AN INVESTIGATION OF THE MANAGEMENT CONTROL SYSTEM OF THE STRATEGIC AIR COMMAND

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All information contained in this thesis was obtained from unclassified sources and no material assigned a Department of Defense security classification or designation was reviewed in connection with the preparation of this analysis.

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CHAPTER I

THE NATURE AND ORGANIZATION OF THE STUDY

I. THE PROBLEM

The recent establishment in the United States of an operational missile force has focused attention on the gigantic task of managing simultaneously the many facets of missile development, test-site construction, construction and deployment of sites throughout the country, and activation of the completed hardware and facilities into operative weapon systems. The planning and controlling of this effort was based on the concept of concurrency, involving the compression of time-scheduling from the start of the development of the weapon system until it reached the inventory stage. The elaborate and complex techniques developed to control this program are but a small portion of those being studied and refined by the United States Air Force. Another control system currently in use was developed by the Strategic Air Command to aid in their managerial problems.

The Management Control System was instituted by the Strategic Air Command during the early Fifties in response to the need for absolute control of a strike-force dispersed world-wide, but capable of instant response to

control command. It still survives in much the same form as initially devised. The Strategic Air Command currently comprises $16.2 billion worth of resources, and a quarter million personnel. It's operating budget exceeds $1.8 billion. A flexible, sophisticated control system is mandatory if these resources are to be maintained in the responsive posture demanded of them.

It was the purpose of this investigation and analysis (1) to describe the scope and operation of the Management Control System as used by the Strategic Air Command and the Tactical Air Command; (2) to outline the requirements of each of these commands for an integrated control system; (3) to appraise the efficiency and effectiveness of the Management Control System; (4) to examine the applicability of the system to other organizations; and (5) to suggest possible refinements and corrections to the system.

II. IMPORTANCE AND SCOPE OF THE STUDY

The Air Force is faced with the problem of maintaining an aerospace force capable of instant retaliation with annihilative strength against any aggressor's warmaking capacity. With the emphasis on deterrence of aggression, it has been necessary to sustain this effort over a protracted period. The cost of this to the Nation has been

great, and the resources available are not unlimited. The annual cost of equipping, maintaining, and operating the Air Force, currently about $15.9 billion,[1] is 16 per cent of the Federal administrative budget and close to two and one-half per cent of the country's gross national product. Necessarily, then, the amount of money and resources expended by the military is limited by the strength of the economy. If these limitations are not recognized and heeded, the resultant force might provide a maximum of short-run security at the expense of future economic growth, and so, weaken the Nation's long-run ability to resist aggression. Cost, along with military aspects, must be considered in the planning and operation of the aerospace force.

Even so, the price for maintaining the peace is enormous. In part, this is caused by the necessity of defending against a potential force which can be delivered from almost any direction. The length of time from initial detection of the enemy attack to his time-over-target has shrunken to about twenty minutes. A defense against a threat such as this requires extremely complex, specialized equipment operated by highly skilled technicians. It must

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[1] United States Bureau of the Budget, The Budget of the United States Government-1965 (Washington: Government Printing Office, 1964), p. 212.

be flexible to counter various tactics, and incorporate the latest advances of our rapidly changing technologies. Each of these requisites is expensive, and without proper control, prohibitively so.

Therefore, one of the problems of the commander of a combat organization is to maintain a constant and adequate state of readiness with limited resources of men and materiel. The only way this is possible is by establishing proper objectives and directing the entire organization toward them. A necessary correlate is a responsive, informative control system.

A second, compelling reason for an organization such as the Strategic Air Command to have elaborate controls over its subordinate units is the totality of the type warfare for which it prepares. For them, there is no opportunity to test their capabilities under actual conditions and then make adjustments for deficiencies. So, the control system must provide the commander with information which is a realistic simulation of combat potential. This information must be both timely and complete.

While much has been done to perfect the Management Control System, a constant review is necessary to further adapt the system to the changing needs of the using agency.

Limitations to the study. The major focus of the

study is on evaluating the effectiveness and efficiency of the Management Control System. The investigation only incidentally concerns an assessment of the individual items covered by the system. This is due partly to the variance between the two major users, the Strategic Air Command and the Tactical Air Command, and partly to the classified nature of some of them--particularly those in the Operations area.

An examination of the objectives and organization of the using commands is included only to establish parameters for inquiry into the value of the control system.

III. PREVIOUS INVESTIGATIONS OF THE SUBJECT

The Management Control System is subject to constant review, and recommendations for its improvement are specifically encouraged by the implementing regulations. However, the main focus of these studies has been toward perfecting the standards, and adjusting the weights given items. More is written about this portion of the system in the next chapter. In addition, as a system embracing almost 350,000 persons, it is reasonable to expect that the Management Control System has been examined in staff studies and related studies by at least some of [illegible] men. Original essays are required by various Air Force schools for gradua-

tion, and the system almost certainly has been the subject of some of these.

However, most of these studies are concerned with either measuring standards involved or assessing the degree of equivalence of the reports with the actual performance. None of these have been received by the Management Analysis Division of the Strategic Air Command, the organization assigned the responsibility for system review. The chief of this division has encouraged this particular study.[2] Further, the Air University Library at Maxwell Air Force Base has no studies of the system on file.

IV. ORGANIZATION OF THE THESIS

The thesis is divided into five chapters. Chapter I is an introduction to the study. Definitions of terms as they are used in this thesis are contained in Appendix A. Chapter II contains a descriptive investigation of the Management Control System as used by both the Strategic Air Command and the Tactical Air Command. Comparisons are drawn between the two systems to reflect, in some cases, the differences between the two commands with their con-

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[2]Letter from Colonel D. W. Mulien to Captain Bennett Zinnecker, March 10, 1964.

trasting needs.

Chapter III is a historical investigation of fundamentals, elements, and requirements of various control systems. Individual factors of each are selected for their applicability to a military control system. Finally, the Management Control System is appraised according to these selected qualifications.

Chapter IV is a continuation of the qualitative study begun in the previous chapter. It contains a subjective evaluation of the Management Control System based on the opinions and experiences of individuals working within the system at the time of the study.

Chapter V is a summary of the major findings, and contains conclusions based on the findings of the various investigations. This latter section also includes suggestions for improvement of the Management Control System.

CHAPTER II

DESCRIPTION OF THE MANAGEMENT CONTROL SYSTEM, THE TACTICAL AIR COMMAND, AND THE STRATEGIC AIR COMMAND

This chapter is devoted to a description of the Management Control Systems used by the Tactical Air Command (TAC) and the Strategic Air Command (SAC). It details the objectives of the system, and the scoring procedures. Actual computations of several scored items are included as examples of the recording process; these results are also shown in their final-report format.

The second major part of this chapter is a brief record of the missions, operations, and needs of SAC and TAC. This will be used as the basis for subsequent inquiry into the effectiveness of the Management Control System.

I. THE MANAGEMENT CONTROL SYSTEM

The Management Control System, also referred to as MCS, is a detailed procedure for uniformly and precisely measuring mission capability and management of resources of two of the United States Air Force's combat commands--Strategic Air Command and Tactical Air Command. It provides a method for identifying problem areas and defining the action required at all levels to correct the problems. Beyond

being a pure control system, it is also partly an information system and partly a rating system.[1] The profit and loss statement of business organizations is similar in principle to the Management Control Statement, the major system report. Unlike the major accounting and control systems of business, the MCS measures performance in terms of fixed numbers of points rather than dollars. The number of points alloted to each function vary according to the amount of command emphasis desired.

Installed in 1949 by the Strategic Air Command, the Management Control System was altered and adapted during the early Fifties to aid in the control of the Nation's growing strategic bomber force. Since that time the methods of reporting have been modified, the items being measured have changed, and the points of emphasis have been altered, but the main objectives of the system have remained constant throughout this evolution. It still exists as an integral part of the total management system to aid commanders at all levels in directing their organizations to the accomplishment of the mission.

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[1]Headquarters Tactical Air Command, TAC Manual Number 178-1 [TAC Management Control System] (Langley Air Force Base, Va., July 1963), p. i; Headquarters Strategic Air Command, SAC Manual Number 170-2, Vol. I [SAC Management Control System] (Offutt Air Force Base, Nebr., January 1964), p. i; and Albert L. Pearl, "The SAC Management Control System," Air University Quarterly Review, Vol. XIII, No. 4, Summer 1962, p. 15.

General Walter Sweeny, Jr. used the system successfully as commander of SAC's Eighth Air Force. Upon assignment as Commander, Tactical Air Command, he installed the system in that command. While there are minor differences between the systems used by SAC and TAC, they are identical in their major aspects. The differences are due to variances in the objectives and operations of the two commands which are treated later in this chapter.

The objectives of the system are to:

> a. Evaluate the effectiveness of a unit toward attaining and maintaining combat capability.
>
> b. Determine the status of important tactical management and base management functions in relation to command standards and goals.
>
> c. Relate availability and effective utilization of resources to the requirements of assigned tasks.
>
> d. Provide the indicators of problem areas which affect the command mission.
>
> e. Emphasize functions and programs vital to maintaining combat capability.[2]

If all of these objectives and the basic spirit of MCS were summed up in one sentence, it would be something close to the last objective listed: "Emphasize functions and programs vital to maintaining combat capability."[3] The

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[2]Headquarters Strategic Air Command, op. cit., p. 1-1.

[3]Ibid.

wide range of coverage of MCS is suggested by the word "maintaining". This requires a flexible, responsive tool which is capable of reacting positively to changes in command objectives. The system is designed to implement the new requirement as well as sustain the established operation as long as it is needed. It does this, primarily, through its capability for altering the focus of command emphasis. This is accomplished by varying the relative weight of the scored items.

The Scoring Procedure

Approximately forty items are scored under MCS. The scoring is done monthly with major summaries each three months. The number of items scored is not important as it can change in response either to a new requirement or to the decline or de-emphasis of one in being. However, the distribution of points to the various areas is important. The Operations area receives about 45 per cent of the total possible points; Materiel receives about 35 per cent; Personnel receives 10 per cent; and the remaining 10 per cent is alloted to items which, properly, would be classified under several still different categories. While the distribution may change among these areas, over a period of time they have remained relatively constant, and their ranking has remained the same. Table I shows the breakdown

TABLE I

ELEMENTS AND ALLOCATED POINTS, BY AREAS, OF THE TAC MANAGEMENT CONTROL SYSTEM (TACTICAL FIGHTER WING)

ELEMENT	ALLOCATED POINTS
OPERATIONS	
Aircrew Training Minimums	700
Unit Training Accomplishments	500
Aircrew Combat Readiness	500
Aircrew Upgrading	400
Unit Reliability	400
Aircrew Reliability	600
Crew Proficiency	400
Receiver Refueling Efficiency	300
Forward Air Controllers	200
Jump Ready Forward Air Controllers	200
Flying Safety	300
Gun Camera Strafe	100
TOTAL	4600
MAINTENANCE	
Sortie Management	300
Sortie Cancellations	300
Sortie Additions	200
Early/Late Takeoffs	100
Shop Repair Capability	75
Engine Repair Capability	50
Periodic Inspection Turnaround	100
Cannibalization	200
Direct Productive Labor Utilization	100
Direct Productive Labor Documentation	100
Maintenance Overtime	100
Weapons Loading Capability	250
Training Events Lost	300
TOTAL	2175
SUPPORT	
Aircraft Not Operationally Ready-Supply	350
Demand Response	175
Delivery Priority Time	100
Flyaway Kits	75
Motor Vehicle Management	150

TABLE I (CONTINUED)

SUPPORT (CONTINUED)	
Commissary Operation	100
Base Exchange Operation	150
Fire Incidents	100
Utilization Civil Engineer Personnel	100
Civil Engineer Control Center Operation	150
Civil Engineer Obligation Rate	100
TOTAL	1550
PERSONNEL	
Officer Manning In Required Specialties	100
Airman Manning In Required Specialties	100
On-The-Job Training	200
Airman Retention	150
Officer Effectiveness Report Discrepancies	50
Officer Open Mess Management	150
Non-commissioned Officer Open Mess Management	150
TOTAL	900
GENERAL	
Information Activities	100
Security	200
Flying Safety	100
Ground Safety	200
Physical Fitness	100
Weight Control	100
Exercise "Run Fast"	200
Management of Training Devices	200
TOTAL	1200
GRAND TOTAL POINTS	10,425

of items by area and point value for the TAC system. Point allocation is basically the same for the SAC system.

