



ARI Research Note 86-83

AD-A170 948

FORMATIVE EVALUATION OF A  
SOCIOTECHNICAL SYSTEM INTERVENTION  
AT AN ARMY MAINTENANCE DEPOT

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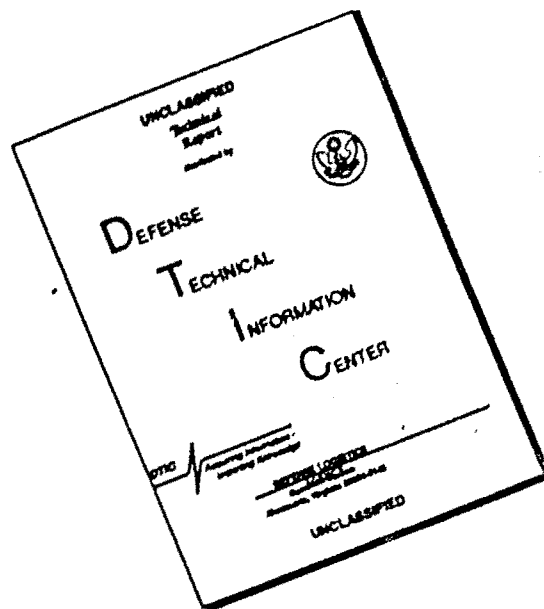
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER ARI Research Note 86-83	2. GOVT ACCESSION NO. AD-A170948	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Formative Evaluation of a Sociotechnical System Intervention at an Army Maintenance Depot	5. TYPE OF REPORT & PERIOD COVERED June 82 - May 84	
	6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) Paul van Rijn (Editor)	8. CONTRACT OR GRANT NUMBER(s) --	
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue, Alexandria, VA 22333-5600	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 2Q162722A791	
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue, Alexandria, VA 22333-5600	12. REPORT DATE July 1986	
	13. NUMBER OF PAGES 376	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) --	15. SECURITY CLASS. (of this report) Unclassified	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE --	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) --		
18. SUPPLEMENTARY NOTES Paul van Rijn; Army Research Institute technical point of contact. Telephone: (202) 274-8293, AUTOVON 284-8293		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Organizational Change                      Quality of Working Life Sociotechnical Systems Design            Measurement Productivity                                    Organization Survey		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This research note describes in detail the sociotechnical intervention that was conducted at the Corpus Christi Army Depot from 1982 through 1984. The note consists of a series of seven formative evaluations describing and analysing the organizational change process as it unfolded at the Depot. The development of an archival and survey measurement system to help assess the impact of the intervention on the productivity and quality of working life at the Depot is also included in the report.		

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FORMATIVE EVALUATION OF A  
SOCIOTECHNICAL SYSTEM INTERVENTION  
AT AN ARMY MAINTENANCE DEPOT

INTRODUCTION

Paul van Rijn

The purpose of this research note is to describe, document, and evaluate the process of the sociotechnical systems design intervention that was conducted at the Corpus Christi Army Depot (CCAD). This report is a compendium of seven separate and distinct formative evaluation reports which describe successive phases of the project. Although the evaluations were designed primarily to document the intervention, they also served to provide ongoing feedback about the intervention process to CCAD. The level of detail is likely to be useful for anyone who is interested in conducting this type of intervention.

It must be recognized that these evaluations are heterogeneous. Not only were they written by two ARI researchers, but they reflect the changing focuses as the project matured from stage to stage. Consequently, there may not always be obvious transitions from one evaluation to the next. This is also due, in part, because these evaluations were more than an independent outside assessment of the project. They were also working documents that provided direct feedback to the depot about its performance. Consequently, they were an integral part of the intervention itself and included, wherever possible, recommendations and suggestions to help shape and facilitate the intervention.

The sociotechnical intervention at CCAD, called STEP for Socio-Technical Evaluation Program, was part of the Army's continuing effort to improve productivity. Most of these efforts to improve productivity focus almost exclusively on technological rather than people-oriented interventions. There are some notable exceptions, such as the organizational effectiveness program (now being phased out), productivity gainsharing, and quality circles. Sociotechnical systems design is most closely aligned with these latter programs in its explicit recognition of the human factor as a most important contributing factor to productivity.

