from a single Product Center will be asked to participate in an interview which will be used to answer the investigative questions by triangulating with the historical data.

As Yin recommends, the initial data analysis will consist of detailed descriptions that will help the researchers gain familiarity with data (Yin, 2003). Throughout this

study, a search for any conflicting or similar literature will be performed to build internal and external validity. Analysis will include evaluating literature on the history, theory and guidance of program re-baselines and compare these evaluations to the responses gathered from the interviews. Another aspect of analysis will compare the theory and guidance versus the current practice of program re-baselines.

### **Preview**

The following study will determine if the purpose and effectiveness of program re-baselines in practice match the theory. The next step involved a thorough literature review to find the history of re-baselines as well as the theoretical objective of the re-baseline process. Following the literature review, the methodology and research design will be discussed. After collecting the data, the analysis step clarified the views and perceptions program managers have towards the re-baseline process. Finally, the last section answers the research question and provides recommendations for improving the re-baseline process.

## **II. Literature Review**

### **Background**

This research effort will focus on comparing the theory and guidance versus the current practice of the program re-baseline process and purpose. By examining relevant literature and while defining the theory and guidance related to acquisition program re-baselines, this chapter will familiarize the reader with program re-baselines and their role in the overall acquisition of a weapon system within the Department of Defense (DoD). Though the review reveals that a lack of guidance and understanding of the purpose and effectiveness of program re-baselines exists within the DoD, it will explore applicable statutes, directives, instructions, and guidance to help form a basis for the research questions. Literature will provide a description of the current issues facing acquisition programs and the role program re-baselining plays in those circumstances. The chapter then concludes with familiarization material pertaining to the methodology chosen for this exploratory study.

### **Introduction to Defense Acquisition Programs**

According to the Defense Acquisition University, the acquisition system is in place to provide a secure and sustainable military to support our national strategies (IDAM, 2001). The framework for defense acquisition leadership determines the phases that a typical program progresses through. At the end of each phase, a program direction decision must be made (GAO-05-182).

The acquisition process starts with a need identified by users in the field. This need can arise from a capability gap in our current arsenal, a new technology that may increase our effectiveness on the battlefield, or a new threat. A set of capabilities to

address the identified need are defined. A number of panels review the capabilities to determine which are the most urgent and/or necessary. The chosen capabilities are then published in the Initial Capabilities Document (ICD). After an Analysis of Alternatives (AoA) is performed and the industry has been consulted, a determination is made to either look for a non-material solution to meet the capabilities gap or request proposals to enter into the development phase of the weapon system program. This phase will produce another capability document called the Capability Development Document (CDD) which, along with an updated performance section, will also have a financial and schedule strategy that shows “a military useful and supportable operational capability...can be effectively developed, produced or acquired, deployed and sustained.” (CJCSI 3170.01E, 2005) It is during this time that the initial Acquisition Program Baseline (APB) is produced. A source selection will be conducted to evaluate the competing contractor’s proposals and make a selection to the contractor that proposes the best value relating to the cost, schedule and technical feasibility of the weapon system. This is called Milestone B, and is also the time when a program office is formed. At Milestone B, the APB is approved. The final capability document called the Capability Production Document (CPD) is approved at the end of the Development and Demonstration phase. This is called Milestone C and is also when the MDA determines if the program is ready to move into the Production and Deployment phase.

## **History of Baselines**

Programs within the DoD have historically been filled with new or never been accomplished before technology. This has led to difficult risk assessments and inaccurate cost estimates, which have led to cost overruns and schedule growth for defense programs. Since the warfighter needs the technology, and a new start would mean increased funding for the program, it was usually too late in the process to simply cancel a program. As a result, the continued decision to either cut production units or increase funding for the program has been the norm. These programs stayed alive because the technology was needed and a new start wasn't a viable option. In the 1950's, the DoD understood that the complexity of weapon systems development and their corresponding contracts required a more involved and elaborate management system than the standard system used in industry. Tools such as PERT, the Program Evaluation and Review Technique, used by the Navy in the 1960's and then the Cost/Schedule Control System Criteria (C/SCSC) developed by the Air Force and later implemented by OSD in 1967 in the DoDI 7000.2, labeled the "Performance Measurement for Selected Acquisitions" began to put pressure on the DoD to change the management system. This pressure led to all services, and industry, working with a single standard for management criteria, C/SCSC. These criteria enabled the use of an integrated management technique for managers called Earned Value Management or EVM (Abba, 2000).

Earned Value was first introduced by industrial engineers more than one hundred years ago (Fleming & Koppelman, 1999). Only after some time of refining their initial efforts did these engineers realize that relating earned standards against the actual hours provided the true cost performance. Today's use of earned value is based on the work of

these pioneers. This concept was first used by the Air Force's Minuteman Missile Program during the 1960s (Fleming & Koppelman, 1999). In 1996, this technique was termed the Earned Value Management System (EVMS) with a few small changes to the criteria from the C/SCSC technique (Fleming & Koppelman, 1999). EVM is defined as a system that allows a manager to monitor the progress of a program with details of the integrated cost, schedule, and performance parameters by relating resource planning to cost and schedule requirements (DACS GP-28 V 1.2, 2004). Within the EVM concept, the idea of a baseline was born. One of the plans, the Budgeted Cost of Work Scheduled (BCWS), is the time-specific budget for an effort. The BCWS is also known as a baseline that allows managers to predict cost and schedule variances and estimates of completion. These predictions and estimates can help managers see problems with cost, schedule or technical performance progress before they get out of control (DACS GP-28 V 1.2, 2004).

During the time that EVM started to emerge as the leading managerial technique for major defense weapon systems, the Government began research on the cost, schedule, and performance problems related to these programs. In 1986, the Packard Commission discussed the lack of stability for major weapon systems as an important concern and gave two recommendations for combating the instability. The first recommendation involved the use of multi-year funding for procurement. More importantly, the second recommendation stated a need to require and implement a baseline for all programs at the start of the development phase (Packard Commission, 1986). Also in 1986, statutes were passed with baseline requirements (10 USC 2435).

## **Congressional Guidance**

As part of the United States Code: Title 10: Subtitle A: Part IV: Chapter 144: Section 2435 (10 USC 2435): the baseline description states the Secretary of Defense (SecDef) will determine the appropriate baseline descriptions for each program that includes the cost, schedule, and performance parameters (10 USC 2435) . This assures Congress that their large investments in today’s weapon systems are adequately determined to be supportable financially, technically and politically, while providing our services with the equipment necessary to maintain the top military in the world. Also included under the baseline description is the clear direction that without an approved acquisition baseline, after the system enters the Development and Demonstration phase, no amount of appropriated funds will be obligated (10 USC 2435). Similar verbiage is provided when describing the schedule for such programs before entering the production and deployment phase. The statute also mandates that the Secretary of Defense (SecDef) will determine the regulations with respect to reporting deviations from the approved baseline with regard to cost, schedule, performance and supportability of the program. It also gives the SecDef the power to determine the “Procedures for review of such deviation reports with the DoD...procedures for submission to, and approval by, the SecDef of revised baseline descriptions” (10 USC 2435). This section of the statute is self explanatory and should describe to the reader the highest level of baseline requirements and regulation.

