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DEFENSE SYSTEMS MANAGEMENT COLLEGE

PROGRAM MANAGEMENT COURSE

INDIVIDUAL STUDY PROGRAM

HOW TO GET THE MOST FROM
THE COST/SCHEDULE CONTROL SYSTEM CRITERIA

STUDY PROJECT REPORT
PMC 76-2

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: HOW TO GET THE MOST FROM THE COST/SCHEDULE CONTROL SYSTEM CRITERI

STUDY PROJECT GOALS:

To identify, discuss and evaluate the successes and failures encountered in using a validated C/SCSC System in managing the joint ARMY/NASA Rotor Systems Research Aircraft (RSRA) Project.

STUDY REPORT ABSTRACT:

This report provides lessons learned in the use of a management system validated under the Department of Defense Cost/Schedule Control System Criteria (C/SCSC) in the management of an aircraft development program. These lessons, based on the author's experience as the Deputy Program Manager, indicate that the success of such a system is dependent upon management support of the system, use of the system by the technical managers, training of the technical managers in its use, and tailoring the reports to the needs of the technical managers.

SUBJECT DESCRIPTORS: Research and Development
Project Management
Management Techniques

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HOW TO GET THE MOST FROM

THE COST/SCHEDULE CONTROL SYSTEM CRITERIA

Study Project Report

Individual Study Program

Defense Systems Management College

Program Management Course

Class 76-2

by

Robert Letchworth
LTC USA

November 1976

Study Project Advisor
Mr. Arnold G. McManamon

EXECUTIVE SUMMARY

This report provides some lessons learned in the use of a management system validated under the Department of Defense Cost/Schedule Control System Criteria (C/SCSC) in the management of the joint Army/NASA Rotor Systems Research Aircraft(RSRA) Project. Based on the RSRA experience it has been demonstrated that such a system can provide the necessary information to government program offices for effective and timely participation with the contractor in the management of their programs. During the design phase of the project several techniques used by the RSRA Project Manager optimized this participation. These techniques are worth consideration for use on other programs. First, the government's technical monitors were designated as managers and were held accountable for the cost, schedule and technical status of their area of responsibility. Second, the contractors internal management system was used and each of the government's managers were trained in the mechanics and methods of its use and in the various techniques of analysis of the output data from the system. The reports provided by the contractor were tailored for the technical managers' use rather than the specified government formats that are generally received. Third, the use of performance indicies proved to be the best method of tracking and communicating performance. These indicies are simply a measure of the hours actually spent for each hour of effort planned.

The effectiveness of the system deteriorated to almost worthlessness during the fabrication phase of the project and was due to the contractor's managers not believing nor using their own system even though the indicators were pointing to the true problem areas. It became apparent

that the contractor's management system was a system that was created to satisfy the government's C/SCSC requirement. The system provided a status of cost, but it was not used as a means of control. Thus the system was almost useless. The lesson learned is obvious. The worth of any management system is dependent upon its support and use by the managers.

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INTRODUCTION

Although project management is an art and the application of "cookbook" solutions to problems may not always be appropriate or effective, it is helpful to try to understand what methods and techniques have proven effective on other programs, and to try to adapt the appropriate ones to new programs. It is a well known fact that the problems most major programs have experienced are not unique. In fact, each new manager keeps hoping his program will be different, but in the end he stubs his toe on the same rocks that countless managers before him have stubbed theirs. Therefore, the prudent manager should try to be aware of as many of these rocks as he can and plan for them by trying to mold his program by adapting the techniques that have proven most effective on other programs. The purpose of this paper is to provide some important lessons learned and techniques used in the management of a joint Army/NASA aircraft development program which used a management information system validated under the Department of Defense Cost/Schedule Control System Criteria (C/SCSC). Both successes and futures will be addressed. It is hoped that some of the methods described will be helpful to others involved in this dynamic field of program management and who are interested in getting the most out of C/SCSC.

COST/SCHEDULE CONTROL SYSTEM CRITERIA

In an attempt to keep from imposing a system of management on defense contractors during the acquisition of major weapons systems, The Department of Defense has issued DOD Instruction 7000.2 which allows the use of the contractors internal system of management provided it meets certain management criteria called the Cost/Schedule Control System Criteria (C/SCSC). These criteria deal with the organization to do the work; the planning and

budgeting of the work; the accounting for the effort expended and work accomplished through performance measurement; the analysis of the performance to plan; and revisions to the plan for adjustments due to performance and other changes; and government access to plans, changes and performance data. If the contractor's management system satisfies these criteria, the government has reasonable assurance that the contractor's system is based on sound fundamental principals of management and that he will manage the program well. But, has C/SCSC provided this good management? Some people believe it has, while others criticize it strongly. Two of the most common criticisms are listed below and are valid when taken from the point of view of those making the criticism:

Timeliness of Reports. The C/SCSC reports received by the program office are too old to be used in effective day-to-day management of a program. In general the reporting procedures are such that the contractor receives his internal status reports 3 to 7 days after the end of a reporting period. He then analyses the variances of his performance to plan to identify problems, find solutions, and assesses their impacts on the program. He then finalizes the reports and submits them to the government. These reports are usually received from 30 to 45 days after the close of the accounting period. Thus, the data in the report can be as much as 75 days old by the time the program office sees it. This long delay makes questionable the utility of these reports for use by the program office in identifying, understanding, and solving problems. To wait that long to find out about a technical problem which the government needs to know about or could have provided assistance in the solution would be catastrophic. Similarly, minor problems can become very costly if they go

undiscovered for several months. Thus, the monthly Cost Performance Reports are generally criticized as being of little value to the technical side of the program office and other methods are generally used to track technical performance.

Although a C/SCSC system is truly not the best tool for identifying major technical problems or "show stoppers" (usually one doesn't have to look for these) the lessons learned in the Rotor Systems Research Aircraft (RSRA) Project Office show that a C/SCSC system can be a very helpful tool in assisting the technical managers in identifying and solving technical problems. The key to the utility of such a system, as will be discussed later, is tailoring the reporting to the program's needs.