The significance of the point distribution is the large amount of attention centered on the two areas which have the immediate responsibility for maintaining the aerospace vehicles (both planes and missiles) in a strike condition, for launching the force, and for completing the mission as planned. The other base functions are certainly necessary for the continuing performance of the unit. Even so, the major burden for planning and pursuing aerospace combat rests with Operations, and in a combat command, this must, necessarily, receive top priority. The manner in which both SAC and TAC have imposed the weight of their control systems reflects a clear recognition of this principle.

Operations area. The items evaluated in the Operations area are primarily concerned either with combat training completed during the quarter or with proficiency in maneuvers common to a strike mission. The Management Control System measures not only the quantity and quality of crew training, but also the efficiency with which the flying hour is used.[4] For instance, the TAC system awards

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[4]Pearl, op. cit., p. 19.

its largest number of points to the item Aircrew Training Minimums. Various training manuals specify in detail the minimum quantity of training for each crew each training period. This is to assure that a certain balance in training activity is achieved and that wide variations in activity are eliminated during the training cycle. The Management Control System reports the percentage of all combat-ready aircrews assigned which have performed these minimum requirements. Another item measures the unit reliability in the delivery of nuclear and non-nuclear ordnance. This element will be examined in detail later in the chapter, but basically, it facilitates an estimate of the probability for success in one aspect of weapon delivery.

The SAC system allocates its largest number of points for bomber units to Bombing Reliability. The item measures the skill of radar bombing against industrial targets. The navigator-bombardiers receive practice in target identification as they appear on their radarscopes. Radar Bomb Scoring (RBS) sites are situated near cities all across the Nation, and the bombers make their practice runs against these target complexes. Using a combination of radio and radar contact between aircraft and RBS site, the command can actually score the effectiveness of each of its combat crews without a single bomb being dropped. The course of

the bomber is automatically tracked on a plotting board. At the moment it would release its weapon, the bomber signals the scoring site by radio.[5] The scoring site then computes the probable point of impact and measures the distance from impact to the intended target. Whether the distance off-target is within the criteria established as satisfactory will determine its reliability.

Minimum Proficiency Training is SAC's title for an item very similar to TAC's Aircrew Training Minimums. The individual requirements are itemized and explained in SAC Manual 50-8. Also included are reliability standards when they pertain. While these are only several of the items included in Operations, they give some idea of the type elements measured by MCS.

Maintenance area. This concerns only maintenance which is performed on the aircraft or missiles. Highest priority in both the SAC and the TAC systems is given the generation of sorties according to schedule. Fairly strict adherence to a pre-planned schedule has been proven essential to successful management of a flying program. This schedule is prepared one week ahead, and specifies when each

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[5]United States Air Force, Reserve Officer Training Corp., Fundamentals of Aerospace Weapon Systems (Washington: Government Printing Office, 1961), p. 299.

airplane in the unit will fly. The schedule is developed by representatives from Operations and Maintenance, and is usually the result of some negotiation between the two groups. Operations determines how many sorties they will need to accomplish their training requirements, and Maintenance estimates how many planes they can have available based on past performance. When the predicted need exceeds the planned availability, compromise is necessary. However, once the schedule is agreed on and printed, any deviation, other than one allowed by the applicable regulations, will reduce the number of points awarded this item. An example of an allowable deviation would be the failure of a sortie to launch as scheduled due to extremely poor local weather conditions.

The Maintenance area yields an example of an item which is included in the TAC system, and which was once included in the SAC system but dropped due to its great improvement and consequent reduced need for command attention. The item is Cannibalization, and it denotes the practice of stripping parts from one aircraft to repair another. The innate futility of such a practice is obvious, and the usual result is cumulative ineffectiveness. It is generally done as a result of either the needed part not being available in Supply, or there being insufficient time

to get the needed part through base supply channels and still make a scheduled takeoff. The TAC system effectively discourages the practice, at least for the latter reason, by penalizing the unit more for cannibalizing the part than can be gained by making an on-time takeoff.

Other areas. Besides the two major areas, Operations and Maintenance, the remaining two areas each receive about ten per cent of the total points. Each control system has a Support area which includes such things as supply response capability, and the effectiveness of motor vehicle management.

The final area is named Base Management by SAC while TAC has two sub-areas, Personnel and General. Each comprises many of the same elements such as Airman Retention which measures the percentage of airmen re-enlisted to those eligible. Weight Control and Physical Fitness Testing reflect the increased interest by Headquarters USAF that all personnel maintain at least a specified minimum level of physical fitness.

The versatility and pervasiveness of the Management Control System is readily apparent in this area. From retention, to weight control by personnel, to the degree of safe operation of all ground equipment, to the profitability of the Officers' Club bar, the local commander is constantly

reminded of the contributory effect which these items make to the mission.

This discussion of the allocation of points among the areas covered by MCS and the description of items typical to the areas is necessarily brief. Entire manuals are devoted to the precise delineation of items. This includes the exact scope of performance, the standards involved, and in some cases, even the procedures for accomplishing the items. While all of these factors are essential precedents to effective control, a close examination of them is beyond the scope of this paper.

As mentioned above, MCS serves the local commander as a constant reminder of the importance of integrating the various elements of his command. He is constantly apprised of the standing of his unit by a base-level Management Analysis Section. This section gathers the reports of other base agencies and tabulates the results as they become available. In addition to this interim score-keeping function, the Analysis Section also prepares and submits the required monthly and quarterly reports to higher headquarters. The computation at base level of the unit scores has been found to be a valuable means of instilling a sense of participation at the bottom levels of the organization.

The Review Procedure

Both SAC and TAC provide for mandatory review of their Management Control Systems. SAC requires a yearly major review which consists of:

> A complete review of every item in the SAC Management Control System including any proposed new items. A major review will include all details of the scoring procedures of each item and re-evaluation of coverage and point values of the entire system.[6]

Besides studying the functional aspects of the system, the Review Committee has authority for far more inclusive action. It must:

> At each major review, consider recommended changes, additions and/or deletions to MCS areas. These recommendations can be from any level, i.e., Headquarters SAC staff, numbered air forces or from committee members. In addition to considering changes to specific MCS items, the Committee has the authority to review the purpose of the MCS, the philosophy behind the system, the general areas included in the MCS and any other proposals pertaining to the MCS which the Committee may deem appropriate.[7]

The review is conducted by the Commanders' Review Committee which is composed of four field commanders. Each of the three numbered air forces within the continental United States is represented by at least one of the committee members. Additional members may be added as needed. Tenure is limited to no more than three major reviews, and since a

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[6]Headquarters Strategic Air Command, op. cit., p. 2-1.

[7]Ibid., p. 2-2.

major review may be convened whenever it is required, this could be less than three years. The replacement of committee members after a period of service affords a degree of continuity while assuring a constant supply of new ideas.

In addition to the major reviews, the Committee also initiates routine changes to the system. A Routine Change might be "Any revision to scoring procedures, addition or deletion of items which requires a change to . . . the scoring manual."[8] Approval of these changes by the Committee may be made by telephone, letter, or message, and so immediate action is possible when necessary.

Before any major changes are considered by the Committee, extensive staff work is required of the agency suggesting the change. The minimum information furnished the Review Committee must include the following:

1. Clear definition of the item. This includes the experience to be measured, the experience not to be measured and the proportion of all experience that is included. For example, for measuring aircraft schedule deviations, show a list of the categories of sorties and deviations to be included and another list showing the sorties and deviations not to be included. Also show the percentage of all sorties and the percentage of all deviations to be included.

2. Show an experience trend, SAC average for the item and each sub-item, if any, broken down as applicable by weapon system or any other logical basis for the past three or four months.

3. Show the scoring table to be used, if any.

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[8]Ibid., p. 2-1.

4. Show the scores that each unit would have received for the latest scoring period for which data is available.

5. List the source for the data . . . .

6. If the proposal is to change an item previously scored, show the old method and the proposed new method of scoring.[9]

If the Committee favors a change, their recommendation is submitted to the Commander in Chief, SAC, for his final approval. The approved change is then distributed to the field commands for implementation.

The Tactical Air Command has much the same procedure with their Review Panel. It meets quarterly and tenure of membership is normally three meetings or slightly less than one year.

Computations and Reports - Examples

The main substance of the Management Control System is its information-gathering feature. The data must be processed accurately and quickly if it is to be of any value to the commander in his control function, and the results must be presented clearly and concisely.

In order to show the methods used in gathering the data and presenting it in usable form, examples of actual computations are presented. The examples were drawn from three different areas and from each Control System. While

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[9]Ibid., p. 2-3.

all have high point values for their areas, they were selected mainly to illustrate every feature of the computation and presentation of MCS out-put.

The first example is Sorties Delivered from the SAC system. The computation is the simplest of the three. On-The-Job Training, also from the SAC system, is next. The final example is Unit Reliability from the TAC system. It uses a complicated formula, and although some of its elements are classified and so will not be discussed, the manner in which they are presented will be shown.

Sorties Delivered. "This item measures the ability of the maintenance organization to deliver aircraft on the date and time required by the weekly . . . [flying] schedule."[10] Its purpose is to reduce the number of last-minute and inefficient changes to plans. All sorties launched are not subject to this requirement. For instance, flights for the purpose of testing the plane are exempted. A careful definition is made of those sorties which are counted under this item. Normally, this includes all those scheduled for the purpose of combat crew training. The basic figures are extracted from the weekly flying schedules and totaled for the training period.

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[10] Ibid., p. 6-15.

The rating, then, is based on the total number of chargeable sorties scheduled as compared to those scheduled but cancelled for maintenance, supply, or materiel reasons. The score is computed by determining the percentage delivered to scheduled. This percentage is then applied to the total points alloted the item. This direct conversion is the simplest method used in the scoring process, and requires no scoring table as does the next case. The formula is as follows:

$$\frac{\text{Chargeable Sorties Minus Sorties Not Delivered as Scheduled}}{\text{Chargeable Sorties}} \times 100 = \text{Per cent Sorties Delivered as Scheduled}$$

Example:

Total chargeable sorties - 352
Chargeable cancellations - 6

$\frac{352 - 6}{352}$ = 98.29 Per Cent Sorties Delivered As Scheduled
Round to 98.3 Per Cent.

Item weight is 300 points for bomber units.

98.3% x 300 = 295.9 Points Earned.

Airman On-The-Job Training. "This item measures the extent to which a base participates in the Airman On-The-Job Training Program and the effectiveness of the program implemented."[11] Its purpose is to increase the technical

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[11] Ibid., p. 8-1.

abilities of the enlisted personnel.

The item is composed of three sub-items which are scored semi-annually. The sub-items are In-Training, Number Passing Tests Versus Number Tested, and Upgrading. The scoring of each requires a scoring table, but the tables vary considerably in detail as will be seen. The basic data for all three elements is extracted from the Airman-On-The Job Training (OJT) Report.

In-Training ". . . measures the extent to which eligible airmen are entered into training."[12] Only ten points are alloted this sub-item, but the necessity for a high degree of participation to earn these is apparent from the scoring criteria. Points are earned only if performance is in the top one per cent possible. Anything less than 99 per cent participation results in no points being earned. The formula is as follows:

$$\frac{\text{Total in Training}}{\text{Total Eligible for OJT}} \times 100 = \text{Per Cent in Training}$$

Example:

Total in Training - 1629
Total Eligible for OJT - 1629

$\frac{1629}{1629} \times 100 = 100.0$ Per cent in Training. Scoring criteria provide ten Points Earned.

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[12] Ibid., p. 8-2.

Number Passing Tests Versus Number Tested ". . . measures the effectiveness of training through the ability of trainees to qualify on upgrading tests."[13] The sub-item is alloted 150 points, and the scoring table is seen to provide considerably greater latitude for less-than-perfect performance than did the previous one. The formula is as follows:

$$\frac{\text{Total Number Passing Tests}}{\text{Total Number Tested}} \times 100 = \text{Per Cent Passing Tests}$$

Table II is used to determine Points Earned.

Example:

Total Number Passing Tests - 464
Total Number Tested - 529

$\frac{464}{529} \times 100 = 87.71$ Per cent Passing Tests. Round to 87.7 Per cent.

Enter 87.7 Per Cent Passing Tests into Table II to obtain 150 Points Earned.

Upgrading ". . . measures the ability of bases to upgrade the eligible airmen through quality training."[14] Ninety points are alloted the element, and the scoring table differs from either of the first two by having its big point-break at the top rather than the bottom of the table. The formula is as follows:

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[13] Ibid., p. 8-3.