Congress also gets involved with major weapon system programs. Since 1975, a Selected Acquisition Report (SAR) has provided Congress with annual updates on a

program's cost, schedule, and technical performance status (GAO-05-182). This enables a more informed decision for Congress when the program's future is determined.

### **Department of Defense Guidance**

According to section 3.7.2.5, Entrance Criteria, of the DoD Instruction 5000.2 (2005) all programs will have an Acquisition Program Baseline (APB) providing objectives and thresholds for the cost, schedule, and performance parameters throughout its life cycle. This is in reference to the specific entrance criteria required for an acquisition program to move to the next phase of the program. The Defense Acquisition Guidebook (DAG) mentions that an APB serves as the document that allows the DoD to comply with 10 USC 2435. The DAG serves as a complimentary document to further clarify and explain the acquisition process and DoD directives, regulations and instructions. The DAG also states that the role of producing the APB lies with the program manager who, with help from his team and the user community, determines the baseline performance and schedule requirements along with best estimates of total cost equal to projected funding. For program managers, Air Force guidance on baselines refers to DoD Directive 5000.1 and DoD Instruction 5000.2.

### **Department of Defense Baseline Theory**

Although numerous reports and documents exist that explain and define managerial concepts such as C/SCSC and EVMS, an accurate and consistent definition or theory for defense systems acquisition baselines is scarce. The best definition of a baseline used for managing defense programs is "a quantity or quality used as a starting point for subsequent efforts and progress measurement to include cost, schedule and performance baselines." (DSMC Fact Sheet, 1997) The Defense Systems Management

College (DSMC) fact sheet also agrees with the DoD Directive 5000.1 that in theory “program baseline parameters shall serve as control objectives” (DoDD 5000.1, May 2003).

### **Introduction to Acquisition Program Re-baselines**

A program re-baseline is defined as the process that occurs in the event the PM revises the APB due to restructuring or unrecoverable deviations, otherwise known as a parameter breach. The purpose of a re-baseline is to regain control of a program with an updated APB based on changes to the cost, schedule, or performance parameters. A re-baseline is also needed for the milestone decision authority to make key decisions about the program’s future. If a breach occurs, the MDA is required to conduct a complete program evaluation and determine if alternative concepts or designs would better serve the needs of the warfighter (DAG, 2004). A recent GAO report reaffirms the re-baseline definition stating that changes to the baseline are due to: a breach in one or more parameter thresholds, phase changes, or restructuring (GAO-05-182). The thresholds were established in the original APB. In most cases, the decision to re-baseline occurs at annual reviews which evaluate current and future risks, rising cost, schedule and technical performance trade-offs, and the defining of exit criteria. Another notable reason to re-baseline occurs when a program exceeds unit cost thresholds called the Nunn-McCurdy unit cost breach (GAO-05-182).

The investigator has yet to find guidance and instruction that explain how a program should be re-baselined. However, determining precisely when re-baselining a program should occur is briefly explained in the DAG. The guidance states that a Program Manager is required to immediately notify the MDA if any thresholds in the

APB are breached. There is a timeline of thirty days for notifying the MDA of the reason for the breach and ninety days for a program to be back within APB parameters or a change only in the breached parameters (DAG; 487, 2004).

### **What's wrong with the Current Acquisition Process**

The Department of Defense has spent significant amounts of time and energy trying to discover the cause of, and finding solutions to, the cost overruns, major schedule delays, and technical performance flaws prevalent in current weapon system acquisitions. Research efforts by civilian and military groups have been unable to discover the exact cause of the issues mentioned above. In a study by Drezner et al. (1993), it was discovered that reform initiatives failed in reducing cost overruns from 1960 to 1990. A similar study using a different data set found that over an 8-year period, 1988 through 1995, Air Force managed major weapon system contracts experienced an increase in cost overruns (Searle, 1997). Poor cost estimation was determined to be a consistent factor of poor cost performance for each study. Searle (1997) said it best when he stated “despite the implementation of more than two dozen regulatory and administration initiatives, there has been no substantial improvement in the cost performance of defense programs for more than 30 years.” Although continued research is currently looking into solving the problems above, no clear answer has been offered.

While several research efforts focus on finding a cause for cost overruns, schedule delays and performance shortfalls, this study will investigate the theory and guidance versus the current practice of the program re-baseline process and purpose of using the

re-baseline tool to adjust program goals so they can accurately reflect current program situations.

### **Baseline Concerns Outside The Department of Defense**

Although a majority of program scrutiny occurs on major defense systems, other sectors of the U.S. government are dealing with programmatic issues relating to re-baselines, in particular the Federal Aviation Administration (FAA). A National Airspace System (NAS) Configuration and Evaluation Staff found:

While the FAA has undertaken a significant number of program re-baseline actions in the past two years, the process for modifying baselines has not been consistently applied. Agency guidance related to the re-baseline process, including the documentation required for these actions, is vague and incomplete.

Both recommendations are consistent with DoD guidance with respect to re-baselining a program due to cost, schedule, or performance threshold breaches and/or when a major shift in the goals or strategy occur (FAA, 2000).

Finally, it should also be noted that if someone only focused on defense contracts they would not get the right perspective when compared to other government projects. The research conducted by Searle (1997) and Drezner et al. (1993) focused their attention strictly on DoD contracts. Although defense acquisition programs witness cost overruns and schedule delays, this phenomena is not uncommon. But according to one report, most DoD projects witness cost overruns that are lower than the norm for government contracts (Reig, 1995).

### **III. Methodology**

#### **Overview**

To help gather and organize this study, procedural steps from Creswell (1994) and Yin (2003) were reviewed. Little evidence has been discovered of past research in the area of program re-baselines. Based on the evidence discussed above, an exploratory qualitative approach using a case study as the design was determined to be the appropriate technique. This approach allows a researcher the flexibility to choose from several sources of data used for the purpose of discovering themes, trends, and provide documentation to a subject lacking previous research to explain a process or environment. There are two sections that will be described in this chapter; the research method and the qualitative research design. Each section will include a detailed description on the selection process and procedures experienced in this research effort. As stated by Yin and Creswell, no defined methodology exists for every qualitative research effort (Creswell, 1994, Yin, 2003). With that thought in mind, this effort will use a hybrid research method and design approach based on the recommendations of both.

#### **Selection of Research Method**

The basis for the research method chosen is derived from the recommendations by Creswell and Yin (Creswell, 1994, Yin, 2003). The first step is to determine a focus statement or question that can direct the study. For this study, the focus research question asks:

*Does the practice of re-baselining an Air Force acquisition program meet its intended purpose as prescribed by theory and guidance?*

The lack of a specific theoretical background or previous research on re-baselines, as shown in chapter two, along with a need to explore the phenomena led to the qualitative paradigm approach as deemed best for this study.