Difficult to Understand and Use. The idea of performance measurement sounds good, but in trying to plan for it, measure it, analyse it, and report it, there evolves a system of procedures, definitions, and analytical techniques that are difficult to understand; i.e., it develops its own cult. Not only is there a potential lack of understanding within a program office, but this potential exists at all management levels above the government's and the contractor's respective program organizations. This lack of understanding, coupled with the suspicions that a large number of managers have toward the accuracy and worth of "Automated Management Information Systems" can create both communications and credibility problems. The requirement that the system and its reports be understood in order to be used effectively, force some managers to turn the system, its reports, analyses, and problems over to the "experts" who are generally the financial managers in the government's organization or the accountants in the contractor's organization. Thus, a great deal of effectiveness in management control is lost because of a lack of understanding.

The RSRA project office was relatively successful in ensuring a good understanding and use of the C/SCSC within the project office. However, it was not very successful in developing an understanding and in communicating with the levels of government management above the project office. The contractor failed within his own organization to provide an understanding of and use of the system at the higher levels of program and functional management. These significant points will be discussed in greater detail below.

THE RSRA AND C/SCSC

The Rotor Systems Research Aircraft (RSRA) Project is a joint Army/NASA project to design, fabricate, flight qualify, and bring into operation two research helicopters to be used for improving rotorcraft prediction methodology and for testing new rotor concepts. The project is funded, manned, and managed on a 50-50 basis between the NASA and the Army. In the jargon of joint programs, NASA is the executive agency and the Army is the participating agency. The dollar value of the project does not approach the threshold specified in DODI 7000.2 for a mandatory C/SCSC requirement. However, the firm winning the competition had just recently had its management system validated under C/SCSC and proposed that it be used on the RSRA project. This proposal was in line with the project office's stated objective to minimize special reports from the contractor by using his internal systems, methods, and reports.

Reports. The normal C/SCSC cost performance reports required by DODI 7000.10 were not requested. Instead, the contractor provided the same internal documents he used. The level of the reports provided was contractually set at level three of the contractor's Work Breakdown

Structure (WBS), and level three of the functional organization. It was further stipulated that if problems developed, reports to the lowest level would be provided, as necessary, for proper visibility and management. After much discussion, the contractor agreed to mail the raw monthly computer status reports when they became available which was 3 to 5 days after the close of the accounting period. By the 20th of each month the contractor was required to provide a financial report which in essence was the contractors analysis of progress vs plans, analysis of the significant variances revealed in the basic status reports previously submitted, and an assessment of the impact of problems revealed and/or actions taken. However, these analysis reports were usually 10 to 15 days late and were of little value. In addition to these contractually agreed to monthly reports, the government's in plant resident engineer forwarded the mid-month computer reports to the project office the day they were available. The fact that the project office was receiving the basic reports twice a month and only 5 to 10 days after the close of the accounting periods, provided the capability for each of the government's technical managers to track the cost, schedule, and technical performance of their WBS elements in an integrated and timely fashion. Three other factors supported the effective use of these documents. These were (1) the project office staffing of a government manager counterpart to each of the contractor's managers, (2) the effective training of the government's technical managers in the contractor's management system, and (3) the technique of holding the government managers accountable for the cost and schedule condition as well as the technical condition of their WBS elements.

Accountable Managers. The fundamental and key management technique used

within the government's project office was to make each of the WBS managers accountable for cost, schedule and technical performance. Each month each WBS manager was required to brief the project senior staff on the cost, schedule, and technical status of his area. Reasons for deviations from plan had to be explained and potential solutions and impacts identified. Finally, each manager was required to provide and defend his assessment of the Estimate At Completion (EAC) for his area. On occasion, a manager would find that he had the "Monkey" on his back; i.e., that he was responsible for one of the Top Ten Problems. In such instances he was in the "center ring". In addition to a weekly report to the project senior staff on cost, schedule, and technical status of the solution to the problem, he was required to brief the next level of Army and NASA management. Although some of the engineers were inherently better managers than others and were quicker to grasp the cost and schedule aspects of their tasks, all became sensitive to these two factors which most had not been required to consider before. I firmly believe that this delegation helped create an involved, dedicated, and highly effective team of government and contractor managers during the design phase of the project.

The 60 Day Planning Period. One of the most beneficial management actions taken at the start of the contracted effort was the 60 day planning period. This 60 day period began just after contract go ahead. The contractor was not allowed to proceed with any of the preliminary design, but was restricted to developing the detailed plans for the program. All Cost Accounts Plans (CAP) for the entire project and the first 6 months of work packages were planned. Staffing

and organizing the contractor's and the government's respective project offices took place at this time along with a concentrated training program for all contractor and government WBS managers in the contractor's management control system. For each of the level three WBS elements, the contractor assigned a WBS manager to be responsible for the cost, schedule, and technical effort. As previously stated the organization of the government's project office was a mirror image of the contractor's organization with a counterpart government WBS manager for each level three WBS element. Each set of managers and other contractor and government project management personnel attended the eight hour a day, five day training course covering the description, mechanics, and use of the contractor's management control system. This enabled all parties to understand the specifics of the methods of planning, scheduling, budgeting, authorizing work, accounting, reporting, analyzing, and developing changes and work around plans. Everyone spoke the same language and understood the functions and uses of the planning documents and various reports. Nothing was lost in the usual translation when information is put into "Government's Format". The effect was increased efficiency and communications since it enabled all concerned to concentrate on the solutions to problems instead of trying to understand what was really being said in reports or briefings.

One of the major outputs of the 60 day effort was the procurement plan. I feel this planning and its subsequent implementation provided an early identification of and solutions to procurement problems. During the initial stages of the design, the designers were almost "harassed" by the procurement personnel to identify the components and material

that would have to be purchased. The intent was to identify, order receive, and store the material and parts needed for the RSRA. This emphasis on procurements was an attempt to correct one of the contractor's historically weak areas. This approach to procurements is highlighted here to point out that such an effort will usually be required to get procurements under control early. C/SCSC systems are not very helpful in this regard since the accounting methods used for accruing costs under the C/SCSC is usually point of usuage; i.e., costs are charged when the material is consumed. Problems of cost overruns for procurements or problems due to lack of parts or material can be best identified and solved, or at least accounted for long before they appear in the cost performance reports.

Another management action taken by the contractor's project manager during the 60 day planning effort was the establishment of a large management reserve. Historically for this contractor such reserves were approximately 5% of the contract target cost. In this instance a 15% reserve was established. The intent was to establish tight targets that, if achieved, would enable the contractor to maximize his cost incentive fee for this cost plus incentive fee contract. Initially this approach was appealing to both the governement and the contractor, however, it later became apparent that the targets were too restrictive and they lost their effectiveness as management goals since they were impossible to achieve. In reality, a reverse effect developed. The reduction of resources to establish the management reserve became an excuse for the early cost variances that appeared; thus, the identification of the true causes of these early cost problems was delayed.