[14] Ibid., p. 8-5.

TABLE II

SCORING TABLE FOR ITEM
"NUMBER PASSING TESTS VERSUS NUMBER TESTED"

Percent Passing Tests	Points Earned
86.0 - 100.0	150.0
85.0 - 85.9	145.0
84.0 - 84.9	140.0
83.0 - 83.9	135.0
82.0 - 82.9	130.0
81.0 - 81.9	125.0
80.0 - 80.9	120.0
79.0 - 79.9	115.0
78.0 - 78.9	110.0
77.0 - 77.9	105.0
76.0 - 76.9	100.0
75.0 - 75.9	95.0
74.0 - 74.9	90.0
73.0 - 73.9	85.0
72.0 - 72.9	80.0
71.0 - 71.9	75.0
70.0 - 70.9	70.0
69.0 - 69.9	65.0
68.0 - 68.9	60.0
67.0 - 67.9	55.0
66.0 - 66.9	50.0
65.0 - 65.9	45.0
64.0 - 64.9	40.0
63.0 - 63.9	35.0
62.0 - 62.9	30.0
61.0 - 61.9	25.0
60.0 - 60.9	20.0
59.0 - 59.9	15.0
58.0 - 58.9	10.0
57.0 - 57.9	5.0
00.0 - 56.9	0.0

$$\frac{\text{Average Number Upgraded minus Average in Training for Excessive Period}}{\text{Total Number in Training at the End of the Previous Scoring Period}} \times 100 = \text{Per Cent Upgraded}$$

The averages referred to are those of the two training periods within the reporting period due to the semi-annual nature of this item. Table III is used to determine Points Earned.

Example:

Average Number Upgraded - 282
Average in Training for Excessive Period - 34
Total in Training at the End of the Previous Scoring Period - 968

$\frac{282 - 34}{968} \times 100 = 25.61$ Per Cent Upgraded. Round to 25.6 Per Cent.

Enter 25.6 Per Cent Upgraded into Table III to obtain 80.0 Points Earned.

The Points Earned for the sub-items are added together to determine the score for Airman On-The-Job Training.

Sub-Items	Points Earned
In Training	10.0
Number Passing Tests	150.0
Upgrading	80.0
	240.0

Unit Reliability. This item, a portion of the TAC system, measures the combat wing's operational proficiency in various types of ordnance delivery. The purpose is to determine the per cent of such training which meets the criteria established as satisfactory. It applies information extracted from the Aircrew Status and Training Report.

TABLE III

SCORING TABLE FOR ITEM "UPGRADING"

Percent Upgraded	Points Earned	
	CI	O/S
27.0 - 100.0	90.0	90.0
26.0 - 26.9	85.0	90.0
25.0 - 25.9	80.0	85.0
24.0 - 24.9	75.0	80.0
23.0 - 23.9	70.0	75.0
22.0 - 22.9	65.0	70.0
21.0 - 21.9	60.0	65.0
20.0 - 20.9	55.0	60.0
19.0 - 19.9	50.0	55.0
17.0 - 18.9	45.0	50.0
15.0 - 16.9	40.0	45.0
13.0 - 14.9	35.0	40.0
11.0 - 12.9	30.0	35.0
9.0 - 10.9	25.0	30.0
7.0 - 8.9	20.0	25.0
5.0 - 6.9	15.0	20.0
3.0 - 4.9	10.0	15.0
1.0 - 2.9	5.0	10.0
0	0.0	0.0

Unreliable activity attributed to improper maintenance or material malfunctions is not counted as an attempt. The item seeks to measure unit effectiveness solely as a function of pilot performance.

The item is scored quarterly, and the scoring is done by direct conversion of per cent reliable to total points alloted. For example, 355 points are the total possible. Four formulas are used in the computation of the item. They are as follows:

1. $\frac{\text{Successful Events}}{\text{Total Attempts Events}} \times 100 = \text{Per cent Successful}$

2. Per cent Successful x Reliability Factor = Adjusted Item Reliability

3. Adjusted Item Reliability x Allocated Points = Earned Points

4. $\frac{\text{Total Earned Points}}{\text{Total Allocated Points}} \times 100 = \text{Per cent Unit Reliability}$

Example:

The computations of the item are shown in Table IV. Average unit reliability can be found by dividing the earned points by the total allocated.

When the scoring process is completed, the reports are sent forward to comma.. :dquarters. The report on Unit Reliability is shown in Figure 1, page 32. At headquarters the reports are compiled into a single Management Control Statement which is then distributed to the subordinate

TABLE IV

COMPUTATIONS OF ITEM "UNIT RELIABILITY"

Scoring Table. Direct conversion: Percent Reliability = Percent Score.

Example. For an F-100 D/F Tactical Fight Unit:

(1) Item	(2) Number Attempts	(3) Number Successful	(4) % Successful (3) - (2)	(5) Factor	(6) % Reliable (4) x (5)	(7) Alloc. Points	(8) Earned Points (6) x (7)
Dive	115	75	65.2%	1.3	84.8%	70	59.4
LLB	120	120	100.0%	1.0	100.0%	20	20.0
Rockets	118	70	59.3%	1.4	83.0%	70	58.1
Dart	122	73	59.8%	1.6	95.7%	40	38.3
Strafe	117	94	80.3%	1.1	88.3%	55	48.6
TOTAL						255	224.4

Percent Unit Reliability = $\frac{224.4}{255} \times 100 = 88.0 = 88\%$ Unit Reliability.

MANAGEMENT CONTROL DATA	ORGANIZATION: XXX TAC FTR WG, XXXXX AFB, XXX.	REPORTS CONTROL SYMBOL: 1-TAC-T28; PERIOD COVERED: 1 Oct - 31 Dec 99

ITEM	MONTH			TOTAL FOR QUARTER[1]	PERCENT SCORE
2105. Unit Reliability (% Score)					86
a. Total Earned Points				306.1	
b. Total Allocated Points				335.0	
c. Percent Unit Reliability				86	
d. Nuclear Events	VTIP	VLD	VLADD -VTPU		
(1) Nr Successful	160	180	172		
(2) Nr Attempted	205	210	202		
(3) Percent Successful	78.0	85.7	85.1		
(4) Adjusted Item Reliability	78.0	85.7	85.1		
(5) Earned Points	39.0	25.7	17.0	81.7	
(6) Allocated Points	50.0	30.0	20.0	100.0	
e. Non-Nuclear Events	DIVE BOMB	LO LEV BOMB	RX		
(1) Nr Successful	75	120	70		
(2) Nr Attempted	115	120	118		
(3) Percent Successful	65.2	100.0	59.3		
(4) Adjusted Item Reliability	84.8	100.0	83.0		
(5) Earned Points	59.4	20.0	58.1	137.5	
(6) Allocated Points	70.0	20.0	70.0	160.0	
f. Non-Nuclear Events (Continued)	DART	STRAFE			
(1) Nr Successful	73	94			
(2) Nr Attempted	122	117			
(3) Percent Successful	59.8	80.3			
(4) Adjusted Item Reliability	95.7	88.3			
(5) Earned Points	38.3	48.6		86.9	
(6) Allocated Points	40.0	55.0		95.0	

1. Or 6 month period for those elements rated semiannually.

TAC FORM DEC 82 149 (PREVIOUS EDITION MAY BE USED)

FIGURE 1

SAMPLE REPORT ON UNIT RELIABILITY

units. It is in this final report that the entire operation of each of the two sprawling, complex organizations is summarized. From this highly distilled information, commanders at all levels are afforded an over-view of the total organization and the relationship of their unit to the whole and to the parts which, currently, is simply not available by any other means. As a primary source of information to aid in decision making, the Management Control Statement is of inestimable value.

By isolating problem areas, the Management Control System performs one of its major functions. Having detected a problem area, both SAC and TAC require analysis of the problem with the initial report. The SAC instructions stipulate:

> An analysis will be submitted for each item in the Tactical Management and Base Management areas which reflects a score for the reported scoring period below the applicable SAC standard for the reported scoring period . . . . The analysis will include reasons for the score below the SAC standard and a statement of corrective action taken or planned. Emphasis should be placed on cause, effect and corrective action taken, or possible, at base level. If action above base level is required, a statement of that requirement should be made.
>
> . . . . . .
>
> Information contained in the analyses will be used in briefing the Commander in Chief, SAC, his staff and commanders and staff at all levels.[15]

[15] Ibid., p. 3-8.

For purposes of illustration, two reports of unsatisfactory performance are shown. The first is a sample report concerning the item On Time Takeoffs. This item is very similar to Sorties Delivered, the computations for which were explained earlier in this chapter. The sortie considered non-effective in Sorties Delivered would be cancelled. The sortie under this item would be launched, but not in the time-block judged satisfactory. An excessive number of late takeoffs might be explained in this manner:

ITEM - On Time Takeoffs - 96.8%

a. Problem Area: Excessive number of late takeoffs.

b. Cause: Primarily due to material failures. A breakdown is as follows:

System	Material	Maintenance	Total
Power Plant	3	0	3
Electrical	3	1	4
Radar/Nav	1	0	1
Total	7	1	8

c. Corrective Action:

(1) Late takeoffs resulted primarily from material failure. However, there was no trend indicated by item failing. None were time change items and frequency of failure does not indicate a design problem.

(2) These deficiencies were discovered after delivery of aircraft to crew. The time element of obtaining and replacing parts prevented on time takeoff. Supply shortages did not contribute to any of these late takeoffs; however, the increase in manhours required, for stock chasing and in removing and replacing cannibalized parts, indicates possible trouble in the near future in this area.

(3) The corrective action indicated is to use more care in documenting aircraft deficiencies during debriefing. Deficiencies which were documented have been removed by proper maintenance action.[16]

The careful documentation of the problem should be noted. The corrective action is directed at the apparent cause, and from such a report, higher commands would be alerted to possible causal trends.

The second report is for the item Cannibalization. The format is slightly different from the preceeding one as this one is drawn from the TAC system while the other was a SAC report. Still, most of the elements are the same, and the purposes of the reports are identical. The report is shown in Figure 2, page 36.

Summation

This description of the Management Control System is meant to detail the service the system performs for the Strategic Air Command and the Tactical Air Command, and to relate its basic philosophy and overall operation. The system is unavoidably complex, and exacts the energies of many people in order to function. However, unless it actually renders the service for which it was created and does this efficiently, the whole structure must necessarily

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[16] Ibid., p. 3-10.

ANALYSIS OF MANAGEMENT CONTROL DATA	ORGANIZATION: XYZ TFW, Blank AF Base	PERIOD COVERED: Apr - Jun 62	REPORTS CONTROL SYMBOL: 3-TAC-T28
AREA: Maintenance	ELEMENT AND PERCENT SCORE: Cannibalization 0	SUB-ELEMENT AND PERCENT SCORE:	

PROBLEM

DEFINE SPECIFICALLY:
An excessive number of cannibalization actions were necessary in order to meet mission commitments.

CAUSE(S):
(1) Low depot fill rate.
(2) Tardiness in submission of supply requisitions.
(3) Excess backlog of work in the hydraulic and electric shops.

SAMPLE

EFFECT ON THE MISSION:
If the high rate of cannibalization continues, it will render this unit incapable of carrying out its mission on a sustained basis.

CORRECTIVE ACTION

TAKEN:
(1) Strong emphasis has been placed on accurate inputs to the Maintenance Data Collection system so that AFLC will receive sound data on which to base stock levels.
(2) The low depot fill rate has been brought to the attention of the Area Assistance Team.
(3) New requisitioning policies have been adopted which will provide base supply with more realistic lead time.

PLANNED:
A realignment of manpower resources coupled with an aggressive training program will take place during the next month. This action is designed to alleviate the work backlog in the hydraulic and electric shops.

NECESSARY BY HIGHER HEADQUARTERS:
A letter has been forwarded to Hq TAC requesting assistance in the solution of our supply problems. Attached to the letter is a tabulation (by S/N, item description and frequency) of items cannibalized during the last quarter.
Get Well Date: 31 August 1962.

FIGURE 2

be judged a waste and a failure. Toward the end of answering this question, the objectives and needs of both SAC and TAC are reviewed.

III. THE STRATEGIC AIR COMMAND AND THE TACTICAL AIR COMMAND

Before it is possible to evaluate the effectiveness of any control system, it is necessary to establish certain basic facts about the environment in which the system functions. This should include, as a minimum, the objectives of the organization, and something of its methods of operation. Once these are established, the needs of the organization can be identified, and the control system can be tested against the need. How well it responds to the need will be its effectiveness. Therefore, these brief outlines of SAC and TAC are preparatory to later evaluation of the Management Control System.