The key assumptions for this qualitative study are: the processes, as well as the outcome, are the primary concerns; the research is inductive in nature as concepts and hypotheses will be constructed; and the biases and beliefs of the researcher have a positive effect (Locke et al, 1987, Creswell 1994).

### **Qualitative Research Design**

Based on a qualitative paradigm, Creswell recommends using a case study to explore a single process or phenomenon that has bounds (Creswell, 1994). The bounds in this study center on the program re-baseline process. Yin also describes the use of a case study approach that will explore phenomenon in real situations and context that contains boundaries that are not clear (Yin, 2003). This is very apparent in the re-baseline process as no strict or clear guidance exists for this process. After the qualitative approach was finalized, the type of case study design was chosen.

With questions such as how and why the re-baseline process takes place, the type of case study chosen will be an exploratory one. The investigative questions for this study are:

1. What is the theory behind re-baselining a program?
2. What guidance exists to aid Program Managers through the re-baseline process?
3. Is a program re-baseline effort effective?

The research question attempts to define the current practice of re-baselining a program and determine the effectiveness based on the views and opinions of those in the acquisition community. The next component of defining the case study design relates to the basic issue of determining what the case actually is. With the process and purpose of program re-baselining forming the focus, a single case study approach was determined to best match this study. After choosing a single case study approach, the unit of analysis was chosen as the acquisition program re-baseline process within the Air Force. This decision is consistent with the research and investigative questions. However, as Yin mentions it was difficult to set bounds for the unit of analysis due to several variations in each acquisition program (Yin, 2003). These variations will help generalize the re-baseline process research. It should also be mentioned that with the lack of literature pertaining to this research effort, the definition of the case and unit of analysis has no basis on past research. The fourth step, logic linking the data to the propositions, is derived from the interview questions and their direct relevance to the problem statement and research questions. Due to the imprecise and undefined strategies for analyzing data, this study will base the criteria for interpreting the results on the theoretical problem statements and research questions.

An important step in the research involves analysis of the data. Before this step can occur, the types of data desired and the tools used for data collection were chosen. According to Creswell (1994), no one tries to randomly select subjects in a qualitative study. By purposefully selecting individuals that can answer your questions the best, the research is not randomly selecting research subjects (Creswell, 1994). He also recommends researchers consider four parameters: where the research will be conducted; who will be interviewed; what participants will be interviewed about; and the process undertaken by the participants (Creswell, 1994). The research will be conducted at the offices of the individuals participating in this study. The individuals selected will be from the Program Management (PM) functional career field. The subjects will be questioned about the process and purpose of re-baselining an acquisition program. Because the research will gather views and opinions from individuals at one place in time, the researcher acknowledges that the views and opinions will change as the participants experience the re-baseline process in the future.

Next, the type of data collection tool was determined. With their ability to provide information on a process, interviews were chosen as the best tool for collecting data from the program managers (PMs) on the program re-baseline process. The purpose of the interview is to gather the opinions and views of the interviewees. With this purpose in mind, Creswell and Yin recommend using an open-ended or semi-structured interview approach (Creswell, 1994, Yin, 2003). This approach allows a researcher to gather insight and opinions on the subject matter and possibly offer other interviewee candidates and sources of evidence (Yin, 2003).

For this research effort, interviewees were chosen from PMs within a single Product Center and from an adjacent unit. Permission to conduct interviews was granted from the Air Force Research Laboratory (AFRL) Internal Review Board and a representative of civilian government employees. The questions asked to the interviewees are provided in the Table 1.

Table 1. Interview Questions

	Question
<b>Re-baseline Questions</b>	1. Have you ever been involved with the re-baseline of an acquisition program in the development phase?
	2. In your own words, can you describe the program re-baseline process?
	3. Can you describe the existing guidance for a program that wants to pursue the program re-baseline process?
	4. In theory, what is the objective of re-baselining a program?
	5. What do you consider a successful program re-baseline?
	6. Do you see any causes for programs having to re-baseline?
	7. In your opinion, does the re-baseline effort serve its purpose and is it effective?
	8. In your opinion, do the results for re-baselining a program justify the effort involved in the re-baseline?
	9. Can you list any issues or problems you may have with the program re-baseline purpose and process?
	10. Do you have any recommendations on ways or techniques to improve the program re-baseline process?
	11. Do you believe re-baselining a program is voluntary?
<b>Demographics</b>	12. What is your functional position?
	13. How long have you been working in the acquisition community?
	14. Can you give any recommendations for other individuals who I should interview?

The participants in this study were selected based on available contact information and functional position. The first step involved contacting either the

executive positions or human resource representatives within each organization.

Through this step, lists of PMs within each organization were provided for the purpose of requesting volunteers for this particular research effort. Each participant was asked to volunteer for the study through email and given a brief explanation of the purpose and confidentiality. Over the course of the study, individuals scheduled in-person interviews.

The researcher transcribed the opinions and exact thoughts of the interviewees throughout each interview. To limit biased transcriptions by the researcher, each interviewee was given the opportunity to review the transcriptions to ensure an accurate account of the interview. Once the data collection for each interview was complete, the entire transcripts were then processed into the spreadsheet for future analysis and theme building. Colleagues were asked to confirm the themes and patterns developed by the researcher as a sanity check and to ensure an accurate account of data analysis occurred. The themes and patterns that emerged throughout the data analysis process are described below in detail for each individual interview question and their corresponding research question.

### **Data Analysis**

Although variations can exist for data analysis, Creswell recommends a four step process (Creswell, 1997, Pitet, 2004). This spiral approach provides the most appropriate process to achieve desirable results. The interview data was processed through the following steps:

1. **Data Organization:** The data was organized using a database. Then the large responses were broken into smaller phrases or single words.

2. Perusal: Gather an understanding of the big picture concepts in the transcripts from the interviews. Then choose an interview and dissect its contents to determine the meaning underlying the substance.
3. Classification: After finding the inner meaning for numerous interviews, make a list of themes or topics and try to combine the similar topics. Patterns should begin to emerge during this step.
4. Synthesis: Combine and organize the data. Produce hypotheses or propositions that answer the research questions. Finally, build tables, diagrams, etc. to describe proposed relationships.

During data analysis, two techniques as recommended by Yin and Creswell will also be used (Creswell, 1994, Yin 2003). Pattern matching is accomplished by comparing the results of the four step process described above, and finding patterns that can be predicted from theory or guidance. Another technique for data analysis is termed explanation building. In this technique, the researcher tries to find links or explanations, either plausible or rival, and attempts to build a good explanation for the case. With the limited guidance and attempt to build theories, the analysis will focus primarily on building explanations and secondarily on finding patterns predicted from theory and guidance. After analyzing the data, the next step is trying to verify the research. Creswell discusses the need for a qualitative study to have a plan that addresses the validity and reliability (Creswell, 1994).