MANAGEMENT OF COST PROBLEMS

Reports, Charts, and Techniques. During the design phase, the government WBS managers used the contractors cost performance reports to good advantage. The feature that made the reports most useful was the break out of costs into the various elements of costs. Specifically the listing of Engineering and Manufacturing planned cost (BCWS), actual costs (ACWP), and performance (BCWP) in hours in addition to dollars was very useful for technical management. This listing of hours is contrasted to the usual cost performance reports that show performance in dollars only. Being able to track design and manufacturing performance in hours eliminated the usual problems of trying to separate the effects of rates and overheads from the true technical performance. In fact, the data on the reports was sufficient to allow each WBS manager to pinpoint all the causes of variances, i.e., poor design or manufacturing performance, labor rates differentials (skill levels), overhead rates, material cost variances, or the variances in the cost of other direct changes.

The sample cost/schedule performance report on page 19 shows a typical report for one of the WBS elements. The report can be divided into two main sections. The lower portion, consisting of the lower six rows, provides the total dollar summary information for each of the lower level WBS elements that make up this WBS element. The upper half of the report consists of 10 rows of data which summarize the various elements of cost for the WBS element. These rows are further subdivided into three column sections: (1) "Current Period" showing the last 15 days performance, (2) "Cumulative" showing total or cumulative

performance to date, and (3) "At Completion" showing the total budget, the estimate at completion (EAC), and the cost variance at completion. With these reports each RSRA manager was able to evaluate cost/schedule performance twice a month using any of a number of the standard C/SCSC analytical techniques and formulas. As previously mentioned, the breakout of data by cost category is such that performance could be evaluated in a variety of ways such as (1) Salary (Engineering) hours, dollars, and overhead; (2) Hourly (Manufacturing) hours, dollars, and overhead; (3) Material dollars; (4) Other Direct Charges (ODC) dollars; (5) Total hours; and (6) Total dollars. Also, by dividing the salary and hourly dollars shown by their respective hours the labor rates could be determined. These rates provided a measure of the skill level variations when the actual rates were compared to the planned rates.

From these reports each manager developed various tracking charts, three of which are shown on page 20. The top chart, "Cost/Schedule Performance Versus CAP Plan", shows four plots. The first is the time phased cumulative distribution of the total budget for that WBS element and is the WBS budget baseline. It is the summation of all Cost Account Plan (CAP) budgets for that element. The other three plots are the Budgeted Cost for Work Schedule (BCWS) which represents the day to day planning or the performance baseline, the Budgeted Cost for Work Performed (BCWP) or performance to date, and the Actual Cost for Work Performed (ACWP) or actual costs to date. The schedule variance shown in this case is approximately -$200K (BCWP - BCWS) or $200K behind schedule. This variance as measured can be misleading if the BCWS or performance baseline does not coincide with the WBS budget baseline. This is obviously the case on this chart.

The performance baseline, BCWS, is lagging behind the budget baseline by $400K. This difference shows that the day to day planning for this element is $400K behind the master schedule which is reflected in the budget baseline. As discussed earlier the performance to date (BCWP) is $200K behind the day to day plans. Thus, this element is really $600K behind the master schedule or budget baseline. The point to be made is that one must thoroughly understand the contractor's system to insure there are no misunderstandings. Reported schedule variances can be misleading and should be compared with other working schedules or networks.

The middle chart "Schedule Status" is a plot of the number of weeks behind or ahead of schedule. The two weeks behind schedule status shown represents only the $200K schedule variance measured from the performance baseline.

The bottom chart "Performance Index History" plots the contractor's cumulative performance index for total hours. This index is computed by dividing the total actual hours expended (ACWP) by the total hours credit received for work performed (BCWP). In the simplest terms it is a cumulative average of the hours spent for an hours worth of work completed. This particular plot shows that for each hours worth of work accomplished it has taken 1.15 hours to do that work. The technique of using performance indices is not new, but it does provide a simple and effective method to track and manage by. It is especially useful in communicating with individuals who do not understand the definitions and methods associated with a C/SCSC system of reporting. It should be noted that the performance index method can also be used with dollars, however, in the case of the ROTA project, indices in hours were more meaningful since the main issue was performance with

respect to hours not rates or overhead issues. The use of performance indices became the major technique used for tracking performance during the fabrication phase of the project when WBS management was replaced by functional management. The charts on pages 21 thru 24 are plots of performance indices of the most cost significant functional areas for the RSRA program. The problems depicted in manufacturing, page 23, will be discussed in detail later.

The Change To Functional Management. Toward the end of the design phase and during the transition to manufacturing (from November 1974 thru January 1975), it became apparent that the contractor's WBS managers were in fact managers for the design phase only. The impression that they would also manage the fabrication and test phases had been implied in the contractor's proposal and reinforced during the initial staffing and management of the design phase. This implied program form of management was evidently the contractor's response to the government's desire to have an "experimental shop" type program even though it was contrary to their method of management. This contradiction became evident during the transition to manufacturing when the contractor's WBS managers became ineffective in interfacing with the government's WBS managers on matters of tooling, fabrication, assembly, and integration. Although they had signature responsibility for the various plans it was only a formality. The functional Operations Department, which was responsible for these areas, was quick to restrict the interference of the engineers in their domain. Their attitude was essentially, "Get out of our way and let us build the aircraft". When it became evident that the contractor's project manager was not interested in increasing the control authority of the WBS managers, as evidenced by his desire to release the majority of them from the program

since their functional jobs as design leadmen were over, the government's program manager was faced with the decision of trying to force the contractor to manage in a way foreign to his normal method; or re-orient the government's office to monitor and manage the way the contractor managed. The decision was made to adjust the government's office to reflect the functional management of the contractor. The government WBS managers were still responsible for the total effort in their areas, but they were required to work closely with newly designated Operations and Test Managers in the governments organization. The Operations Manager was given the overall responsibility for manufacturing and manufacturing engineering (tooling) and the Test Manager was given the responsibility for component, subsystem, ground, and flight testing. The WBS managers became the technical "fire brigade" for the solutions to problems that surfaced in the operations or test areas.