The two commands are alike in several ways. Both were established shortly after World War II, and have grown from forces of very limited capabilities to global, nuclear strike forces. Both support the national military objective of deterring any foreign aggressor from war. However, the methods by which they contribute differ as do their operational needs. Each has, however, an imperative need for

control of its forces; to fail in this function is to fail the job of deterrence.

Strategic Air Command

The Strategic Air Command is assigned the mission of deterring war, or if deterrence fails, of destroying the military power of the aggressor. Deterrence, to be effective, must combine a credible warmaking capability as well as the will to employ the force should it be needed. That SAC has the first and the American people the second, was manifest during the 1962 Cuban missile crisis. Should deterrence fail, SAC must maintain the ability to sustain an initial attack and retaliate with such force and tactics that it can penetrate the enemy's defenses and destroy his ability or willingness to wage war.

The effectiveness of SAC's deterrent capacity is clearly related to its retaliatory power. Two occurrences during the past decade have enormously compounded the problem of retaliation. First is the dramatic advance in military technology, and second is the resultant compression of time. The advanced technology has been responsible for supersonic (and now space) flight which has reduced both warning time and reaction time. This is demonstrably clear when one considers the months of reaction time available during World War II. By the Korean War, the threat of

intercontinental warfare was a reality, but still, warning time was measured in hours. Today, since the advent of the ballistic missile, warning time has dwindled to twenty minutes.

The implications of these facts are clearly reflected in SAC's operation. Its forces must be held in a constant state of readiness. Its plans, procedures, and orders must weld all its units into an integrated command. Its forces must be able to survive a nuclear attack and counter with such strength that they overwhelm the enemy's defenses and totally destroy his warmaking capacity. Precise coordination and integration of all counterforces is a necessity if they are to penetrate the enemy defenses. Major General Hewitt Wheless has identified this need. He writes:

> Penetration tactics are developed after careful analysis of the enemy defensive environment to ensure minimum attrition of our forces and maximum bombs or warheads on target. . . .
>
> The specific penetration tactics employed at any point in time are designed to exploit weaknesses in the enemy defensive posture. Here application of the principle of mass is fundamental to saturate any defense that cannot otherwise be countered through deception and surprise.[17]

General Curtis LeMay, writing as Chief of Staff, United States Air Force, has described the Strategic Air

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[17] Hewitt T. Wheless, "The Deterrent Offensive Force," Air University Quarterly Review, 12:71, Winter and Spring, 1960-1961.

Command when stating the requirement for peace. "Peace," he writes, "will depend on our ability to maintain a poised and war-ready war-fighting and war-winning force--a credible counterforce."[18]

Tactical Air Command

The Tactical Air Command complements SAC's contribution to the Nation's arsenal. The stalemate of nuclear forces which has prevented global war has not done the same for limited war. The recent build-up of tactical forces is an attempt to fill the need for a more flexible posture. Defense Secretary McNamara emphasized this point by noting:

> [We must] . . . increase our capacity to tailor our responses to a particular military challenge to that level of force which is both appropriate to the issue involved and militarily favorable to our side.
>
> This is the central theme of the increased emphasis on non-nuclear, limited war forces. Tactical Air Command has an important stake in this build-up of flexible, fast-reacting and highly mobile forces necessary to cope with the broadening scale of potential conflict.[19]

The mission of TAC is to provide fast-reacting, combat-ready aerospace units for employment anywhere in the

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[18]Curtis E. LeMay, "The Present Pattern," Air University Quarterly Review, 12:27, Winter and Spring, 1960-1961.

[19]Walter C. Sweeny, Jr., "Tactical Air Command Today," Army, Navy, Air Force Journal and Register, June 9, 1962, p. 24.

world on short notice to operate unilaterally or in concert with other forces.[20] The obligation to successfully engage the enemy at any level of the broad spectrum of conflict places a premium on flexibility, and TAC has provided for it with a mixed force unlike that of any other command. The force consists of various types of fighter aircraft, specially adapted bombers, cargo and troop carrier aircraft, helicopters, and ballistic missiles. It is capable of action with either conventional or nuclear weapons.

Such mobility and flexibility is possible only through painstaking advanced planning, the pre-packaging of support resources, and continuous, comprehensive training. Thorough standardization and recurring evaluation provide the command control which must be responsive, reliable, and quick.

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[20]Department of the Air Force, Air Force Regulation Number 23-10 [Organization and Mission--Tactical Air Command] (Washington, 7 March 1963), p. 1-3.

CHAPTER III

FORMULATION OF A CONTROL SYSTEM

This chapter is composed of three sections: (1) basic concepts, elements, and requirements of a military control system; (2) a brief review of the needs of SAC and TAC; and (3) a comparative analysis of this theoretical system and the Management Control System.

I. THE NATURE OF CONTROL

The nature of control is such that the requirements which different organizations demand of it will vary. However, each control need benefits from the study and use of certain guiding principles. While these principles are generally too broad to apply directly to practice, still they indicate an approach to the problems of control which will aid those building the management structure by assuring proper consideration of techniques and points which have proven to be useful in the past.

Each type of organization is bound to require different solutions to its problems. As its objectives, structure, and needs differ from those of other organizations, so too will its methods of operation and systems of control. Thus, it is simply not feasible to extract a control system unchanged

from a business enterprise and expect it to be effective in a military unit. Neither will a control feature necessarily be applicable even between different levels of the same organization. Each system must be tailored to the specific needs of the management of the organization by using the guides provided by control principles.

Concept and Purpose of Control

The first task in a discussion of control is to assure a clear understanding of the word. The hazards of assuming a common concept are apparent when one considers some of its current usages. For example, most references to "quality control" usually end by describing a planning practice. Similarly, the common control device of "standards" is in fact a plan for the amount of time, effort, cost, or other component to be used in a process or product.[1] Author Peter Drucker in his management classic The Practice of Management evinces such dislike for the word that he refuses to use it even in context where it is commonly accepted. He writes:

> So far in this book I have not talked of "control" at all. . . .This was intentional. For "control" is an ambiguous word. It means the ability to direct

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[1]Alex W. Rathe, "Management Controls in Business," Management Control Systems (New York: John Wiley & Sons, Inc., 1960), p. 37.

oneself and one's work. It can also mean domination of one person by another.[2]

To define control by describing its uses can also lead to little enlightenment and much confusion. Controls are used in a number of ways: (1) to standardize performance; (2) to safe guard assets from waste, theft, or misuse; (3) to standardize quality; (4) to set limits, for action not requiring higher approval; (5) to measure on-the-job performance; (6) for planning and programing; (7) by top management to keep operations in balance; and (8) to motivate individuals.[3]

An appeal to authority produces a wide range of definitions of control. A simple, vague definition is "'control' means 'check'. . . . It is the manager to keep track of what happens in order to evaluate results and people."[4] A more specific one defines control as ". . . that function of the system which provides direction in conformance to the plan, or in other words, the maintenance

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[2]Peter F. Drucker, The Practice of Management (New York: Harper & Row, 1954), p. 124.

[3]W. Travers Jerome, III, Executive Control--The Catalyst (New York: John Wiley & Sons, Inc., 1961), pp. 32-33.

[4]George Albert Smith, Jr., Managing Geographically Decentralized Companies (Cambridge, Mass.: The Riverside Press, 1958), p. 53.

of variations from system objectives within allowable limits."[5]

A definition with a broader view differentiates between two types of control.

> Controls governing routine and repetitive operations stress compliance. . . . Their primary function, therefore, is to serve in the area of internal control.
>
> Management controls, on the other hand, serve both as a measure of performance and as conditioners of the firm's working environment. The attitudes of planning and of self-evaluation are particularly powerful influences in a firm, for they are among the key forces that contribute to decisive and continuous progress. This capability of any given executive control to motivate constructive action is by all odds its most important characteristic. This contrasts with the compliance or command feature of other types of control.[6]

A final view stresses the possible personal implications. "Control itself can be defined as the making of decision and taking of actions required by the responsibilities of each position."[7]

For the purposes of this study, control shall denote the process of setting standards; the recording and evalua-

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[5]Richard A. Johnson, Fremont E. Kast, and James E. Rosenzweig, The Theory and Management of Systems (New York: McGraw-Hill Book Company, Inc., 1963), p. 58.

[6]Jerome, op. cit., p. 34.

[7]Arnold F. Emch, "Control Means Action," Harvard Business Review, 32:95, July-August, 1954.

tion of performance; and the returning of performance to the plan should significant deviation occur. This definition is consistant with those found in a number of authoritative texts on the subject.[8,9]

Control as a Function of Management

Having settled on a definition of control, some explanation should be made of its relationship to the other functions and to management as a whole. As is true of the other functions of management, control cannot be effective if it is separated from the rest of the structure. Nowhere is this seen more clearly than with the interrelationship of control and planning.

Control depends on planning for its very beginning. It is planning which determines the allowable latitude of operations as the organization proceeds toward the planned goals. Yet without control, the movement could not be

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[8]See George R. Terry, Principles of Management (3rd Ed.) (Homewood, Ill.: Richard D. Irwin, Inc., 1960), p. 529; and Ralph Davis, Industrial Organization and Management (New York: Harper & Bros., 1940), p. 121.

[9]Henri Fayol has given the following definition. "Control consists in verifying whether everything occurs in conformity with the plan adopted, the instruction issued and principles established. It has for object to point out weaknesses and errors in order to rectify them and prevent recurrence. It operates on everything; things, people, actions. . . . For control to be effective it must be done within reasonable time and be followed up by sanctions." General and Industrial Management (London: Pitman Publishing Corp., 1949), pp. 107-108.

maintained within the limits to action as there would be no way of knowing just where a deviation had occurred, why it occurred, or how to return it to course. Control's feature of feed-back of information is mandatory for rational planning. For follow-on planning to be effective, the control system must provide accurate, timely information.

Just as planning and control support and complement each other, control both aids and uses direction and coordination. Control, when used to best advantage, will permeate the entire management process. It will provide the top manager an overview of the organization not available by any other means. The pervasiveness of control is aptly described by William Jerome, Dean of the College of Business at Syracuse University. He sees it as the catalyst of management which draws together the various other functions into a meaningful, workable whole.

During the past five years, a number of authors have stressed the divisibility of control into two distinct types. They show one type of control as most appropriate for internal or daily operations. The other type has been called "Higher Control",[10] "Over-all Control",[11] or "Top Manage-

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[10]Thomas G. Rose, Higher Management Control (New York: McGraw-Hill Book Company, Inc., 1957).

[11]Terry, op. cit., p. 547.

ment Control."[12] It is used for long-range planning and general direction of the organization. With each of the two types, the focus of control varies within the managerial structure, but still the factors which make the control necessary do remain constant. Both enable management to evaluate performance; to identify trends; and to locate areas of below-standard operation in order that they may receive further investigation and analysis.[13]

The major impetus for the development of both internal and higher controls has come from the increased interest and use of decentralization as a method of coping with organizational growth. The use of decentralization has changed the concept of control from what it was a decade ago, and has added to its importance.

Centralized Control

For a time during the mid-fifties decentralization became almost synonymous with progressive management. This was due in part to its success in such firms as Sears, Roebuck, and Company and General Motors, and partly to its effective exposition by such authors as Peter Drucker and Ralph Cordiner. In the unprecedented rush of companies all

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[12]Smith, op. cit., p. 9.

[13]Rose, op. cit., p. 97.

over the nation to decentralize, too little consideration was given the inevitable attendant problems.[14]

Instead of the expected increase of profits and decrease of central decisions and problems, many companies discovered their operations to be floundering disastrously. Top management found it no longer had control of operations and was unable to effectively plan for company-wide needs. Coordination of lower divisions' efforts became chaotic. The request for more information resulted in an avalanche of figures, data, and unrelated reports. Out of desperation, many of these companies returned to their former methods of operation with little idea of why decentralization had not worked for them.

The central problem in many cases was the failure of top management to specify the responsibilities of its lower echelons and to devise a method of assuring compliance of these assignments. Internal control systems were established in those companies which successfully decentralized, and they have provided a portion of the necessary continuity of performance. Even so, these systems are not without their drawbacks. Professor Willis Jerome explains the use of internal controls, and warns of their shortcomings.

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[14] See George A. Smith's book Managing Geographically Decentralized Companies for an excellent presentation of actual cases involving problems of decentralization.