## **Other Considerations**

Although generalization, or external validity, is not a concern for this exploratory study, reliability and other validities will be addresses. Construct validity is best accomplished by establishing an operational set of measures. One technique recommends building construct validity by having colleagues and advisors review the report in its draft form during the data collection phase (Yin, 2003). Internal validity is addressed with the feedback process for transcribed interviews. This technique allows an interviewee a chance to ensure his/her answers were recorded accurately by the researcher (Merriam et al, 1988, Creswell, 1994). Even though this study cannot be precisely replicated, a very descriptive approach for data collection can enable this qualitative case study to be replicated at another Product Center or the Navy and Army (Creswell, 1994). However, a goal of case studies to establish reliability involves minimizing errors (Yin, 2003). In an attempt to increase reliability, the researcher has completely documented all procedures and processes for this study.

## **IV. Data Analysis**

### **Overview**

This chapter illustrates the analysis of the research effort. The chapter will be organized into two sections:

1. The demographics collected for this study, and
2. The results and analysis of data collection and the linking of responses to a specific research question.

The purpose of this research effort has three distinct objectives: identify the theory and clarify the guidance of program re-baselines, determine if individuals within the acquisition career field believe the program re-baseline process is effective, and finally, recommend any actions that will better serve program manager's relating to the re-baseline process. This chapter will discuss the views and opinions of program managers (PMs) and relate them to the investigative questions.

### **Demographics**

The PMs held a variety of positions that consisted of Air Force Officers and Air Force government civilians. The time in the acquisition career field ranged from 3 years up to thirty years. The varying degree of experience and expertise produced a large scope of data. The majority of participants, 78%, had worked on a program while going through the re-baseline process. This demonstrates the experience and credibility for each participant's responses. For the purposes of this study, categorizing and describing the various levels of PM positions would not provide additional insight to the research

effort and therefore was purposely left out. Confidentiality was maintained by the lack of demographic information requested during the interview process.

## **Data Analysis**

This section will be broken into four parts corresponding to each investigative question and the interview questions relating to each. To help illustrate the analysis, a table for each interview question is provided.

### **Investigative Question #1: What is the theory behind re-baselining a program?**

Questions four and five of the interviews provide responses that directly answer the first investigative question. For clarity, the analysis will be divided by the analysis for each interview question.

#### **Interview Question #4. In theory, what is the objective of re-baselining a program?**

For this question, two main themes were identified by participants. Expectation management as the objective for re-baselining a program was mentioned in 55% of the responses. Expectation management was described as the complete buy-in and understanding by all program stakeholders with respect to the program's current or updated situation. Today, a new requirement for PMs is the development and buy-in from the user community through the Expectation Management Agreement (EMA). This agreement is essentially an extension of the acquisition program baseline (APB) and serves as an avenue to declare and communicate expectations of all stakeholders throughout the life-cycle of the program. When the program witnesses a breach of one of the parameters, cost, schedule, or performance, a re-baseline enables the program office to communicate the changes and necessary change in management direction to the

stakeholders with an updated baseline and EMA, otherwise known as a program re-baseline.

An objective identified by 51% of the participants is to ensure the new program baseline is realistic and executable based on new funding, schedule, and requirements parameters. This response is consistent with the description in the DoD 5000 series. As mentioned above, when changes in one or more of the program's three parameters, cost, schedule, and performance occur, the old baseline does not match the current situation with respect to funding changes, schedule delays, and requirement changes. An executable baseline is one that enables a PM to perform or carry out what is expected of him as documented in the APB. The re-baseline process should help identify the problems and develop a "get well" plan with new cost estimates, schedules, and requirements definitions that give the PMs a realistic and executable program baseline to manage under these new constraints.

Two minor themes emerged and essentially both objectives share the same intentions; stabilize the program and provide a tool to bring the program's status back to green. The stabilization of the program response by interviewees was not considered similar to the development of an executable program baseline response because the purpose of stabilizing a program does not necessarily involve producing a realistic baseline. Stabilizing the baseline only ensures positive reporting up the chain of command, and alleviating a need to re-baseline in the near future, and may not include realistic and executable cost, schedule, and performance constraints. The ability to bring all cost and schedule variances back to zero indicates that the program is on track and no breach has occurred. As with the stabilization of a baseline, the resetting of cost and

schedule variances allows managers to report a program’s status as positive using the new baseline in the EVMS management tool.

Table 2 will present the data for the responses each participant gave corresponding to a theme. Due to the openness of the interview questions, several participants provided a response that corresponds to more than a single theme. Each theme mentioned by a participant was weighted equally thus providing results totaling more than 100%.

Table 2. What is the theoretical objective of a program re-baseline?

Themes	# of responses	% of participants	Total # of participants
1: Expectation Management	15	55.56%	27
2: Build a realistic & executable baseline	14	51.85%	27
3: Stabilize the program	4	14.81%	27
4: Bring program status back to green	4	14.81%	27

Interview Question #5. What do you consider a successful program re-baseline?

When interviewees were asked what a successful re-baseline effort meant to them, three themes emerged. A majority, 63%, identified a successful program re-baseline as an effort that produces a new, executable baseline within the updated cost, schedule and performance constraints. Creating and receiving stakeholder buy-in for the new baseline parameters was identified by 37% of the program managers interviewed. This correlates to producing an EMA with a clear understanding of the program’s future direction. The least identified theme for a successful re-baseline effort was creating a stable baseline. As mentioned above, the definition of a stable baseline for this study does not necessarily mean the creation of an executable baseline. A response of stabilizing the program simply states the desire to not go through the re-baseline process

for two or more years, as defined by interviewees, and a desire to have a positive reporting status to leadership. Table 3 below illustrates the breakout of the analysis.

Table 3. What is considered a successful program re-baseline?

Themes	# of responses	% of participants	Total # of participants
1: Created a realistic & executable baseline	17	62.96%	27
2: Created stakeholder approval and buy-in	10	37.04%	27
3: Created a stable program	5	18.52%	27

**Investigative Question #2: What is the existing guidance for program re-baselines?**

This investigative question will help determine if existing re-baseline guidance is known and utilized by program managers. The responses to interview question three will be analyzed and recommendations for the policy makers will follow in chapter five.

**Interview Question #3: Can you describe the guidance for program managers who want to pursue the re-baseline process?**

When asked, more than half of the participants declared they were not aware of any guidance and used a common sense approach for the re-baseline process. They then defined this approach as a number of steps generally involving: the identification of the cause for re-baselining; working with the user, higher level headquarters, and the contractor to develop a “get well” plan consisting of new budget estimates, schedules, and requirements definitions; and finally coordinate and receive buy-in from the decision authorities as well as the user community. Another 42% of the program managers described the guidance as stated in the DoD 5000 series as their main source of re-baseline direction. There were two other responses given during the interview as one PM stated that MAJCOM specific guidance was used when re-baselining a program and

another mentioned EVMS guidance. Table 4 illustrates the results of analysis for interview question three.

Table 4. Describe any program re-baseline guidance

Themes	# of responses	% of participants	Total # of participants
1: No. Used a common sense approach	15	57.69%	26
2: Followed DoD 5000 series guidance	11	42.31%	26
3: Followed other guidance	2	7.69%	26

**Investigative Question #3: Is re-baselining a program effective?**

The two interview questions that determined the effectiveness, based on the views of program managers, asked if the re-baseline effort served was effective, as well as if the effort involved in re-baselining a program was justified with the outcomes the process produced.