During this transition to manufacturing, the contractor's cost performance reached the point that the contractor's remaining management reserve would be required just to offset the established 15% engineering design and 17% procurements overrun. Manufacturing and testing were yet to come! What was even more alarming was that the initial manufacturing hourly performance indices (page23) were at an alarming high of 1.26 as of December 1974. The contractor, however, kept insisting that although he had established a large overrun to date the high performance indices in manufacturing would disappear and that he had a good chance of underrunning the manufacturing effort and in addition, he would perform at the planned level in the test phase. Thus, began the period of challenge and confrontation with the contractor.

The Key is Management Support. In January 1975, the government's project manager briefed the Department of the Army and NASA Headquarters on the status of the RSRA project. By that date the government was in the process of committing most of its management reserve to solve two major technical problems and the contractor's remaining reserve would only offset his established overrun. The point was made that the key to a project cost overrun was the contractor's performance for the remainder of the contract. In addition, the Operations' performance indices of December 1974 reflected an alarming high of 1.26. Both headquarters were assured that the project offices' primary task would be to maintain pressure on the contractor to improve his performance to the level he said he could achieve; i.e., an index of 1.00. The January reports were very encouraging with an index of .95, but by March the trend became unfavorable again and by May the index was at 1.27. Additional pressure was brought to bear on the contractor to investigate whatever problems he was having, solve them, and improve his performance or provide the project office an assessment of the problems and an estimate at completion so that the government could take whatever action that might be required.

The response by the contractor was not expected. His reply was that the indices were wrong and that he had built many helicopters in the past and he would build the RSRA for the hours budgeted. The contractor contended that the main reason for the poor performance to date was the outdated plans that were loaded into his management information system. This made little sense to the government project office, so the government's Airframe WBS manager was tasked to conduct a detailed analysis of his area to determine if there was or was not a real problem in the manufacturing area.

The WBS Manager conducted a very detailed analysis of the contractors performance on the Basic Structure (Level 4). The data were analyzed and on site investigations were conducted down to work package level. The results shown on page 25 were alarming. If this performance continued then a $1,093,000 cost overrun could be expected on the basic structure alone. What was causing this poor performance?

The analysis uncovered several technical problems which were corrected and did save some costs later on. Four of the more significant ones were (1) a significant level of engineering changes which were not being controlled, (2) the discovery of blind riveting problems which NASA was able to help the contractor solve, (3) quality control inspection problems that were allowing defective parts to be incorporated into sub-assemblies before they were discovered, and (4) a discovery of 600 hours of mischarges, i.e., people working other programs and erroneously charging to the RSRA. This analysis points out the worth of a C/SCSC system as a tool in assisting in the identification of technical problems that might go unnoticed over a period of time. An analogy can be made to the individual who draws advance travel pay and goes on TDY for several days. The last day when he goes to pay for his room he is surprised to find that he doesn't have enough money and must use a credit card. He wonders what happened to all the money he had. Had he planned to spend so much each day for room, meals, and incidentals, and checked his actual expenditures against this plan each day, he would know whether or not he would be overrun the last day. The ability to see this day to day accumulation of cost overrun is where C/SCSC can be very effective, and an analysis of it can turn up some significant technical problems that are solvable, but would otherwise not rise to the level of

being a "show stopper".

The major cause of the poor performance, as assessed by the government's WBS manager, was not due to the technical problems listed above, but due to poor planning. This poor planning was not in the same context as reported by the contractor. The basic problem was that the resource plans were understated and in order to perform the required work it would take the additional $1,093,000 for the basic structure, i.e., the performance was real and a cost overrun was materializing.

The results of this analysis were briefed to the contractor's project personnel and they were asked to conduct their own analysis of the situation and provide an assessment and their recommendation as to what course of action should be taken.

The contractor, led by the Senior Vice President for Programs, supported by his Project Manager, presented their analysis at a joint contractor/government review. The contractor maintained that the data and the government's assessment were wrong and that they would build the RSRA for what they had planned. They further indicated that their validated system was merely an accounting system and not a control system. Several of the key managers including the Operations (Manufacturing, Tooling, and Procurement)Manager acknowledged that they did not use the system. It was obvious that the Project Manager and the Senior Vice President did not either. The result was that no action was taken at the time when it might have made an impact. The overrun continued to grow and at this writing as manufacturing draws to a close, a year and a half later, the manufacturing overrun at Level 1 is $2.5 million.

The major point to be made here is that regardless of how good a tool

the system may be, if it is not used or if it is not supported by management, it is of little use. In fact, it is almost worthless.

SUMMARY

Looking back over the successes and failures experienced on the RSRA project, there are several key lessons that should be useful to program managers in getting the most out of C/SCSC. The first and most important is the use and support of the system by the government's and contractor's program managers. Without the support of management the system is worthless. This is especially true if the contractor is only satisfying a government requirement by implementing C/SCSC as was evidently the case with the RSRA contractor. Second: The technical managers should be held accountable for cost and schedules as well as technical performance. This technique provides the motivation and sense of responsibility required for good technical management. Third: The system and its reports should be tailored to the specific needs of the program office for use as management tools by technical managers and not solely as a historical document for the financial groups within the program offices or for higher headquarters. If performance status can be obtained in hours in addition to dollars the reports will be more useful. Fourth: If possible, use the contractors internal system and have the government program office convert the data to the government formats required by higher headquarters. In any case, train the technical managers in the management system being used. Fifth: The use of performance indices provides an outstanding and simple method of tracking and communicating performance measurement. Sixth: Effective and early control of procurements can not be accomplished with a C/SCSC system. Another system must be employed. Seventh: If at all possible a 30 to 60 day planning

period at the beginning of the contracted effort where the contractor is forced into a concentrated phase of planning should be used. This is well worth the time and money.