He writes:

> The system of internal control . . . [is] an elaborate expression of top management's will. The entire purpose of the system is to make certain that lower management carries out its commission from top management. Compliance is necessarily the central feature of such a system.
>
> This sort of approach is both very useful and very necessary in most organizations. At the same time, two aspects of such an approach must be kept continually in mind. The first is this: given any set of plans or policies or procedures, as part of a system of internal control, how do we know that these are the best plans, policies, or procedures to follow? Compliance with these controls may be required of lower management, and the degree of success achieved by lower management judged in turn by the degree of compliance. Yet, this is no answer and provides no criteria to help top management decide on these particular controls in contrast to other possible alternative controls. In fact, our problem is one of identifying the criteria that will enable managers to answer the question, "Why this system of control instead of some other?"[15]

His solution, and that of other authors, is to devise a central control system which will furnish top management the needed overview of the enterprise. The Management Control System, while used for planning, is primarily an internal control system, and so this discussion will concentrate on that type of control system and only incidently discuss the broader, more inclusive system which embraces planning, forecasting, and other managerial functions.

The quotation by Professor Jerome mentions the

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[15]Jerome, op. cit., p. 74.

aspect of compliance inherent in the internal control system. Too great regulation of individuals has repeatedly been shown to stifle their initiative and creativity, both of which are necessary for most productive work. Thus, the dilemma of internal control is how to encourage greater initiative on the part of subordinates by affording a flexibility of operations, yet minimize the chances of error by keeping operations standardized.[16] Unfortunately, the dividing line which separates excessive, stifling regulation from a freeness of operation which might fail to detect mistakes or unfavorable situations early enough for top management to take appropriate action seems difficult to attain. While there is no single solution, indications are that the answer lies in the attitudes and actions of the people concerned rather than in tools or techniques.

To be successful, the control system must provide management with the information it needs when it is needed. This necessitates company-wide standardization of procedures for gathering and reporting data. As the information will be used at times to judge people, its validity should be accepted by everyone in the organization. Such an expectation, however, is utopian. In spite of the reasonable

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[16] Ibid., p. 75.

requirement that each person be judged, those who suffer in comparison are bound to reject and fault the entire control system. Also, where the subordinate is judged, promoted, or paid on the basis of this information which he supplies, top management must expect a degree of distortion and inflation in the reports.[17] This is not to suggest that deliberate falsification of records will occur, but rather that instructions and procedures for reporting will be interpreted by the individual to his advantage and not necessarily according to the intent of top management. Therefore, along with the standardization of reporting procedures, careful limits must be placed on the interpretations of the instructions and the resultant data.

An excellent summation of this aspect of the problem of decentralization is found in the book Dynamic Management in Industry. The author, Raymond Villars, writes:

> The main obstacles to the effective operation of the system of centralized planning and control associated with decentralization of authority and responsibility are, essentially, the risk of misunderstanding and the risk of abuse.
>
> It should be expected that, at fist, the system be interpreted as a sort of "police system" even though it is not at all the case. It should also be understood that this system is no substitute for good management. It is only a tool of management. Like any

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[17] William Dill, Thomas L. Hilton, and Walter R. Reitman, The New Managers (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962), p. 125.

> other tool, it may be misused; and precisely because it is effective, it may become dangerous. It may become an instrument of oppression if excessive emphasis is placed on "control"; or it may become the source of serious disruptions if, on the contrary, "decentralization" is overemphasized. At the same time, experience shows that this concept, if applied with skill and moderation, provides a solution to the strange dilemma in which industrial management finds itself today. . . . Management can use the concept to reconcile the technical necessity for individual freedom of action in industry. To avoid misunderstandings and abuses of the system, it is necessary to obtain the full cooperation of everyone involved and the full recognition that the planning and control function operates as a service department.[13]

The Procedure of Control

The control procedure is succinctly described as the means by which performance is measured against a standard to determine the feedback which is used to correct deviations by means of remedial action. Two clauses of this statement refer to acts which are particularly germane to the discussion, and so are considered at some length. First is the process of and considerations for setting the standards, and second is the act of correcting deviations.

Development of standards. The setting of standards was identified previously in this chapter as a planning function in that amounts of time, effort, cost, or other components are specified (or planned) for a process or

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[13] Raymond Villers, Dynamic Management in Industry (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960), p. 110.

product. Its importance arises from the total dependence of the other steps in the control process on it. The methods used for setting standards vary widely, but can be grouped under the heading of (1) past performance, (2) appraisal, or (3) scientific procedure.

The method of basing standards on past performance is self-explanatory. Appraisal could be nothing more than an estimate or it could be a projection of past performance in line with future changes of objectives. The scientific method could involve measurements of varying degrees of precision depending on the case. Also it might use relationships such as the rate of increase of labor hours for periodic aircraft maintenance in relation to the number of flying hours accomplished. Regardless of which method or combination of methods is used, the setting of standards depends for success on practical judgment. Since judgment is necessary, the adequacy of the standards will reflect the degree of experience and expertise of those setting the standards. It is important that the person affected by the standards have a voice in their development. Such action will contribute to the motivating influence of a fair, acceptable standard. If the person does not consider the standard to be valid, he is unlikely to willingly use it to adjust his performance. Should others use that standard to

rate his work, he will probably attempt to reject this also.

The Air Force lists criteria for usable standards which tell little of how to accomplish the job, but do give some idea of the scope of consideration. It suggests the following criteria: (1) identifiable, (2) objective, (3) applicable, (4) stable, (5) attainable, and (6) acceptable.[19]

Measuring performance. After agreeing on standards, the next step is measuring performance against them. More will be said about this later in the chapter, but the procedure is depicted clearly by the equation S - A = V. S is the standard; A is actual performance; and V is the variance or deviation.[20] Should the procedure detect significant variance, it is necessary to correct the movement back within acceptable limits.

Acting. The correcting of deviation is the point at which the entire managerial process can be tested. The test will reveal whether management is only responding to circumstances as they exist or whether it is taking steps to

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[19]Department of the Air Force, Air Force Manual Number 170-2 [Management Analysis] (Washington: Government Printing Office, 1957), p. 54.

[20]Villers, op. cit., p. 363.

actually shape future circumstances. If the reaction to deviation is remedial rather than only corrective, management is using internal control in its most useful function. Management is searching for the cause of the problem in order that it may eliminate its effect on future operations.

The emphasis toward remedial action points up the importance of the individual with his ability to choose from among alternatives. Fortunately, the information available to the individual has been increasingly accurate and timely due to the development of control systems which are more sensative and responsive. Still, at best, control reports only facilitate the use of human judgment; they can never serve as a substitute for it. The success of any system of controls will always depend on the men utilizing the information.

II. REQUIREMENTS OF AN AIR FORCE CONTROL SYSTEM

The Problem of Control

The problems of control in SAC and TAC are far different from those of any business enterprise. The management problem is caused mainly by the immense size and geographical dispersion of each organization; the complex interrelations between the many parts and layers of their

organizations; the dynamic nature of the threat-response dichotomy; and the need for precisely coordinated action of all components. Change is continual; each organization must respond to new tactics, techniques, strategies, weapon systems, and a host of para-military decisions affected by politics and economics. Few industries can match the complexity of equipment or scope of operation of either of the two commands. Yet, the command components must be able to act in concert totally unnecessary for any industry. As a result, each assumes the delicate task of maintaining flexibility with a high degree of conformity and standardization. It is partially through their control systems they hope to achieve this.

The fact that controls must vary according to the organizational structure was discussed earlier in this chapter. The final judgment has still to be made as to the degree of centralization or decentralization of either SAC or TAC. To argue the question here would serve little purpose and most probably end in a generalization with a number of qualifications. The fact is that local commanders do have significant freedom of action within constraints which are somewhat more confining than those common in industry. Much of the standardization typical of these two commands is due to a close identity of objectives among

their components, and a relatively narrow range of choice of appropriate techniques.[21] The local commanders, in order to fulfill their commissions, must depend on the Management Control System for consolidated operational data.

The Control System

When an organization becomes as large, diverse, and as rapidly changing as SAC or TAC, the task is to ensure a flow of information that provides enough material to support the right decisions at each level but pyramid only necessary and consolidated information to the higher level. Henry Gantt expressed the need for information in this manner: "If we allow ourselves to be governed by opinion where it is possible to obtain facts, we shall lose in our competition with those who base their actions on fact."[22] Thus, the control system provides management with the information it must have. It makes possible performance measurement of functional responsibilities while presenting an overview of the total operation.

The manner in which a control system does these things

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[21]Department of the Air Force, Air Force Manual Number 25-1 [The Management Process] (Washington: Government Printing Office, 1954), p. 57.

[22]Henry L. Gantt, Industrial Leadership (New Haven, Conn.: Yale University Press, 1916), p. 89.

may be studied by separating the system into its elements. These same elements, having been established essential to the system will be used later in an analysis of the Management Control System. The breakdown used in this analysis is basically that of Professor Harold Koontz.[23] However, the works of other authors were liberally used to modify and add to his list.

Reflect the nature and needs of the organization. A multitude of factors could be grouped under this item, but what is meant here is that the system must be tailored to the specific management needs of the organization. Further, it must be objective oriented, and subject to periodic review to determine its applicability to current needs. This is especially important in a bureaucratic structure where policies and procedures too often become customs with a certain weight of their own.

Timely. Information must be made available to those needing it while there is still opportunity to change the course of events or before events deviate still further from the desired norm. This necessitates a constant awareness of the tendency of control systems to develop to the

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[23]Harold Koontz, "Make Your Plans Succeed," Nation's Business, 46:102-108, October, 1958.

extent they become cumbersome and loose their ability for prompt transmission of data.

Flexible. The control system must be capable of adding or deleting functions without requiring a complete reorganization. It should respond to changing organization objectives.

Forward looking. The purpose of the system is to deliver information to be used for decision making. Therefore, the information should generally be in the form of trends or comparisons rather than data of a static nature. For this reason, accounting data alone is inadequate in almost all cases.

Limited to strategic points. This facilitates the overview so necessary to effective management by presenting reports which are comprehensive yet not burdened with detail. This element fits naturally in with the next.

Point up exceptions. Management by exception is possible only with the establishment of standards against which to measure performance. The system must assure management that nothing of operational importance can occur without attention being drawn to it.

Assure corrective action. The basis of decentralization is the delegation of responsibility and the assignment of authority, within limits, to the operational level. Therefore, top command must know the status of operations and be certain that when deviations occur, corrective actions will be taken.

In addition to these requirements, the output of the system must be accurate. As the comparison of performance with the standard and the discovery of difference, if any, is done as close to the point of performance as possible, occasional distortion or manipulation of data must be expected. Hence, management should retain a final check of the control system. This is most commonly done through audits and meetings or conferences between top management and the lower echelons. While not a part of the system, they must be considered correlates.

System Audits

> From time to time, the chief leader should dip into the operation of his organization for information purposes. This is neither to suggest a practice of going over the heads of his assistant leaders or even a habit of mistrusting them. It is rather to recommend the value of first hand knowledge of what is transpiring.[24]

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[24]Clyde T. Hardwick and Bernard F. Landuyt, Administrative Strategy (New York: Simmons-Boardman, Inc., 1961), p. 446.

In this manner Hardwick and Landuyt explain the need for check of the system. The audit or personal meeting should no more be considered an imposition or breach-of-trust by those using the control system than the system itself is. Each is one method by which top management meets its responsibility toward the organization and its objectives.

In addition to verifying the validity of control reports, the audit or meeting is a valuable opportunity for personal communication between the office of the chief executive and the operational levels. It is an opportunity for the top executives to know their men, to sample their feelings, or to supplement formal information channels.[25]

III. ANALYSIS OF THE MANAGEMENT CONTROL SYSTEM

The Management Control System has reached its present form in SAC through a process of evolution lasting almost fifteen years. Many of its changes have been caused by the need for increased responsiveness to field conditions. Reporting procedures have been altered to exploit the improvements in data processing equipment. Although TAC's system was essentially patterned after the SAC system, changes have occurred during its relatively brief existence. These

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[25]Smith, op. cit., pp. 103-104.

changes are indicative of the efforts of people at all managerial levels to assure that the first requirement of a control system is satisfied.

Reflect the nature and needs of the organization. It was established in Section II of this chapter that one of the major needs of the two commands is a means for positively assuring that a high state of combat readiness exists at all times. In order to achieve this, a standardized rating system has been devised. Standards are established to guide local commanders and aid them in their assignments.