**Interview Question #7: In your opinion, does the re-baseline effort serve its purpose and is it effective?**

For the first question, an overwhelming response of all but one of the twenty seven participants thought the outcome of the re-baseline process did serve its purpose and was effective. Almost half also went on to state that it was effective at getting all the program stakeholders on the same page with the new direction and APB. A few program managers mentioned the effort to re-baseline a program was only effective if the cause of the APB breach was identified and a get well plan helped stabilize the program after the approval of the new APB by the MDA. The single participant who provided the “no” response described the frustrations encountered throughout the process and the results. This individual had to go through the re-baseline process a year after the first re-baseline,

thus building a negative view of the effectiveness of the re-baseline process. Table 5 illustrates the results for interview question seven.

Table 5. Is the program re-baseline process effective?

Themes	# of responses	% of participants	Total # of participants
1: Yes	26	96.30%	27
1a: Effective at getting stakeholder buy-in	10	37.04%	27
1b: If program's stable	3	11.11%	27
1c: Not sure about the purpose it serves	1	3.70%	27
1d: If original baseline is remembered	1	3.70%	27
2: No	1	3.70%	27

Interview Question #8: In your opinion, do the results for re-baselining a program justify the effort involved?

When the PM and their decision authorities determine a program re-baseline is the best solution for an out of control program, they understand the amount of effort and resources involved. For major acquisition systems, ACAT I programs, this can mean months or even years of continuous briefings and buy-in from stakeholders regardless of a particular stakeholder's stake in the program. A result is the lack of management attention devoted to the program's current issues while working through the re-baseline process. For smaller programs, the same percentages of resources may be exhausted, but the timeline usually doesn't reach those major programs. With this thought in mind, the PMs were asked if they felt the effort involved in re-baselining a program was justified with the outcomes the process produced. Over 90% of the participants believed the effort was justified based on the outcome of the re-baseline process. One individual had mentioned the negative experience while working on a certain program re-baseline effort

and felt the resources were not adequate and external people should be hired to help manage a program during the re-baseline process. The program manager also mentioned the lack of stakeholder buy-in after the process and felt the effort involved was not justified based on the results. Another PM felt that the effort involved may or may not be justified, depending on the success of the re-baseline process. Table 6 breaks down the analysis for interview question eight.

Table 6. Does the outcome of the re-baseline process justify the effort?

Themes	# of responses	% of participants	Total # of participants
1: Yes	24	92.31%	26
2: No	1	3.85%	26
3: Both, depending on the situation	1	3.85%	26

### **Additional Program Re-baseline Research**

The remainder of this chapter will analyze data collected for the interest of the researcher to gain a better understanding of the process and build recommendations for program managers and their management of a program during the re-baseline process.

#### **Supplemental Question #1: What causes a program to re-baseline?**

While future research will identify the exact causes of programs that re-baseline, interview question six asked program managers to list any cause of a program re-baseline they have witnessed.

#### **Interview Question #6: Do you see any causes for programs that have to re-baseline?**

Almost half of the participants identified broad causes of a re-baseline and others gave a more specific reason. Most program managers listed more than one reason they believed caused a program to re-baseline. The typical causes described by 48% of the

participants include cost overruns, schedule delays, and/or a change in performance requirements. Any one of these issues caused a parameter breach in the APB and thus caused the need to re-baseline. Roughly 19% of the program managers believed defense contractors caused the need to re-baseline based on three situations: the defense contractors proposed a low price to ensure being awarded the contract; overly optimistic defense contractor management that led to low contract proposals; and the inability of defense contractors to perform as agreed upon and expected by the government. Several program managers, 17%, described factors external to their control during their tenure as the PM, but controllable by the DoD, as the cause for a re-baseline effort. These factors include: funding instability or cuts; late government furnished equipment (GFE) for use on another program; and finally, reliance on other programs with relation to integration issues. It is widely known that due to the nature of our budget process, and the lack of control of world events, leadership from time to time must re-align funding and this usually leads to programs losing or gaining funds and the need to re-baseline based on budgetary changes. Late GFE and the reliance on other programs can also cause a program to delay its schedule. These situations are clearly out of the PMs control and a new baseline may be needed to communicate the program's current situation and way ahead. Also, during the process leading up to contract award, the government attempts to build reliable and accurate cost estimates.

Almost 8% of the participants felt poor government cost estimates caused the program to re-baseline. When technologies required for the system are not proven and program managers may not be able to predict future events, program managers believe

these initial cost estimates as another cause for program re-baselines due to the eventual breach of the cost parameters. Table 7 illustrates the analysis for interview question six.

Table 7. In your experience, what caused a program to re-baseline?

Themes	# of responses	% of participants	Total # of participants
1: Cost, schedule, & performance breaches	21	80.77%	26
2: Defense Contractor Issues	11	42.31%	26
3: Factors out of PMs control	9	34.62%	26
4: Poor cost estimates	5	19.23%	26
5: Poor understanding of requirements	5	19.23%	26

**Supplemental Question #2: Are there problems relating to the re-baseline process?**

This interview question attempts to shed light on concerns program managers have with issues relating to the re-baseline process. All but six participants described at least one concern with respect to the re-baseline process. As expected, several issues came to light.

**Interview Question #9. Can you list any issues relating to the re-baseline process?**

The most commonly mentioned concern, at 25%, is the lack of guidance and examples of a good re-baseline documentation package for program managers. However, several did mention there are no issues with the process and they also appreciate the flexibility when developing the re-baseline package for review by leadership and the user community. Program managers also voiced their concern regarding flexibility with respect to the timeline and resources available during the process. Currently a PM has ninety days to develop the get well plan once the breach has occurred. There are no exceptions, but also no repercussions if this timeline is not met. A program manager is expected to continue the normal management duties of the

program during the re-baseline process, but this process usually involves the use of resources not intended for the re-baseline effort. Some program managers were concerned that their inability to freeze the program and devote all their resources to the re-baseline effort limited the timeliness of the effort and accuracy of the cost and schedule estimates. The PMs believed the misunderstanding of other stakeholders about the re-baseline process caused the need to freeze a program during this process. Another concern voiced by PMs was the lack of education relating to the re-baseline process. They felt the need for an overview of the purpose and expectations during acquisition education would help with the uncertainties that arise during the process and would also clarify the situation the program office is put in to other stakeholders.

The last concern program managers have with the re-baseline process was the negative stigma that usually comes with the re-baselining of a program. It is commonly known that certain communities outside of the program feel program managers are simply trying to hide their mistakes by re-baselining a program and putting the status documentation back in the green for reporting purposes. This stigma usually stays with a program for some time and can produce negative feelings and/or poor communication channels between the program office and other stakeholders. Below, Table 8 presents the analysis of interview question nine.