PROGRAM AMIMIAD

SPOTS
COST/SCHEDULE PERFORMANCE REPORT

REPORT DATE 13 JAN 76

PROGRAM: RSRA

WBS ELEMENT SUMMARY

WBS NO 11A1 BASIC STRUCTURE
LEVEL 4

PERIOD ENDING 31 DEC 75 MANAGER DIPIRO, J

SCHED OPEN 01JAN74 EST OPEN 01JAN74 ACTUAL OPEN 01JAN74 SCHED COMP 31JUL76 EST COMP 31JUL76 ACTUAL COMP

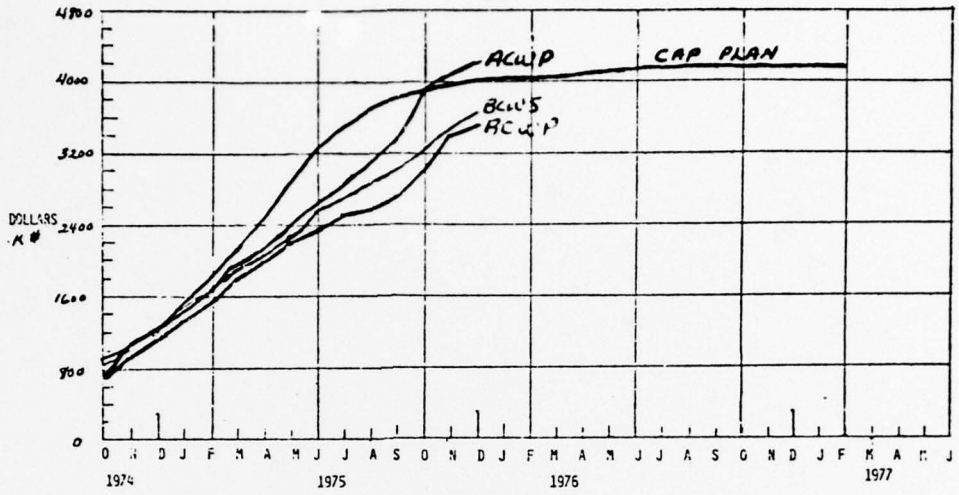
	CURRENT PERIOD					CUMULATIVE					AT COMPLETION				SIGVAR
	BCWS	BCWP	ACWP	SVAR	CVAR	BCWS	BCWP	ACWP	SVAR	CVAR	TOTAL MP/PDS	BUDGET CAP	EAC	CVAR	
SAL HR	483	323	0	(660)	323	107066	106549	97563	(517)	8986	107040	111303	103705	7598	
$	11641	2839	0	(8802)	2839	1019335	1011038	1058764	(7300)	5104	1019411	1070165	1067443	2722	
OH $	4355	2996	0	(1359)	2996	813043	813043	726112	0	19731	813040	837953	829295	5758	
MLY HR	5424	3700	618	(1644)	3162	87961	82697	102641	(4944)	(20004)	111220	115578	127648	(11570)	
$	23529	19853	3719	(9675)	16134	455256	429279	683091	(25577)	(253772)	580317	605282	759408	(154206)	
OH $	64209	44613	7436	(19591)	37182	1019830	961972	1260000	(57858)	(298028)	1259363	1357299	1479208	(121909)	
MATL $	54502	12930	64	(41672)	12866	310357	263662	484935	(46695)	(201273)	369492	345130	474898	(129768)	
OOC $	0	0	0	0	0	45658	45658	55541	0	(9883)	45658	45658	53542	(7884)	
TOT HR	6407	4103	618	(2304)	3485	194707	189246	200464	(5461)	(11219)	218260	226881	231153	(4272)	
TOT $	163335	83236	11219	(80099)	72017	3665640	3528302	4245423	(137338)	(717121)	4128281	4257597	4667874	(410277)	*
% VAR				49.0%	86.0%				3.0%	20.0%				9.6%	

LOWER WBS ELEMENTS
OR COST ACCOUNTS

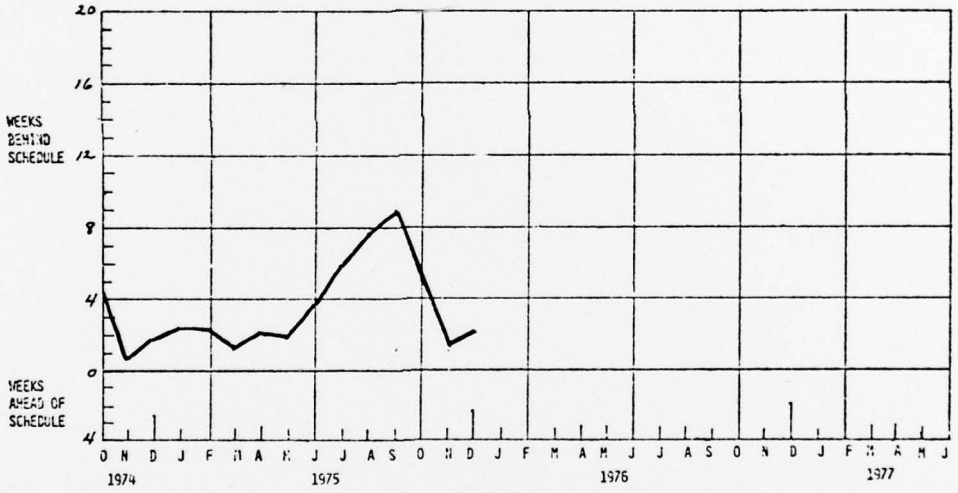
11A16			INTEGRATION		DIPIRO, J		OPEN		OPEN DATE 10 JAN 74 (A)		CLOSE DATE 31 JUL 76 (S)				
TOT $	36027	17477	14	(18550)	17463	496733	471918	615968	(24815)	(144050)	549187	695095	770584	(74659)	*
11A15			WING		DIPIRO, J		OPEN		OPEN DATE 10 JAN 74 (A)		CLOSE DATE 31 JAN 76 (S)				
TOT $	13322	16054	120	2732	15934	647029	630353	791154	(16676)	(160801)	674900	675107	717237	(42130)	*
11A14			EMPENNAGE		DIPIRO, J		OPEN		OPEN DATE 10 JAN 74 (A)		CLOSE DATE 31 MAR 76 (S)				
TOT $	44117	16938	925	(27179)	16013	555050	537447	635196	(17603)	(97749)	685078	697196	689115	8081	*
11A13			TAILCONE		DIPIRO, J		OPEN		OPEN DATE 10 JAN 74 (A)		CLOSE DATE 31 MAR 76 (S)				
TOT $	1495	760	2153	(735)	(1393)	194322	188355	249892	(5967)	(61537)	217723	216033	222386	(6353)	*
11A12			CENTER FUSE-RTR PYL		DIPIRO, J		OPEN		OPEN DATE 01 JAN 74 (A)		CLOSE DATE 30 JUN 76 (S)				
TOT $	50964	29040	931	(21924)	28109	1091900	1064751	1155213	(27149)	(90462)	1350737	1306576	1471563	(164987)	*
11A11			FORWARD FUSELAGE		DIPIRO, J		OPEN		OPEN DATE 10 JAN 74 (A)		CLOSE DATE 31 JAN 76 (S)				
TOT $	17410	2967	7076	(14443)	(4109)	650606	635478	798000	(15128)	(162522)	650606	666100	796939	(130799)	*