The allocation of point values to the items included in the system has served to emphasize their relative importance, and has provided a method for assessing total performance of a unit. This is a prime need of commanders at all levels. As managers in the Air Force, they must keep continually in mind that they work with imprecise safeguards against inflexibility or carelessness. In contrast to private industry, they have not the finite measuring stick of profit nor the last resort of bankruptcy as a way out. In the face of the constant threat of annihilation, they literally have no alternative to success. Only by constructing specific short-range goals and measuring the degree of success of their attainment, can an estimate of effectiveness be achieved.

Another factor which weighs in favor of a positive judgment of this requirement is the long life of the system in SAC. The commanders' review panel must be credited with keeping the system applicable to current operational needs and mission-oriented. Through their efforts, the needs of line organizations for control are satisfied.

Timely. Timeliness is the very essence of the operations of a combat command. The Management Control System contributes to this need through its procedure of daily, cumulative recording of key items. These are the high point items and the local commanders are briefed daily on their status. In this way, the commander and his staff are often able to isolate potential problem areas, and can, in many cases, take corrective action before a serious problem develops.

Higher headquarters is informed of current operation in the monthly informational data reports which are sent from each local unit. Headquarters then compiles the data into a single report and distributes it back to the local units. Reports covering the entire scoring period are submitted by local units four times each year, and in SAC the headquarters Director of Comptroller prepares from this information the semi-annual "SAC Management Control State-

ment" which is a summary of performance of each reporting unit in the command.

Flexible. The unremitting change of items and procedures which has typified the course of MCS testifies to the flexibility of the system. In addition, it affords a potential for the shifting of emphasis among items through the point allocation.

Commanders at all levels have found the Management Control System to be highly adaptable to their particular needs. Brigadier General Albert Pearl as Comptroller of SAC, has stressed this feature. He writes:

> Top commanders have regarded the Management Control System as a valuable motivating device which they could "play like a piano" to keep it responsive to their changing requirements for managing the command. This they do by adding items, deleting items, changing point weights, and changing standards.
>
> Numbered air force commanders have pursued the Management Control System even more vigorously as a tool for motivation and control.
>
> . . . . . .
>
> Practically all wing commanders have squadron management control systems. These are not required by SAC Headquarters but are encouraged for the same reasons that we have a SAC Management Control System. These squadron management control systems score individual squadrons on many of the items that are scored on a wing basis in the SAC Management Control System.[26]

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[26]Albert L. Pearl, "The SAC Management Control System," Air University Quarterly Review, Vol. XIII, No. 4, Summer 1962, p. 21.

Forward looking. The methods of graphic data presentation used by both commands facilitates trend analysis. Basically, the control data is displayed on charts for the briefing of commanders at all echelons of command. Although no standard form of presentation is directed, still a fairly common pattern of briefing charts has developed in SAC.[27] The charts show current status as well as that of preceding periods. From this information, trends can be identified either for general status or for performance by areas and items.

In addition, the relative positions of collateral units is displayed. This comparison is based on total score for each unit which combines all items into a single percentage for the unit. This has been found to be an important motivating device, and is used widely at all levels of command.[28]

Limited to strategic points. The best assurance that the Management Control System does limit managerial attention to strategic points is related to the method by which items are selected for inclusion. The members of the commanders' review panel are concerned with training and

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[27] Ibid., p. 24.

[28] Ibid., p. 18.

maintaining a combat-ready unit, and toward this end have selected for review those elements of the total operation which tend to be most critical.

One might question the criticality of some of the sub-items--especially some in the base management area. There is no doubt that the profitability of the Officers' Club bar[29] is of less than paramount importance. Similarly, the amount of unit historical data submitted to air force archives[30] will have no bearing on the unit's potential for combat. Still, the relative weight given these sub-items to the weight given truly critical items clearly establishes the importance of each, and puts the procedure into a more rational perspective. The total points possible for the bar profits are five per cent of those for air-refueling efficiency[31] while historical contributions yield one per cent of the points possible for bombing reliability.[32]

Thus, the point allocation effectively focuses attention on strategic points even though the system is not limited to them.

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[29]Headquarters Tactical Air Command, TAC Manual Number 178-1 [TAC Management Control System] (Langley Air Force Base, Virginia, July, 1965), p. 18.

[30]Headquarters Strategic Air Command, SAC Manual Number 170-2, Vol. I [SAC Management Control System] (Offutt Air Force Base, Nebraska, January 1964), p. 8-43.

[31]Headquarters Tactical Air Command, op. cit., p. xiii.

[32]Headquarters Strategic Air Command, op. cit., p. ii.

Point up exceptions, and assure corrective action.

Each of these requirements is met through the analysis procedures specified by both SAC and TAC. The SAC instructions require:

> An analysis will be submitted for each item in the Tactical Management and Base Management areas which reflects a score for the reported scoring period below the applicable SAC standard for the reported scoring period.
> . . . . . .
>
> An analysis will include reasons for the score below the SAC standard and a statement of corrective action taken or planned. Emphasis should be placed on cause, effect, and corrective action taken, or possible, at base level. If action above base level is required, a statement of that requirement should be made.
> . . . . . .
>
> Information contained in the analyses will be used in briefing the Commander in Chief, SAC, his staff and commanders and staff at all levels.[33]

An example of the analysis is shown on pages 34 and 35 of this study.

TAC's regulations are similar, and are as follows:

> An analysis . . . will be prepared for all elements scored below the Analysis Criteria Score (ACS) published by Hq. TAC.
> . . . . . .
>
> If the remarks section of the TAC-T12 [Aircrew Status and Training] report gives adequate coverage of elements in the operations area . . . additional analysis will not be required. Otherwise, the Management Analysis officer will prepare and submit an analysis on these elements as required.[34]

A sample report is shown in Figure 2, page 36.

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[33] Ibid., p. 3-8.

[34] Headquarters Tactical Air Command, op. cit., p. 173.

System Audits

The basic regulation for the SAC Management Control System provides for internal audit of all information passing through the system. Intermediate command headquarters perform periodic post audits, and all scores received by Headquarters SAC Management Analysis Division are subject to review and audit. This audit normally entails a comparison of statistical data with source reports, the accuracy of which are backed by military law. An independent check of the system comes as a by-product of the operational readiness inspections. General Pearl explains their function this way:

> The best independent checks that we can turn to are the operational readiness inspections made by the inspectors general of both intermediate command and command levels. Their inspections are not a part of the Management Control System. They are unannounced and require the units to generate aircraft and crews according to the emergency war order. Detailed observations are made of the performance of aircraft crews, maintenance, and all ground support activities . . . .
>
> Overall results, year after year, show that the Management Control System is a fairly good indicator of the units that are going to have trouble in an operational readiness inspection. Several items have been added to the system and point weights have been adjusted because of problem areas uncovered by operational readiness inspections, and integrity of reporting is a special item for investigation on every inspection. In addition to the operational readiness inspection, staff visits and staff surveillance give independent checks on the Management Control System.[35]

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[35]Pearl, op. cit., pp. 22-23.

Conclusions

This analysis is based on necessary features of a military control system. Some requirements, commonly accepted as essential to a control system, have been omitted and could support a solid argument in favor of their inclusion here. Most notable is the requirement of economy. Certainly a control system cannot justifiably incur unlimited cost, and the rule-of-thumb is probably a good one which suggests the system should cost no more than the value of the increased efficiency caused by the system. In the case of a military system, however, this value, theoretically, could be that of the entire society which is protected by the military arm. Thus, any analysis would be burdened with numerous assumptions and generalizations.

On the basis of those criteria selected, the Management Control System measures up well. Nonetheless, the final test of any control system is how well it actually does its job. This depends not only on its technical foundation or on its orientation to objectives, but also on the people who are using it. Therefore, the next chapter is the result of interviews with people who worked within the MCS, and is a record of their evaluations of the uses and abuses of the system.

CHAPTER IV

SURVEY RESULTS OF PERSONS USING THE MANAGEMENT CONTROL SYSTEM

This chapter describes the mechanics of the survey which involved people who had experience with the Management Control System. The comments of these people--both favoring and opposing the control system--are reported in abridged form. Finally, their comments are analyzed and interpreted to measure their evaluation of the effectiveness and efficiency of the Management Control System.

I. OBJECTIVES AND TECHNIQUES OF THE SURVEY

The objective of the survey was to secure a broad sampling of opinion from people using the Management Control System. It was hoped that the respondents, through their familiarity with both the theory and practice of the system, could offer insight into its achievements and needs. Therefore, key personnel in both command and staff positions were interviewed. Over thirty people from both SAC and TAC were contacted either personally or by mail. Those interviewed were selected on the basis of their positions, their familiarity with the control system, and their availability. Included in the group was one wing commander, one base

commander, two commanders of operations squadrons, three of maintenance squadrons, and one of a support squadron. Staff personnel interviewed included one management analysis officer from the headquarters each of TAC and SAC, five wing-level management analysis officers, one chief of a bombing and navigation section, and a wing deputy-commander for operations. The remainder of the respondents were serving in various line and staff positions.

All interviews were conducted on a confidential basis, and in all cases, they were unstructured. The respondents opinions, and his reasons for these opinions were solicited on standard questions which included the effectiveness of MCS, the efficiency of the system, the organization needs, the climate of control, and general impressions of MCS. A format of the interviews is included in Appendix B. The interviewer attempted to elicit reasons for both positive and negative responses, and in most cases was successful. Generally, the interviewer began by briefly explaining his interest in the subject. This was not thought to induce a bias due to the subsequent frankness of responses as well as the fact that in all cases but two, the respondent outranked the interviewer. The respondent was then questioned about his general opinions of the control system, and finally about specific points from his

general statement.

The major source of bias seemed to arise from the daily contact of the people with the Management Control System. That is, several respondents opposing the system had been criticized by their superiors for below standard performance the same week the interview took place. This condition had been high lighted by the MCS. On the other hand, the most eloquent spokesman for the system was a management analysis officer who had been required to defend it only two days prior to the interview against the arguments of three officers senior to himself.

Thus, the Management Control System is seen to evoke rather strong opinions from those using it. The following section contains a condensation of the major reactions to the system. They are generally paraphrased and in most cases reflect the opinions of several of the respondents.

II. RESULTS OF THE SURVEY

Favorable Opinions

Coordinative feature of MCS. One of the most adament exponents of the system was a wing commander who stressed the coordination of functions possible with MCS. While he believed there were additional advantages and even

disadvantages, he felt this one feature justified all the effort required to operate the system. He stated it in this way:

> With the number of considerations involved in running a wing, it is simply impossible for me to personally monitor all of them. My commanders do a fine job with their outfits, but each is principally interested in his outfit and puts most of his effort to building it up. MCS broadens their awareness for wing problems, and they can see how their outfit contributes to the wing effort and is a part of it.
>
> From a wing standpoint, the staff tends to fragment the total operation into specialties, but MCS again helps to balance the effort and emphasis which we place on the operation.

This same need for a balance of effort was recognized by an operations staff member. He pointed out the active interrelationship between the functional areas. Although his responsibility rested solely with helping the air crews prepare for their flights, he spent almost one-fourth of his duty time working with the maintenance section responsible for the repair of the electronic equipment with which his crews were concerned. He believed his efforts contributed to a higher degree of equipment reliability which raised the MCS score of the maintenance area. On the other hand, his crews were able to complete their training requirements in a shorter time and with greater accuracy due to the better equipment. Had this officer gone no further than his assigned responsibility, both areas would have suffered; more important, the utilization and efficiency of training time would

have decreased.

Informational feature of MCS. Officers at both headquarters and field levels expressed an appreciation of this feature but from slightly different viewpoints. Several line commanders felt that the Control System gave them an accurate indication of how well their units were performing. Each depended on the system for the information necessary in adjusting operations.

"I can get," stated a squadron commander, "the same information from other places, but it won't be as easy to find, and I might overlook something important in the process." Although he believed his organization was small enough--he commanded forty men--to personally check on everything that his men did, he used MCS to verify his observations and to gain a perspective in relation to collateral units.

An officer who had served in a headquarters staff position told of the use of MCS in that position.

> We didn't use any of the MCS data in our analysis [of personnel manning], but we did use the basic scores to find out whether a wing was hurting for people to the extent its operation was suffering. If they were doing the job with fewer people than authorized, they would be pretty low on our manning priority. . . .
>
> Now the way MCS is set up, they would be losing points for having vacant positions, but they couldn't do much about it unless we sent them people.