Table 8. Are there issues relating to the re-baseline process?

Themes	# of responses	% of participants	Total # of participants
1: Lack of guidance and examples	7	25.93%	27
2: None	6	22.22%	27
3: More accountability and control for PMs	4	14.81%	27
4: Cannot freeze program during re-baseline	4	14.81%	27
5: Attempting to get stakeholder buy-in	3	11.11%	27
6: Stigma that re-baselining hides problems	3	11.11%	27
7: Other	3	11.11%	27

**Supplemental Question #3: Are there any recommendations for improving the re-baseline process?**

After voicing their issues with the re-baseline process, the participants were then asked to identify any recommendations they had that could improve the re-baseline process. Of the twenty seven program managers interviewed, 3 did not provide a response to this question. Below is the list of recommendations for improving the re-baseline process.

**Interview Question #10: Do you have any recommendations on ways or techniques to improve the re-baseline process?**

The main theme coming from interview question ten involves the recommendation that more guidance and a repository of successful re-baseline documentation should be made available to PMs either on a defense acquisition website or other means. Many participants voiced their frustration with the lack of broad guidance and expectations placed on them during the re-baseline process. The second most identified theme was the importance of changing the negative stigma of re-baselining a program. PMs felt this had to start at the top with leadership and flow down

into the lower ranks of the acquisition community. Another common theme voiced from the participants was their advice for all program managers to keep full and open communications with all stakeholders, especially the user representatives and higher level headquarters, during the buy-in portion of the re-baseline process. They believed this increased coordination would help speed along the process and give all stakeholders a clear understanding of the get well plan. Another theme mentioned was that program managers should keep the original baseline in mind during the re-baseline process; thus giving all stakeholders a better understanding of the initial intent of the program and a better understanding for the program's future. Although the recommendation to include re-baseline education in acquisition courses was only voiced by 3 of the participants, this approach could also affect other issues and recommendations as well. The affects of adding re-baseline education will be discussed later in chapter 5.

One theme developed during the data analysis process was matching the approval level of a re-baseline with the accountability level of a program. This means ensuring that the approval for re-baselining a program should only go as high up the leadership chain to match that of the accountability level for that program. Table 9 shows the analysis for interview question ten.

Table 9. Recommendations for improving the re-baseline process

Themes	# of responses	% of participants	Total # of participants
1: Add guidance and examples	11	40.74%	27
2: Change negative stigma of re-baselining	5	18.52%	27
3: Better coordination with stakeholders	3	11.11%	27
4: None	3	11.11%	27
5: Require original baseline be remembered	3	11.11%	27
6: Add education	3	11.11%	27
7: Other	2	7.41%	27

## **V. Results & Recommendations**

### **Overview**

The purpose of this research was to determine if program re-baselining was producing the results originally intended for an Air Force weapon system acquisition as prescribed by theory and guidance. A secondary goal of this effort, make recommendations to improve the process, was accomplished by reflecting on data obtained from the interviews and the literature review. This chapter will present conclusions from this research and offer recommendations for practitioners and future endeavors.

### **Conclusion**

The intended objective of this study was to gain an understanding of the re-baseline process and provide recommendations for improving the process within the Air Force. The secondary objective was motivation for future research into the purpose and effectiveness of re-baselines. It is the researcher's belief that both objectives were met and the acquisition community as a whole will greatly benefit from the findings and recommendations of this study.

The research question asked if the practice of re-baselining an Air Force acquisition program met its intended purpose as prescribed by theory and guidance. The participants felt that a purpose was met for re-baselining a program, but, based on the analysis, the purpose or objective could not be identified. The lack of a clear purpose and objective for program re-baselines led the researcher to make several recommendations to improve and clarify the process which will also clarify the desired outcomes. Based on this study, it has been determined that the two theoretical objectives of re-baselining a

program, as described by the program managers interviewed, are to manage the expectations of all stakeholders and produce an executable and realistic APB.

Likewise, the research problem stated an uncertainty to the effectiveness of program re-baselines. The uncertainty still exists because this study could not produce a clear definition to the purpose and objective of a program re-baseline. However, as mentioned above, this discovery of uncertainty has led to the recommendations that should clarify the purpose and effectiveness of the re-baseline process.

Along with clarifying the objective of program re-baselines, the participants believed more guidance is needed to aid the program managers when working through the re-baseline process. The Program Managers (PM) voiced their frustration with spending valuable resources trying to determine what the expectations were from all the stakeholders during and after the re-baseline process. Based on the analysis of the interviews, recommendations for practitioners have also been developed.

Over the course of the study, it became clear that some of the interview questions did not directly address the research question and therefore the analysis and results for those questions have been left out of this study. It is possible that future research efforts may find the data useful and therefore the questions, and their transcriptions, will be maintained.

As stated above, this is the initial study of program re-baselines and several factors were not taken into account that should be explored for future research efforts. More program managers from different Product Centers and Services would need to be interviewed to build a stronger case for changing the current acquisition culture with respect to the program re-baseline process. The results of this study should help improve

a process that in turn tries to provide a product to the warfighter as fast as possible under cost and schedule constraints.

### **Recommendations for Practitioners**

The following recommendations are primarily targeted towards those responsible for writing Air Force acquisition policy and also those responsible for conducting and maintaining acquisition education. However, these are recommendations and do not infer that any responsible organization is doing a poor job. The acquisition world is very complicated with countless laws and regulations that must be followed. Without those who write the policies, and teach program managers how to manage a program within the policies, the Air Force would not be where it is today. Based on the twenty seven interviews for this study, several key areas of improvement should be considered. The recommendations for practitioners is divided into three sections: education, guidance, and information dissemination.

### **Recommendations for Guidance**

Over half of the participants could not describe the guidance used when their programs went through the re-baseline process. Another 36% mentioned the limited guidance in the two DoD 5000 series documents as their main source of guidance. As discovered through the literature review, and through the data analysis of the interviews, it appears there is a lack of guidance with respect to program re-baselines. This section will discuss the researcher's recommendations for modifying, and adding to, the existing guidance. Keep in mind that several of the PMs interviewed preferred little guidance compared to an abundance of guidance relating to program re-baselines. However, a

majority also felt a lack of clarity and objectives exists in the current guidance documents.

The biggest issue raised during this research effort was the lack of understanding the objective for re-baselining a program. The two main thoughts from the program managers interviewed was that re-baselining helps manage expectations between all stakeholders and the re-baseline process helps build a realistic and executable baseline based on current changes and updates. Either Air Force or DoD level guidance needs to clarify the objectives for re-baselining a program. The current guidance states that a baseline is used as a control objective for the program (DoDD 5000.2, 2003). The researcher then inferred that the objective of a re-baseline effort is to regain control of the program's baseline with a realistic and executable APB. This added clarification will also help program managers understand what constitutes a successful re-baseline which also had conflicting responses from the interview participants.