1.1.A.1 - BASIC STRUCTURE

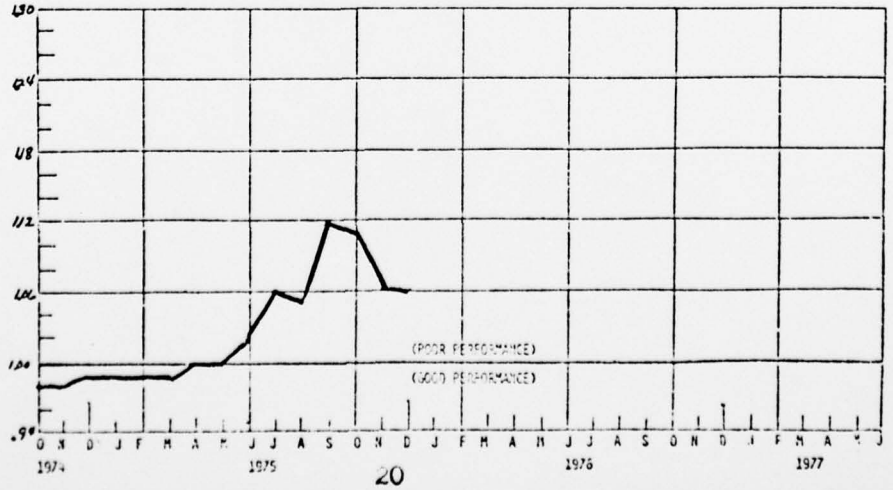
COST/SCHEDULE PERFORMANCE
VERSUS CAP PLAN



SCHEDULE STATUS



PERFORMANCE INDEX HISTORY
(TOTAL HOURS)