Sociotechnical Systems Design

Sociotechnical systems design is a participative management technique that is based on the belief that managers and workers can most effectively accomplish their shared goals and objectives through cooperation, collaboration, and collegiality. It is a systems and macro-level approach predicated on the assumptions that the purposes of the organization must be articulated clearly and that high performing organizations can best be designed by optimizing both the technical and social (worker-oriented) aspects of the organization. At the heart of sociotechnical systems interventions is the

principle that organization will function optimally only if the social and technical systems of the organization fit the demands of each other and of the environment.

Sociotechnical systems design consists of five basic phases: the system scan, the technical analysis, the analysis of key variances, the social system analysis, and the development of recommendations for optimizing the technical and social systems. To better understand these phases, each will be briefly described.

The systems scan is an overview of the organization. During this phase, the purpose, values, and beliefs of the organization are clarified. The organization is viewed and analyzed as an open system, consisting of interrelated components and operating within an external environment from which it receives inputs. The organization must efficiently transform these inputs into the outputs that are valued by the external environment. If this is not done efficiently, or if the organization does not adapt effectively to changes in the demands of the environment, it will inevitably bankrupt itself and fail to survive.

The technical analysis phase focuses on the tools, techniques, skills, knowledges and other devices that are used by members of the organization to accomplish the goals and objectives of the organization. Major transformations of the inputs are defined during this phase.

The analysis of the key variances derives directly from the technical analysis and consists of the identification of the major deviation from the norm. These are deviations that must be controlled for the smooth and even flow of the transformation process.

The social analysis phase focuses on the work-related interactions among people. It examines who talks to whom and delineates to what extent and where formal organizational boundaries are dysfunctional and suboptimal. Organizational roles, both formal and informal, are identified and an analysis is made to determine to what extent the various roles meet the personal goals of the members of the organization.

During the recommendation or design phase, information from the preceding phases is integrated to develop a set of recommendations that will jointly optimize the technical and social systems of the organization. Roles and organizational boundaries might be rearranged, new technologies might be introduced, focused or development training might be implemented, and to the extent possible, responsibility for control of the key variances is delegated to those workers closest to them.

These stages do not necessarily occur sequentially and tend to overlap considerably. In addition, these stages mean nothing without subsequent implementation of the recommendations. The organization must adapt and institutionalize the recommendations, sustain them, and periodically reassess itself to determine if the balance between the technical and social systems remains adaptive and responsive to the requirements of the environment--the customer.

Sociotechnical systems design is not intended to be a one-time intervention. To be effective, it must become an integral part of the planning, decision-making, and problem solving processes of an organization. It is a long-term change strategy that aims to optimize the functioning of an entire organization.

### Corpus Christi Army Depot

Corpus Christi Army Depot, CCAD, was the focus of this particular sociotechnical intervention and demonstration project. CCAD consists of about 400 employees--mostly civilian--who have as their primary mission the repair, overhaul, and maintenance of Army helicopters. The majority of the employees are in wage-grade occupations, many of a highly technical and specialized nature. The UH-1H helicopter is the mainstay of CCAD, and work is performed on all its components. However, because the airframe or structure of the UH-1H helicopter comprises the bulk of the work, the Airframe Division was specifically singled out to be the primary target for the sociotechnical intervention. The focus on this division of about 900 people helped make the project more manageable and, if successful, would permit ready generalization to the remainder of the depot.

Work within the Airframe Division is divided among approximately 60 Work Centers. Some are involved in the disassembly of the helicopter, others clean and rebuild the disassembled parts, e.g., the fuel system, avionics, glass, rotors, or tailboom, while other work centers have responsibility for the re-assembly and flight test. All work is highly automated and all parts are carefully tracked to ensure they will be available at the time of assembly. Scheduling the flow of work is a major challenge and quality inspections permeate the entire process.

### Project Background and Overview

Table 1 shows the chronology of major events for the duration of the project. This project was originally conceived as early as 1980 when the then Commander of the Depot System Command (DESCOM) attended a sociotechnical systems design course at the Organizational Effectiveness Center and School. During this course and in subsequent meetings between DESCOM, the Army Research Institute and DESCOM's parent organization, the Department of the Army Materiel Command (AMC), sociotechnical systems design was viewed increasingly as a useful management tool to enhance the productivity of Army depots and to help relieve Congressional pressures to contract out depot functions to private industry.