The second concern echoed by interviewees was the lack of clarity on the timing and timeliness of program re-baselines. Guidance describes the need to re-baseline within 90 days of the parameter breach (DAG, 2004). The program managers interviewed did not understand why a time limit that is not enforced or punishable if not followed is in place when the main objective of the process is to regain control of the program with a realistic and executable baseline. When trying to determine the correct course of action and building of accurate and realistic estimates, a deadline only hampers the true purpose of the re-baseline process. Several PMs mentioned the inability to gather all necessary information and development of the "get well" plan within the required 90 days. With all this accounted for, there are three recommendations to help

clarify the timing of a program re-baseline. First, policy makers need to explore the realistic timelines for current and past program re-baselines and modify existing guidance to match a more realistic deadline. Secondly, a description of the penalties for not meeting the deadline needs to be added to make the program managers accountable. Finally, guidance should include some clarifications to the timing of a re-baseline. Specifically, whether a PM can begin the re-baseline process knowing a breach will occur in the coming months. If a program manager takes a proactive stance and tries to correct the problems before they occur, this decision should be rewarded. DoD guidance states that the breach must occur before the corrective actions, a new baseline, can be implemented. Clarification in the guidance, either at the Air Force or DoD level, needs to be included.

### **Recommendations for Education**

A concurrent research effort is looking at the effectiveness of acquisition education while this study specifically tried to gather information that will improve the program re-baseline process. After speaking with instructors at the Defense Acquisition University (DAU), and through the data analysis, it is clear that little or no acquisition education involves the teaching or guidance on how a PM should re-baseline a program and what is expected of the PM during and after the re-baseline process. With such a common occurrence, 21 out of 27 interviewed PMs having been a part of at least one program during the re-baseline process, it would be assumed that education is available to the program managers. However, program re-baselines education would not necessarily mean adding another course. There are three key areas that should be considered when developing re-baseline education: program manager's expectations;

desired outcome of the education; and what value does re-baseline education add.

Program managers have expressed in the interviews that it is not clear what is expected of them and most used a common sense approach when re-baselining a program.

Acquisition education needs to build upon the guidance in the DoD 5000 series, and DAG, by clarifying what the purpose of re-baselining a program is and what expectations the Milestone Decision Authorities (MDAs) and Assistant Secretary of the Air Force, Acquisition office (SAF/AQ) have in regards to a program re-baseline.

When asked what the objective of a re-baseline effort was, the PMs could not agree. The lack of a clearly defined objective for re-baselining a program could also be a reason why the programs go through more than one re-baseline effort throughout the program's life cycle and the process takes more resources and time than necessary.

Education needs to reiterate the objectives of re-baselining a program to the PMs. The desired outcome of the education should be the clear and defined expectations and responsibilities of the program manager during the re-baseline process, along with leadership expectations and clearly defined program objectives for the re-baseline process.

Another common thought discovered during analysis was the perception of a negative stigma placed on program managers from the acquisition and user communities if the PMs took their respective programs through the re-baseline process. It appears that this stigma is due to the lack of education and communication relating to program re-baselines since a majority of the program managers interviewed have experienced a re-baseline during their tenure. The perception is that a PM will decide to re-baseline in order to report positive status updates to the MDA and other stakeholders and not

because a breach or deviation occurred with one or more of the parameters in the Acquisition Program Baseline (APB).

The desired outcome of including education relating to program re-baselines includes: the clarification of expectations and responsibilities of the program managers during the process; clearly defined objectives of the re-baseline process; the gradual decay of the negative stigma associated with PMs who re-baseline a program; and more efficient re-baseline efforts with educated program managers who understand the expectations placed on them. Also, a feedback mechanism should be implemented to help determine if the education on re-baselines gave positive support to PMs that encountered a re-baseline effort after the education.

### **Recommendations for Information Dissemination**

The last issue raised during this research effort was the lack of consistent guidance with respect to documentation and expectations of the program manager during the re-baseline process. Several program managers that went through a re-baseline process mentioned the frustration of trying to find a good template for documenting and reporting the parameter breach in the APB. Instead of inserting templates and examples into the existing guidance, a program re-baseline repository should be developed on one of the defense acquisition websites. The repository should include examples of the documentation, timing of events, and the re-baseline process programs went through to get approval of the new APB. This could become the one stop shop for PMs trying to build their re-baseline package for approval briefings with stakeholders and the MDA. Even if this cannot be accomplished at the Air Force level, each Product Center can have their Acquisition Center of Excellence develop and maintain the documentation programs

went through during their respective re-baseline efforts. With these recommendations, program managers could develop the plans for the new baseline faster and with more clarity than before. This would allow the PMs to focus their efforts on the more important issues of the re-baseline process like new cost estimates and making trade-off decisions between the cost, schedule, and performance parameters.

### **Limitations**

The nature of case studies involves some inherent limitations. The three main limitations are: the inability to generalize with external validity; researcher bias; and finally a lack of rigor with respect to other research methods if systematic procedures are not followed (Yin, 2003). Another set of limitations arise from the use of interviews as a form of data collection. The main interview limitation is that interviewees may try to give the researcher what he or she wants to hear construing the results (Yin, 2003).

In case studies, biases occur and can produce poorly constructed questions. Also, the interviewee's response may be biased. To combat some of the bias issues in this study, several steps were taken. First, each interviewee was offered the chance to review the transcribed interview and make changes or corrections if needed. Secondly, the data analysis step was checked for biases by having another program manager analyze the data separately. Finally, the advising committee also checked for rational and unbiased analysis and conclusion building of the study.

### **Recommendations for Further Research**

Based on the results and recommendations of this study several possible areas of focus are available for future research. These other focus areas include: conduct a quantitative study on the effectiveness of program re-baselines; conduct a similar study

within the Army, Navy and other Air Force Product Centers; explore the views defense contractors have relating to the re-baseline process; explore the required practice of MDAs evaluating other design concepts and approaches after a breach has occurred according to the Defense Acquisition Guidebook; distinguishing the effectiveness of a program re-baseline based on the ACAT level of a program and/or which acquisition phase the program is currently located; determine if a program re-baseline is more effective in a single phase of the acquisition cycle; and finally, explore the effects an evolutionary acquisition strategy has had on the purpose and effectiveness of the program re-baseline process.

### **Summary**

The purpose of this study was to determine if the current practice of re-baselining a program was in line with the theory and guidance for the re-baseline process. Although practitioners, as a group, feel the re-baseline process is effective, they were unable to determine a single objective of the process. Through the literature review and interviews, valuable information was found that will one day improve the re-baseline process and provide a base for future research into the purpose and effectiveness of re-baselines. This will lead to a product for the warfighter that gets delivered faster and within the approved baseline. The ability to provide our users with the best technologies and capabilities the world has to offer will always remain the goal of every program manager.