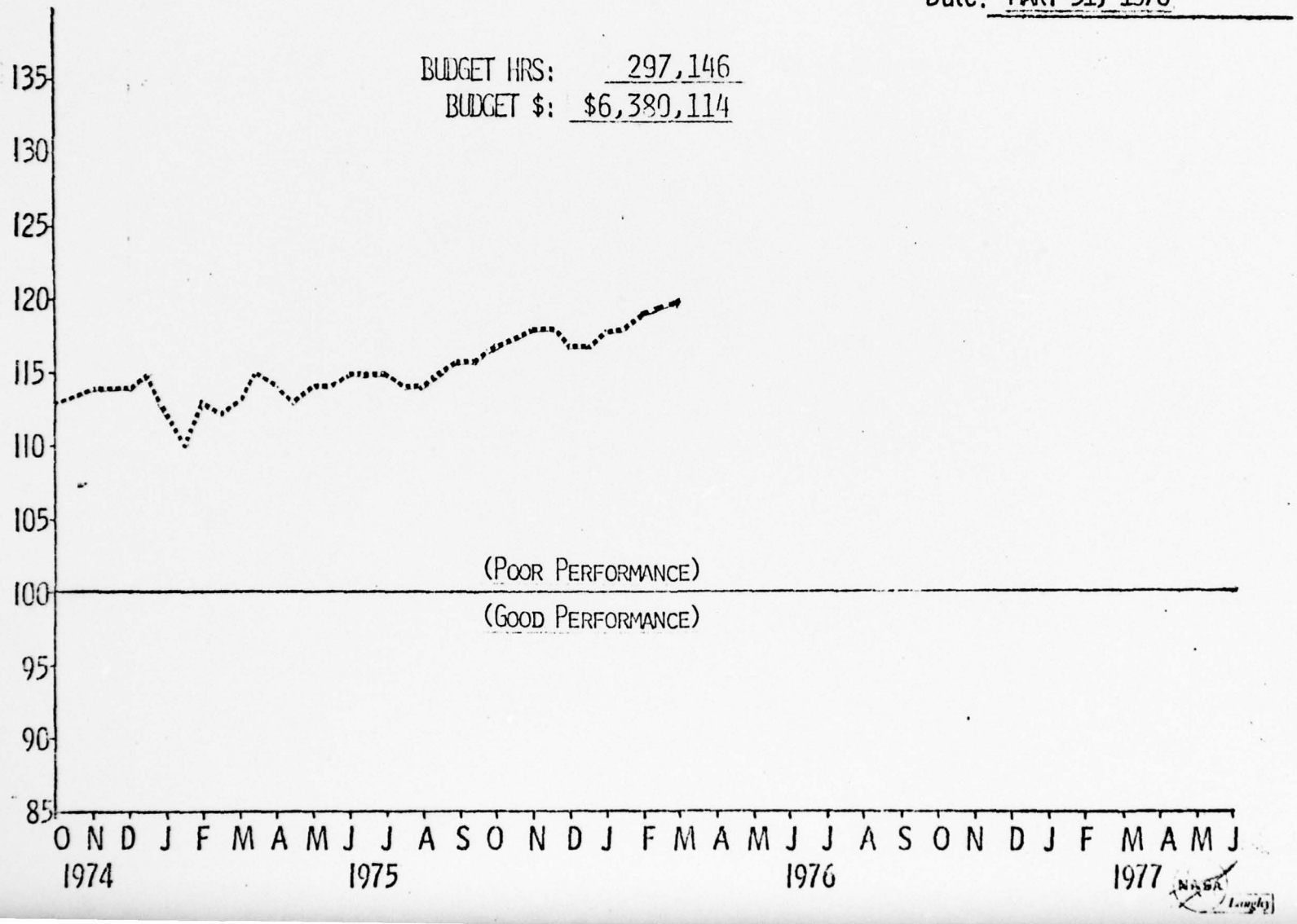


RSRA DESIGN PERFORMANCE

Hrs. 92 % Complete; 109 % Spent

Date: MAR. 31, 1976

BUDGET HRS: 297,146
BUDGET $: $6,380,114



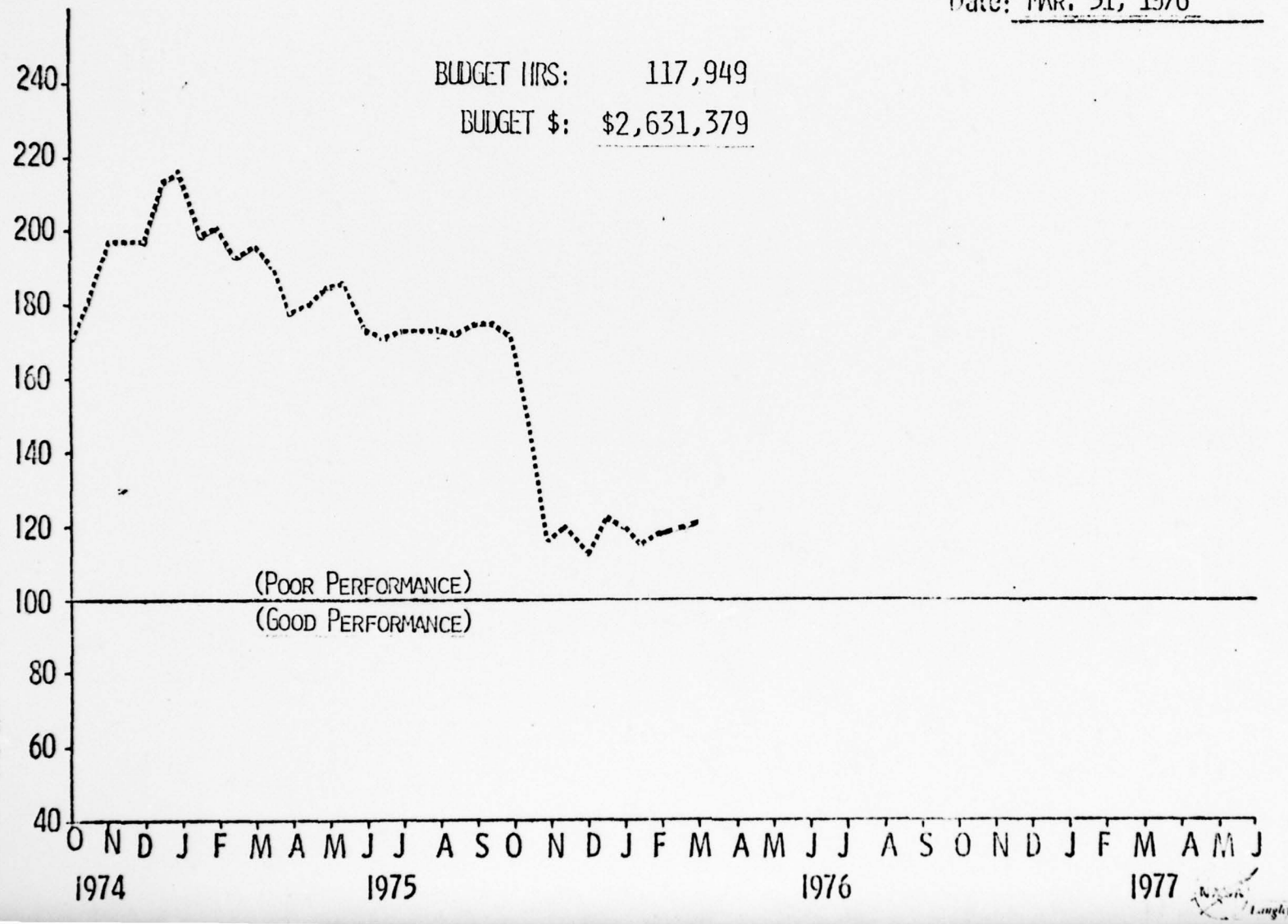
RSRA TEST PERFORMANCE

Hrs. 24% COMPLETE: 30 % SPENT

Date: MAR. 31, 1976

BUDGET HRS: 117,949

BUDGET $: $2,631,379

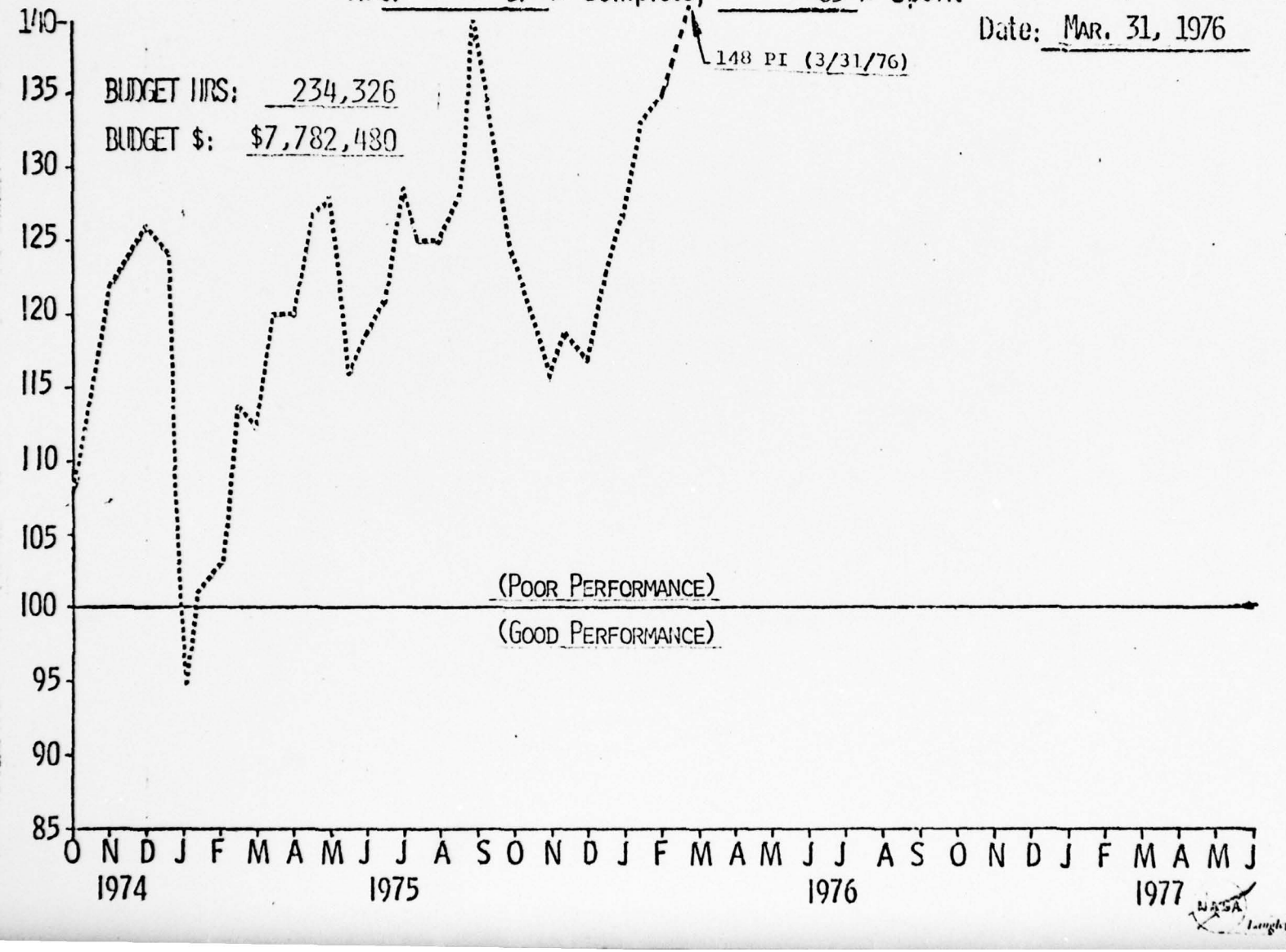


RSRA

MANUFACTURING PERFORMANCE

Hrs. 57 % Complete; 85 % Spent