The wing commander quoted previously felt this feature was necessary ". . . as a positive check on the squadrons. All my commanders are capable, but when The General [apparently referring to his immediate superior] calls, he wants concrete information--not impressions or opinions!"

MCS as an aid to planning. The most significant favorable response was for the use of MCS data in planning. Ten of thirty-one respondents rated this the most important use of the system. Nine men stressed the importance of the wide range of data available, but admitted they seldom used any other than that pertaining to their functional duty.

A deputy-commander for operations told of the extensive use of MCS data in their planning.

> At the start of each [training] period we take a close look at the past performance of each [flight] crew extending back as far as five or six quarters. By analyzing their record, we can pretty well tell how many sorties they will need to finish their [training] requirements. How well we predict their actual requirement will have a terrific impact on schedule fluctuations toward the end of the period.
>
> Without MCS these decisions would be pure guesswork. . . . Of course, if MCS didn't exist, we probably would develop something ourselves which would be very similar to what we have now.

Other beneficial features of MCS. A number of features

of MCS were believed beneficial by those questioned. Two persons felt the system to be a valuable means of motivation. One stressed the importance of its contribution to personal motivation. He related how the system enabled the commanders of the units being rated to accurately measure their own performance, thereby encouraging still better performance in subsequent quarters. The other person believed the ranking of collateral units established the basis for the intense competition among the units which typifies the operation of both SAC and TAC. This he considered essential to top performance.

A management analysis officer singled out for special comment the standardization of reports which resulted from MCS. To him, this feature was the foundation for other benefits such as coordination, information, and others. All of the information compiled by the Management Control System is available in other separate reports. The harnassing of this information into a meaningful form, he believed is basic to whatever operating efficiency the commands possess.

Unfavorable Comments

The observation made previously in this chapter that MCS evokes strong opinions about its value is nowhere more apparent than with those who oppose it. Their arguments are fairly standard, and in only one case was an adverse reply

accompanied by a solution to improve the control system. Most respondents objecting to this system felt it should be discarded. Their objections fell into three general categories.

MCS emphasizes scoring rather than performing. Four officers related different stories which fell in this category. One told of an experience in a B-47 wing. During the pre-flight inspection of the plane, the navigator/bombardier of the flight crew discovered his radar set to be completely inoperative. Electronics technicians were called, and after checking the equipment determined that several hours would be required to repair the set. With scheduled take-off time approaching, it was determined that fewer MCS points would be lost by launching the sortie as scheduled even though the crew could not accomplish any of its planned training. Substitute training was not possible for other reasons. So the time of the flight crew, the cost of flying the plane, and the time the radar technicians could have been repairing the equipment all were wasted in order to salvage MCS points. The person telling the story claimed similar occurrences were not infrequent.

A maintenance squadron commander described a current practice in their wing management control system. While

it is hardly as wasteful as the previous example, it is very similar in nature. In order to encourage active participation by all squadrons in the suggestion program for improving performance and procedures, the item has been included in the wing control system. After the scoring criteria were established, the squadron commander required each of his men to submit one suggestion to him. Quality or merit of the suggestion had no bearing on the requirement, and quantity alone is the measure for acceptance. The commander now has a reserve of suggestions which he rations out each month at the required rate to receive maximum points, and believes every other squadron commander does much the same thing.

Each of these examples demonstrates a pressure to do what is expedient even though it may not be the most prudent or reasonable thing.

Standards are not fair. Closely allied with the complaint just discussed is this one concerning standards. The problem is bound to be present to a greater or lesser degree in any rating system which is not fully accepted by each person being rated. By the very nature of the commanders' review panel, the setting of standards becomes a representative process rather than a democratic one. A typical complaint is that those being rated have little or

no control over some of the items in the system. An example is the Officer and Airman Manning in Required Specialties, an item in the TAC system. Each of these items measures the number of officers or airman actually assigned in required specialties against the number authorized. This would seem to be an inducement for commanders to see that those individuals in areas which are over-manned are trained for those areas which are under-manned. Yet, overages are so rare as to be almost non-existant, and shortages are filled only when headquarters assigns additional people. Thus, the local commander can only request additional people and accept whatever score his unit happens to earn.

Another complaint is that a rating system is unrealistic which sets the standard at one hundred per cent. If a majority of units can score very close to a standard such as this, it would indicate that the item could reasonably be excluded from the rating system as further motivation is unnecessary. Such an argument, of course, excludes the need in certain areas for continuing command emphasis due to their great importance.

MCS encourages dishonesty. Each of the preceding two complaints--improper emphasis and unfair standards--is blamed for causing dishonesty throughout the control struc-

ture. One theory attributes the dishonesty to a lack of acceptance of the controls imposed by the system. This could be caused either by a fundamental weakness in the control system itself or by a failure by those using the system to recognize its possible benefits. The result of this is a pyramiding of controls to combat the attempts of the individual to escape them.

A second explanation for the dishonesty is the intense competition which has developed in SAC and TAC among their subordinate units. Critics of the Management Control System point to it as the direct source of this problem. "You can date our problems of 'pencil-rolling' and 'back-stabbing' to the time MCS was forced on us." This bitter invective came from the most critical of all the individuals interviewed. Surprisingly enough though, he still felt that the wing in which he served was more effective since the control system was adopted. Each respondent was asked to rate the relative effectiveness and efficiency of pre-MCS with post-MCS operations; the substance of their replies follows.

Appraisal of MCS Effectiveness

The recent installation of MCS in TAC afforded many of its members an opportunity for an appraisal of the system not available to those in SAC. One of the most fortuitous opportunities to evaluate the SAC system occurred in 1958

when SAC assumed command of McConnell Air Force Base, Kansas from the Air Training Command (ATC). One officer was interviewed who had served at the base as a flight instructor during the period of changeover. His first two years at the base were under ATC and his last three under SAC with the MCS.

The primary mission of the base during his tour of duty was to train B-47 flight crews for the combat wings. He told of a stepped-up training pace under SAC. He believed more students were trained by fewer instructors; the aircraft were flown for longer periods of time with less ground time taken to prepare them for the next flight; reliability of the equipment improved; and everyone seemed to work much harder and more diligently.

This improved effectiveness was not restricted to the operations and maintenance areas. The Management Analysis Division of Headquarters Strategic Air Command ran a survey on four items from the McConnell AFB management control reports. The first scores under SAC direction were compared with those four years later. Percentage of points earned to the number possible was used as the basis for comparison. The results[1] were as follows:

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[1]All figures were supplied by Col. D. W. Rulien, Chief of the Management Analysis Division of Headquarters SAC in a letter dated 13 May 1964 to Capt. Bennett Zinnecker.

	March 1959	June 1963
On-The-Job Training	78%	100%
Office Open Mess	80	100
NCO Open Mess	70	100
Ground Safety	50	80

None of the remaining evaluators of MCS effectiveness in SAC had the advantage of comparison that was possible in this one instance. However, every respondent from SAC, whether favoring the control system or not, considered the operation to be more effective due to MCS. The reasons given for this condition were essentially those presented as favorable opinions, namely better coordination, information, and planning.

Out of the fourteen evaluations of the SAC system, eight persons deemed the operation less efficient due to MCS. This they attributed to an occasional pursuance of a good MCS score rather than the unit mission. The factors which entered into this evaluation were improper emphasis, unfair standards, and dishonesty in reporting.

All the TAC personnel who were interviewed had witnessed basically the same operation with and without MCS. Sixteen of seventeen believed MCS to have increased their unit's effectiveness with seven making reservations about their appraisal. Each of these seven recognized

improvement in general, but felt it varied in extent among the areas. The operations area was identified as benefitting the most with maintenance second and the support area last. This sequence matches the amount of command emphasis given each area as displayed in the MCS point allocation.

MCS's contributions to efficiency was judged by TAC people to be better than was the case with SAC people. It should be recalled that the TAC people had a better basis for comparison than the SAC people due to their recent adoption of MCS. Fourteen of the sixteen persons who judged the operation more effective also could see greater efficiency, and they put the gain mostly to better coordination among collateral units and better information of what was desired by higher headquarters. One respondent was particularly impressed with the improved exchange of information between command echelons. He said:

> Before we had MCS we used to send in reports of man-hours spent in repair and inspection of the planes, and frankly, they were pretty poor compared to other wings I've been in. But, nothing was ever said by Headquarters, and quarter after quarter our performance stayed about the same.
>
> Well, since Col. _____ [the present wing commander who took command of the wing shortly after MCS was adopted] has been here, a number of people have been wanting to know why our performance is so low. It has been getting better right along. . ., but we still take a beating in the scoring.
> . . . . . .

I guess if we didn't have MCS we still would be doing just about the same as before.

III. ANALYSIS OF THE INTERVIEWS

The most difficult part of analyzing comments about a subject as controversial as the Management Control System is that of separating the rational response from the purely emotional one. The existence of such a varied response seems to equate with the profound difference of impressions which individuals have formed of the control system. Some of this can be explained by the varied backgrounds and training of the individuals. The person who prefers a large degree of independence of action is bound to encounter many frustrations in either S C or TAC. Standardization, coordination, and prompt compliance with orders are "built-in" characteristics of both commands; and the person who instinctively seeks to reject these constraints is apt to react negatively to their most obvious manifestation. In many cases, this would be the Management Control System.

Nonetheless, apart from the individual who is fundamentally incapable of fully accepting central control, still there exist a number of people who resist control in their work environment, but who would heartily accept it in a different environment. In other words, the climate

of control can make the total difference of whether those being controlled will accept it or reject it. With this as a hypothesis, many of the dissimilarities of views recorded in the interviews begin to assume a meaningful pattern.

The case of the wing commander who believed the MCS fostered coordination is now seen to be the reaction of a man who is primarily concerned with using the system as a tool to aid him in the performance of his duty. Although his superiors are maintaining surveillance of his performance with MCS, he obviously does not consider it a constraint of his latitude of action. Similarly, those who favored the system as a vital source of information and a valuable aid to planning, are reflecting the positive attitudes of men looking for solutions to their problems. They are expressing an intrinsic acceptance of some objectives, and are willing to use any tool or technique which promises to further the attainment of their goal. They perceive the climate of control to be friendly and permissive; one which encourages personal initiative and responsibility. This is contrasted with those who saw the Management Control System as a limit to their authority.

Each of the comments expressing dissatisfaction with the control system reveals a quest for some way to "beat

the system" due to the intense competition among collateral units rather than for accomplishing the unit's objectives. Each implies a resistance by the individual to what he considers to be unwarranted infringement of his prerogatives. The abiding element of the criticisms is this resistance to control. The way in which MCS pervades the organization makes its effect even more onerous to those who feel restricted.

So the quandary remains of how to explain the existence of such radically different interpretations of the climate of control. One solution could be to delineate the various uses of MCS (such as a method of standardization, of motivation, of evaluation, etc.), and determine which uses produce a positive effect and which have a negative effect. The main obstacle to this approach is one of the most significant findings of this study. It will be recalled that in an earlier portion of this chapter, motivation was rated both as a favorable and as an unfaverable product of the control system. Further, these ratings were based on observations of the same organization, during the same period of time, and so with the same overall climate of control.

Thus, an important conclusion emerges that the climate of control surrounding the Management Control System depends,

to a significant degree, on what each individual construes it to be. It is not enough that a commander intends for his control system to be used in one way or even that he publish explicit instructions on its pervue and use. If the subordinate is not receptive to these instructions, there is little chance that he will discover the commander's intended meaning.

This problem of communication is complicated by the many uses of MCS. One use will reasonably take precedence over the others as the individual sees indications of command emphasis. He might also evaluate the climate of control by studying official pronouncements in the form of regulations, manuals of procedures, or stated command policy. His conclusions, undoubtably, also will be influenced by what he observes to be the results of the official position. The command attitude regarding subordinate's mistakes and the method of handling them, will have central import in the assessment of the control system.

These findings regarding the acceptance of the Management Control System can be summarized as follows:

1. The acceptance afforded the system will be influenced by the personality of the individual.

2. The individual's understanding of the workings and uses of the control system will result as much from what

he senses as from the official explanation of these things.

3. The control system will mean different things to different people.

4. The manner in which mistakes are dealt with by those in positions of authority will be a prime determinant of the climate of control.