## Bibliography

1. Abba, W. *How Earned Value Got to Primetime: A short look back and glance ahead*. Paper presented at the Project Management Institute Seminars and Symposium in Houston, TX. 2000
2. Chairman of the Joint Chiefs of Staff. *Joint Capabilities Integration and Development System*. CJCSI 3170.01E. Chairman of the Joint Chiefs of Staff. May, 2005.
3. Creswell, J. *Research design: Qualitative & quantitative approaches*. Thousand Oaks, CA. SAGE Publications. 1994.
4. Creswell, J. *Qualitative Inquiry and Research Design: Choosing among five traditions*. Thousand Oaks, CA. SAGE Publications. 1997.
5. Data and Analysis Center for Software. *Track Earned Value*. Gold Practice Document Series. DACS GP-29 v1.2. Retrieved August 2, 2005, from [http://www.goldpractices.com/download/practice/pdf/Track\\_Earned\\_Value.pdf](http://www.goldpractices.com/download/practice/pdf/Track_Earned_Value.pdf)
6. Department of Defense. *Defense Acquisition Guidebook*. Retrieved August 1, 2005, from <http://akss.dau.mil/dag/DoD5000.asp?view=document>
7. Defense Acquisition University. *Introduction to Defense Acquisition Manual*. Fort Belvoir, VA. Defense Acquisition University Press. November, 2003.
8. Defense Systems Management College. *The Acquisition Program Baseline*. DSMC Fact Sheet 1.5.2. March, 1997. Retrieved August 3, 2005 from <http://akss.dau.mil/docs/Chapter%206.doc>
9. Drezner, J., Jarvaise, J., Hess, R., Hough, P., & Norton, D. *An Analysis of Weapon System Cost Growth*. MR-291-AF. Santa Monica, CA: RAND Corporation. 1993.
10. Eisenhardt, K. *Building Theories from Case Study Research*. Academy of Management Review, Vol. 14, No. 4. 532-550. 1989.
11. Fleming, Q., & Koppelman, J. *The Earned Value Body of Knowledge*. Paper presented at the 30<sup>th</sup> Annual Project Management Institute 1999 Seminars & Symposium in Philadelphia, PA. October, 1999.
12. Locke, L., Spirduso, W., & Silverman, S. *Proposals that work: A guide for planning dissertations and grant proposals*. 2nd ed. Newbury Park, CA. SAGE Publications. 1987.

13. McNutt, R. *Reducing DoD Product Development Time: The role of the Schedule Development Process*. MIT. 1998, pp 293.
14. Merriam, S. *Case study research in education: A qualitative approach*. San Francisco, CA. Jossey-Bass. 1988.
15. National Airspace System Configuration and Evaluation Staff. *FAA Program Baseline Instability: Causes and Recommended Corrective Actions*. Report #2000-10. FAA. February, 2000. Retrieved November, 9, 2005 from <http://www.faa.gov/acm/acm10/reports/Instability>
16. Petit, C. *Development of measures of success for corporate level air force acquisition initiatives*. Air Force Institute of Technology, Wright-Patt Air Force, OH. 2004.
17. President's Blue Ribbon Commission on Defense Management. *A Formula For Action: A Report to the President on Defense Acquisition*. The Packard Commission Report. Washington: GPO, June 1986.
18. Reig, R.W. *A Decade of Success and Failures in the DoD Acquisition System: A continuing quality journey*. Program Manager, pp 27-29. January-February, 1995.
19. Searle, D.A. *The Impact of the Packard Commission's Recommendations on Reducing Cost Overruns in Major Defense Acquisition Programs*. Master's Thesis. Wright-Patterson AFB, OH: Air Force Institute of Technology. 1997.
20. Under Secretary of Defense Acquisition, Technology & Logistics. *DoD Directive 5000.1: The Defense Acquisition System*. Department of Defense. Washington: GPO. May, 2003
21. Under Secretary of Defense Acquisition, Technology & Logistics. *DoD Instruction 5000.2: Operation of the Defense Acquisition System*. Department of Defense. Washington: GPO. May, 2003.
22. United States Congress. *US Code Title 10, 2435*. Washington: GPO, March, 2004.
23. United States General Accountability Office. *Information for Congress on Performance of Major Programs Can Be More Complete, Timely, and Accessible*. GAO-05-182. Washington DC: GPO. March, 2005.
24. Yin, R. *Case Study Research, Design and Methods*. (3<sup>rd</sup> ed). Newbury Park, SAGE Publications. 2003.

<b>REPORT DOCUMENTATION PAGE</b>		<i>Form Approved</i> <i>OMB No. 074-0188</i>
<p>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p> <p><b>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</b></p>		
<b>1. REPORT DATE (DD-MM-YYYY)</b> 23-03-2006	<b>2. REPORT TYPE</b> Master's Thesis	<b>3. DATES COVERED (From – To)</b> August 2004 – March 2006
<b>4. TITLE AND SUBTITLE</b>  Acquisition Program Baselines: Theory & Practice		<b>5a. CONTRACT NUMBER</b>
		<b>5b. GRANT NUMBER</b>
		<b>5c. PROGRAM ELEMENT NUMBER</b>
<b>6. AUTHOR(S)</b>  Suarez, Troy, A., Captain, USAF		<b>5d. PROJECT NUMBER</b>
		<b>5e. TASK NUMBER</b>
		<b>5f. WORK UNIT NUMBER</b>
<b>7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)</b>  Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/EN) 2950 Hobson Way WPAFB OH 45433-7765		<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>  AFIT/GRD/ENV/06M-11
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>  N/A		<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>
		<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>
<b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b>  APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.		
<b>13. SUPPLEMENTARY NOTES</b>		
<b>14. ABSTRACT</b>  The United States Government requires every program manager in the Department of Defense to document program goals prior to the initiation of an acquisition program. According to the Defense Acquisition Guidebook (2005), an Acquisition Program Baseline (APB) satisfies this requirement. Updating the APB, also referred to as re-baselining, may also be required during the execution of an acquisition program. Although guidance is available for the initial production of a program baseline, scarce information on the guidance and theoretical purpose of a program re-baseline exists. The research presented in this thesis investigated the purpose and effectiveness of program re-baselines through interviews with twenty seven program managers from the acquisition community. An analysis of the data collected during the interviews, combined with an extensive review of the current literature, led to recommendations in the areas of improved guidance, practice and education. Specifically, it was revealed that the purpose of a re-baseline varies depending on an individuals past experiences with a re-baseline activity. In addition, this research revealed that a majority of program managers have participated in a program re-baseline during their careers, which magnifies the importance of clarifying the expectations and objectives of program re-baselines for those entering the acquisition profession.		

<b>15. SUBJECT TERMS</b> Acquisition Program Baselines, Re-baselines, Program Breach, Program Baseline Deviation, Re-baseline Effectiveness					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>  UU	<b>18. NUMBER OF PAGES</b>  59	<b>19a. NAME OF RESPONSIBLE PERSON</b> Sonia E. Leach, Major, USAF (ENV)
a. REPORT  U	b. ABSTRACT  U	c. THIS PAGE  U			<b>19b. TELEPHONE NUMBER (Include area code)</b> (937)255-3636, x7390 sonia.leach@afit.edu

**Standard Form 298 (Rev. 8-98)**  
Prescribed by ANSI Std. Z39-18

	<i>Form Approved</i> OMB No. 074-0188
--	--