Date: MAR. 31, 1976



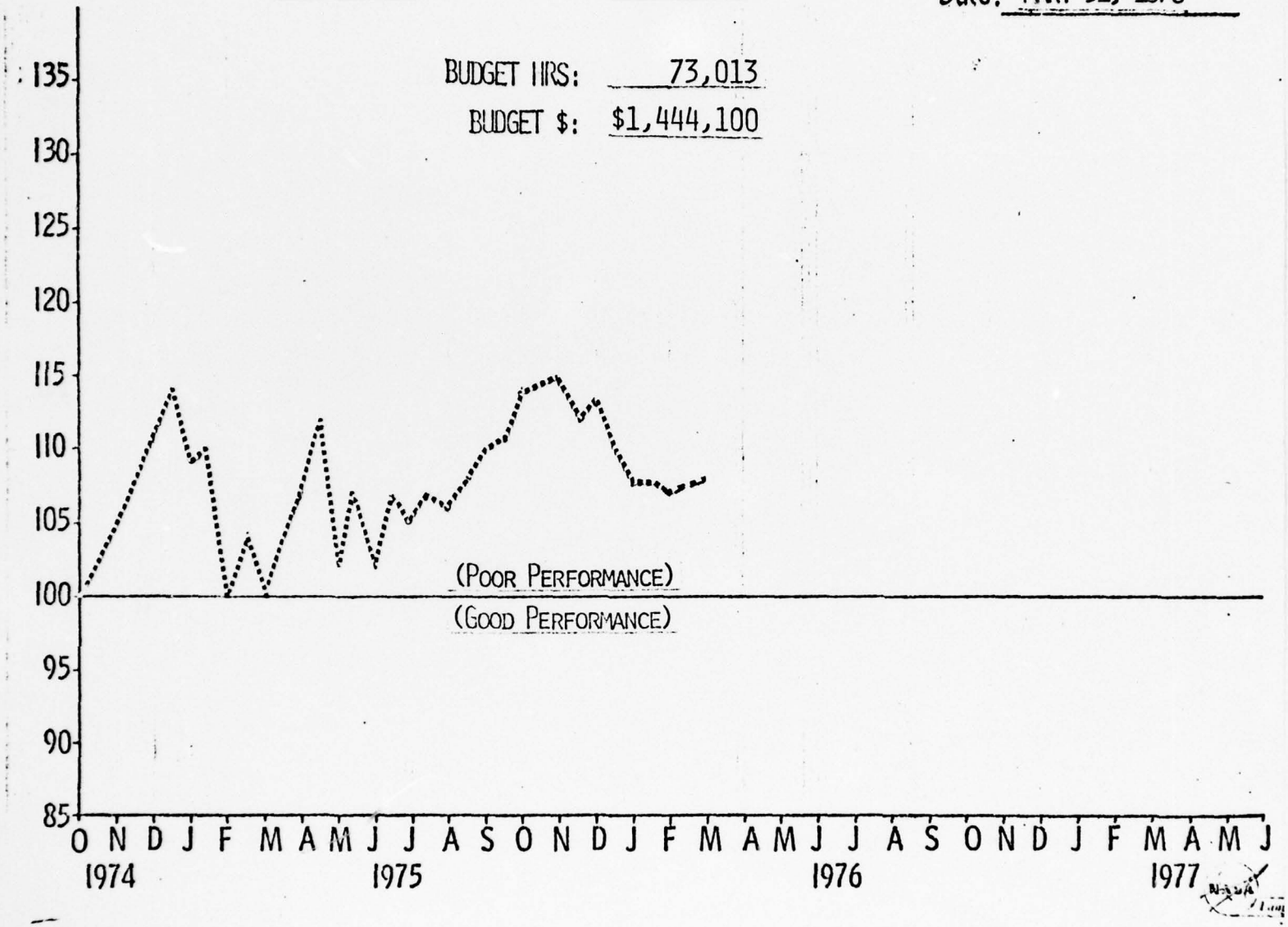
RSRA
MANUFACTURING ENGINEERING PERFORMANCE

Hrs. 89 % Complete; 96 % Spent

Date: MAR. 31, 1976

BUDGET HRS: 73,013

BUDGET $: $1,444,100



SUMMARY OF AIRFRAME MANUFACTURING STATUS

	% COMPLETE (HR)	P.I. (HR)
11 A 1 BASIC STRUCTURE	34	1.30
11 A 11 FORWARD FUSELAGE	69	1.46
11 A 12 CENTER FUSELAGE	22	1.18
11 A 13 TAIL CONE	23	1.32
11 A 14 EMPENNAGE	23	1.10
11 A 15 WING	42	1.29