Although initially conceived as a demonstration project involving four depots, the project was ultimately limited to a single depot. Corpus Christi Army Depot volunteered and was selected to be the testbed for sociotechnical systems design, and in early 1982 a contract was awarded to Sociotechnical Design Consultants, Inc. to implement the intervention at CCAD.

Many players are involved in a project of this scope and all have their prescribed roles. The role of the consultants was to train the depot in the sociotechnical design process and to facilitate its application at CCAD. CCAD provided all the onsite resources and detailed a group of managers and em-

ployees to a STEP Design Group to work full-time on the project. DESCOM was the direct sponsor of the project, provided the funds and technical monitor for the contract, and demonstrated the supportive organizational climate required to make the effort possible. AMC maintained general oversight and support. Finally, ARI's role was to assist CCAD and DESCOM in the technical evaluation of the intervention through a series of formative (process) evaluations and a final summative (outcome) evaluation report.

During 1982, the STEP Design Group worked closely with the consultants. It conducted a systems scan of the depot, analyzed the technical and social systems--and their key variances--and then developed a comprehensive set of recommendations for improving the balance between the social and technical systems of the depot.

During 1983, most of these recommendations were implemented, some more than others. Since a large number of these recommendations involved training, the resources expended to implement the recommendations were considerable.

#### Project Outcome

The "bottom line" assessment of the intervention is of the utmost interest to the Army and will be an important component of any decisions to transport the technology to other Army units or installations. A detailed summative evaluation, i.e., an evaluation of the outcomes of the project, has been prepared and is published in a separate report. To summarize, although there were indications of positive change in the climate of the organization, it was difficult to demonstrate productivity gains that could be attributed directly to the intervention.

Demonstrations of tangible gains were difficult for a variety of reasons. Some of the difficulties were due to the unreliability of the measures themselves or their reporting system. Other difficulties were a function of the natural interdependencies among the measures and the relative weights or importance assigned to each measure.

Finally, because sociotechnical interventions are longterm, significant productivity gains may not be expected to be apparent immediately and may not emerge for a number of years. By then, situations will change and the momentum of the original implementation most likely be diminished. This is particularly true for military organizations, such as CCAD, where there are changes of command about every three years. Time also confounds any measurable effects resulting from the intervention as other initiatives, programs, and external factors continue to impact on the productivity measures being tracked. This makes it virtually impossible to attribute specific results to particular interventions or events. For example, during the first year of the implementation of the recommendations, a new automated shopfloor computer system was introduced and over 700 untrained new hires were brought into the depot workforce. This is certain to have an impact on the depot's productivity and quality of worklife. However, the nature and extent of the impact is highly elusive and resistant to quantification.



FORMATIVE EVALUATION I (FEB - MAY 82) OF  
THE SOCIOTECHNICAL EVALUATION PROGRAM (STEP) AT THE  
CORPUS CHRISTI ARMY DEPOT

Nehama Babin  
US Army Research Institute

Scope of the Evaluation

This evaluation covers the activities of the period beginning with the inception of Phase I of the Sociotechnical Systems Evaluation Program (STEP) at the Corpus Christi Army Depot (CCAD) and ending with the Systems Scan and the In-Process Review (22 February 1982 - 24 May 1982). The purpose of this project is to induce organizational change which will increase the productivity and quality of working life at CCAD. Sociotechnical Systems Analysis has been chosen as the technique to accomplish those objectives. Therefore, the purpose of this evaluation is to describe both the process and progress of the project to date and to determine if the appropriate steps are being taken to meet those goals. This report will include an assessment of STEP activities and any suggestions considered necessary to change the direction, scope, or nature of the project.

The activities which occurred during this period, are the following:

- Preliminary planning, coordination and development of STEP.
- Establishment of support and involvement of Corpus Christi Army Depot management and workers.
- Completion of the System Scan.
- In-process review (IPR).

The following sections will describe and evaluate each of these four activities.

Preliminary Planning, Coordination and Development of STEP

Description. The development of this project was a very complex process. First, five Army organizations are involved: US Army Development and Readiness Command (DARCOM), US Depot Systems Command (DESCOM), US Army Research Institute (ARI), Organizational Effectiveness Center and School (OEC&S), and CCAD. Each bears a different idea of the outcomes and purpose of this project, each with a different investment, and each with a different concept of its own role in this project. A critical first step in assuring the success of STEP was to coordinate agencies, define roles of participants and develop networks of communication.