Effectiveness and Efficiency of the System

The conclusions just listed are useful when analyzing the personal appraisals of the Management Control System's efficiency. Most of those who felt the system to be less efficient attributed this to the pursuance of wrong goals by individuals in the command. These individuals who have been judged guilty of wrong actions are actually guilty of striving for goals different from those of the person making the appraisal. Unfortunately, this study did not determine who was oriented toward the unit's mission and who was oriented to other objectives. Thus, the respondent's judgment of MCS's efficiency could be primarily a direct reflection of his mental image of the system. In the case of that majority (eight of fourteen) of SAC people who felt MCS to be inefficient, it must be noted that none of the respondents had observed their unit operation under some control method other than MCS. On the other hand, those in TAC who had a basis for making an

accurate comparison of efficiency in the same unit, responded positively in preponderant numbers (fourteen of sixteen). With trends as significant as these, it must be reasoned that a partial explanation of the SAC figures is due to the human propensity to disregard or depreciate the value of something if the value cannot be easily measured or understood.

The overwhelming positive rating of increased unit effectiveness due to MCS is significant in itself and requires no further comment. That the degree of effectiveness varied between the Operations, Maintenance, and Support areas can be explained by the lesser amount of command emphasis as exemplified by the relatively small number of points allotted the Support area by the control system. While this study made no attempt to assess the propriety of the point allocation, the fact that a number of respondents identified this de-emphasis indicates a need for follow-on study directed at the problem, but superficial analysis would seem to support the current allocation on the grounds of mission orientation.

As a comment of the interviewer's general impression of those interviewed, he was favorably impressed with the depth of understanding possessed by most of the respondents concerning the implications, uses, and operations of the

Management Control System. While many of them disagreed with the way the system was being used, in most cases they were clearly aware of command intentions as expressed in the implementing instructions. Most responses--both favorable and unfavorable--revealed a far greater appreciation for the problems concerning control than was expected at the outset.

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter contains the major findings of this study. From these findings, conclusions are presented regarding the Management Control System's applicability to other military organizations and its effectiveness and efficiency. The chapter concludes with some suggestions for changes to the system.

I. SUMMARY OF MAJOR FINDINGS

The Management Control System as used by the Strategic Air Command and the Tactical Air Command is a pervasive, dynamic force in their operations. It measures a multitude of varied facets of the organizations, and is both praised and condemned for the way in which it accomplishes this. The wide variance of opinion regarding the worth of almost every feature of the system is noteworthy for the difficulty it imparts to any analysis of the system.

This diversity of opinion is partially traceable to the varied uses of the control system. Thus, a response might be aimed at the system's informational feature, its motivational feature, or its purely control feature.

The other source of discord is the different climates

of control which pervade the MCS in different component organizations. An integral part of this factor is the degree of success which the unit commander has in identifying and communicating the unit objectives. The lack of adequate communication between successive echelons contributed to the adverse opinions of MCS through misunderstandings of policy concerning the system.

Features necessary to the success of a military control system were identified as (1) reflecting the nature and needs of the organization, (2) timely, (3) flexible, (4) forward looking, (5) limited to strategic points, (6) point up exceptions, and (7) assure corrective action. These features could be used to test the adequacy of any military control system, and should aid in detecting and analysing possible deficiencies where they exist. Such an approach, however, will not assure a successful system. The prime ingredient in a responsive control system, the one which provides the impetus for all action, is the acceptance and understanding of the system by the people using it.

The overwhelming majority of persons interviewed, all of whom occupied key positions in their respective organizations, seemed to have a firm understanding of basic concepts of control. Those who deprecated the system did so on the grounds either that it failed to satisfy the needs of the

organization or that it was being misused by superiors. The apparent inconsistency of the system being criticized for not meeting the needs of the organization, yet still being rated effective by most of those interviewed can be explained in the same way as was the low ranking of efficiency by the SAC people in the last chapter. The bias against the system approached being a grudge in some cases, and it is felt the individuals were reacting emotionally rather than rationally to the questions.

II. CONCLUSIONS

The Efficiency and Effectiveness of MCS

Whether examined against a theoretical, ideal framework; by compiling the opinions of people who have used it; or from the very limited quantitative data supplied by SAC Headquarters; the system <u>seems</u> to provide the overview necessary for commanding the organizations. The word "seems" is underscored because of the way in which the case for the system was built. While the case is not proved by this study, still the preponderance of evidence indicates that the control system is valid.

The very fact that it is effective compounds its damaging effects when it is misused. A solution to the potential danger of misdirection of the system is formulated later in the chapter.

Applicability To Other Military Organizations

The main requirement which MCS seeks to satisfy is that of contributing to good management, and this is necessary in any military organization regardless of whether its mission is for combat or for support. Certainly the control system could not be applied intact to another major command such as the Military Air Transport Service (MATS); each command has needs peculiar to its operation, and so requires a tailored control system. However, the flexibility of the Management Control System would facilitate its being tailored to the needs of each organization. The greatest single advantage of the system is its capacity for establishing a common measure of performance where none naturally exists, and this is needed to a greater or lesser degree by all commands.

Means for Improving The System

A prerequisite to the successful use of any management control system is its sincere acceptance at all echelons of command. Therefore, any solution to the problems identified by this study must be directed at the sources of dissatisfaction which, with MCS, are its climate of control and its varied uses.

Improving the climate of control. It has been well established by management authorities that the prime reason

for restrictive administration is a lack of sufficient confidence in subordinates. For the purposes here, it is unimportant why the lack of confidence exists. What is important is that once one level of authority imposes tight controls on a lower level, nowhere down the chain-of-command will the restriction be loosed. Therefore, it can be said that the atmosphere of control of the lowest level is at least as confining as that of any level senior to it.

This pyramiding of constraints has important implications in the Management Control System. Excessive restriction at the operational level will be seen as general dissatisfaction with the control system, but the cause of the condition may exist several levels above the place where the damage is manifest. Thus a local commander may be well aware of the adverse effects of his control, but still be unable to ease it due to restrictions placed on him by his superiors. Before any easing of excessive control can occur at the operational level, the way must first be cleared by at least a consideration to easing all the way up the command structure, and a solution may involve a change of attitude at the very top level.

A second complicating factor in the determination of the climate of control is the variance of personal interpretations given it by different people. What one person deems

restrictive, another may deem adequate, while still another may consider lenient. Unfortunately, no adequate standard exists which allows a finite measurement of the "actual" amount of control being used in a given instance or even of what amount of control is most advantageous. Therefore, the best that can be said of the factor of the control climate is that it must remain a matter of judgment, but commanders at each level should review their policies toward the lower echelons and remove all unwarranted constraints.

Identifying and simplifying the uses of MCS. Closely akin to the problem of maintaining a proper climate of control is that of determining the uses which this system will serve. In the case of MCS, the implementing instructions clearly define the design uses. Firstly, the system is designed ". . . to reflect effectiveness, evaluate performance and isolate problem areas to assist management in decision making."[1] In other words, this is the function of control as defined in Chapter III of this study. Secondly, "managers at all levels of command . . . use MCS as a primary source of information to aid in decision making."[2]

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[1]Headquarters Strategic Air Command, SAC Manual Number 170-2, Vol. I [SAC Management Control System] (Offutt Air Force Base, Nebr., January 1964), p. 3-2.

[2]Ibid.

These are the only two uses given by the SAC manual governing the system, and the TAC instructions, likewise, cannot be interpreted as providing for more than these. General Albert Pearl, as the Comptroller of the Strategic Air Command, has described the system as a motivator in this way:

> The Commander in Chief SAC from the beginning has used the Management Control System to motivate commanders to give emphasis to certain important areas and to achieve certain standards of performance in these areas.[3]

In this context he is saying that the system is used to relay information and act as a control on operations which is exactly what the regulations provide for. Yet, the General goes further and describes the system as a means of rating or ranking subordinate units. Experience has shown that when one unit is compared with others, competition will usually occur. So in this context also the system is used for motivation. Each of the individuals interviewed for this study was clearly, and sometimes painfully, aware that the system does promote intense competition. Both SAC and TAC have vigorously pursued the motivating feature as an unstated but widely used tool.

Unfortunately, this approach shows a profound

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[3]Albert L. Pearl, "The SAC Management Control System," Air University Quarterly Review, Vol. XIII, No. 4, Summer 1962, p. 21.

ignorance of control in its purest use which is what the regulations claim for the Management Control System. The essense of pure control is self-imposed regulation to stated policies and standards. Yet as soon as the element of competition is added to the control system the focus switches from the standards to a comparison with the performance of one's competitors. The new goal is that which is most visible--a good rating; and the function of control, which presumably was the reason for originally implementing the system, becomes secondary.

This condemnation of competition is not meant to infer that there is no place for it in the organization. On the contrary, it is an important element in the administration of almost any enterprise one can imagine. However, when mingled with control, it becomes a destructive force negating the purposes of control. Numerous other means for competition among the units are currently available to both SAC and TAC, but the same is not true of control. No other comprehensive method for management control exists in either command. Still, it is only necessary to review the unfavorable comments from the interviews to recognize the debilitating effect of the rating feature. Each complaint is directly related to this problem.

Thus, a simple, but effective, solution to the present misuse of MCS would be to cease using it as a competi-

tive rating system. This could be attained merely by not revealing the scores of collateral units. The control system could then function in the manner for which it was intended, and commanders at all levels could use it as a tool to improve their own operation rather than as a measure of how much or how little other units are doing. The climate of control also would doubtless benefit from the change.

Another point in favor of this solution is that the motivation arising from the competition between units need not be relinquished. Any number of alternative sources for comparison could be used. These include the Operational Readiness Inspections, special composite wing training missions, or any other effort which is centered on the unit's mission. The resultant rating would be far more meaningful than it now is with the inclusion of such things as bar profits and news releases.

At the same time the Management Control System is relieved of its rating function, the items included in the system should be reviewed with the intention of eliminating those over which the local commanders have little or no control. Unless it is clearly possible for the unit to achieve the standard for an item, the item should be discarded from MCS. Retaining items for which performance is "understood" to always be substandard ineffectuates the

entire process of control. Control necessarily involves correcting to standard, and if attainment is impossible, the standards must be changed or the item thrown out as a waste of time and effort.

Concluding Remarks

The Management Control System has all the elements necessary for it to be an invaluable aid to those who manage the men and resources of the Strategic Air Command and the Tactical Air Command. Some of its functions are abused, but these can be quickly and economically remedied. With these abuses corrected, the system could contribute to its full potential to the building and maintenance of a winning counterforce.

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APPENDIXES

APPENDIX A

DEFINITIONS OF TERMS USED

Sortie: A flight of a single aircraft which simulates or accomplishes penetration of enemy-held airspace. During peacetime, it is a training flight for the purpose of practicing tactics to be used in combat. A sortie is normally considered flown by a bomber or fighter.

Materiel: Things of all kinds required for the equipment, maintenance, operation, and support of military activities, both combat and noncombat. Also, those things used in combat or logistic support operations, as weapons, motor vehicles, airplane parts, etc., as distinguished from items of ordinary use, such as uniforms, food, bedding, medicines, and similar items.

Operation: That which a person or group of persons is expected to do in terms of the mission and the overall function assigned to them. In the plural, usually capitalized, it is a major subdivision of certain headquarters, headed by a deputy responsible for advising the commander of his overall operation (sense 1). Also, it may refer to an activity that controls and coordinates the flying and associated activities of an air base. It is in this latter sense that the term is generally used in this thesis.

Mission: Any particular business, service, or duty assignment to be accomplished by a person, organization, or the like, with the object of contributing functionally to an overall objective.

Effectiveness: In the sense used in this analysis, the term refers to the ability to provide a desired effect. Almost without exception, this effect is the unit's mission.

Efficiency: This term denoted the measure of the economy of men and materiel in the accomplish. ent of a desired effect.

APPENDIX B

GENERAL FRAMEWORK OF INTERVIEWS

Background Information

1. What is the respondent's duty assignment?
2. How has his job been going the last week? Smoothly, roughly, nothing noteworthy, etc.
3. How long has he used MCS?

~~Effectiveness and Efficiency~~

1. Effectiveness is a measure of how well the unit accomplishes its mission. Is the operation more or less effective due to MCS? Why?
2. Efficiency is a measure of how economically the unit's resources are used in pursuance of its mission. Is the operation more or less efficient due to MCS? Why?
3. Is MCS a significant factor in the unit effectiveness or efficiency?

Features of MCS

1. What are the most favorable features of MCS?
2. What are the least favorable features of MCS?
3. What are the current uses of MCS? or What are higher headquarters trying to accomplish with MCS?
4. Could the system be improved? How?