Much of the coordination and definition of roles and objectives was achieved during a one-day meeting which took place 22 February 1982. During this meeting, representatives of ARI, CCAD, and DESCOM met with the team of consultants and sketched out the relationships and communication networks among participating agencies. Tasks were identified, and roles were assigned. It was decided that information for the Depots would be diffused through DESCOM by way of the Organizational Effectiveness Consultants, and information for OEC&S would come from ARI. The case study, which will be produced at the end of the project, will be used for general public dissemination of information about the CCAD project.

Another reason for the complexity of the project is the complexity of sociotechnical systems analysis itself. This technique for organizational change has five basic steps. However, underlying the simplicity of this technique are sophisticated mechanisms and procedures for understanding, analyzing and changing an organization. Furthermore, the technique is being applied to CCAD, an organization which has a workforce of 3,000 people, three unions, both military and civilian employees, and ties to both the Army and Navy. In addition, it is in a civilian township whose economy has depended on the functioning of the organization for years. The repercussions from any changes which the Depot incurs could be enormous. Therefore, there was concern on the part of the organizations represented at the 22 February meeting involved that procedures and methods be specified and described in detail.

During that meeting, in a question and answer session, the consultants described the technical specifications, the process of sociotechnical systems analysis as they plan to apply it, and related issues. Discussions covered the following areas: the nature of involvement of key groups at the Depot (e.g., the design group, the steering committee, the unions, etc.), the issue of the project "ownership," associated research and measurement, required resources, motivation for involvement in the project by members of the Depot, project payoffs, schedules, definitions of success, and choice of systems within the Depot to be analyzed. Although the consultants were able to answer questions and describe procedures, at that point in time most answers concerning sociotechnical systems analysis were at a general level. Specifics could not be stated until the consultants actually entered the Depot, did a preliminary scan and had preliminary meeting with key Depot groups. However, enough information was imparted to participants of the meeting about the technique and the Depot to gain a much clearer understanding of what would be happening so that related STEP activities could be planned.

Most important, the consultants described the philosophy which underlies sociotechnical analysis and intervention, and the tone of the project as they intended to implement it. The consultants tended to follow the traditional "Tavistock" method as Emery and Trist originally set out the technique. They regarded ownership of the project by the target organization (rather than sponsors, consultants, and parent organizations) as a critical factor in the success of sociotechnical systems analysis. The consultants saw their roles as teachers and instructors of sociotechnical systems evaluation techniques and as guides and counselors in the process. They also believed that there should be documentation of information and open communication among all par-

ties. Furthermore, it was suggested that a system of "institutional memory" be established in order that members of the organization could continue the sociotechnical process after the consultants have finished their part in the project and left the organization.

More specific information about the application of sociotechnical systems evaluation to CCAD was obtained later when the consultants went to the Depot and met with managers, the unions, and various other key groups. In preliminary meetings, the consultants briefed the Depot personnel about the project, and the Depot members provided information to the consultants about the Depot. Also during this period, the STEP design group was chosen and the diffusion of information throughout the Depot about the project initiated. The Depot newspaper, "The Aircraftsman," began to carry stories about STEP.

Finally, the consultants used this period to conduct a preliminary scan of the organization. The purpose of this scan was to determine roughly which section of the plant would be best to analyze. The scan was based partly upon personal observations by the consultants, and partly on information gained from the preliminary meetings. Based on the findings of the scan, it was decided that the major focus of the project would be the UH-1H helicopter system.

Evaluation. In a project such as STEP, due to the complexities, it is important to proceed with the utmost care and caution. As much as possible, all aspects of the project should be under control. The assessment at this point was that the project had a good chance of success because care, caution, and control were being exercised. The consultative process, as it had unfolded, had assured all parties concerned that the project would proceed on schedule in the prescribed manner. Coordination and communication between all involved parties was proceeding smoothly. Role definitions, although specified formally at the beginning in written documents, had somewhat changed and evolved over time. The "institutional memory" of the project was in the process of being installed. Two members of the Depot, the project manager and the organizational effectiveness consultant, through full, daily participation in all aspects of the project, were learning how to conduct sociotechnical systems analysis so that they could continue the process after the consultants had left the organization. The sociotechnical systems analysis steps and procedures were being followed very closely and carefully. Everything, so far, had proceeded as planned.

#### Establishment of Support and Involvement of CCAD Management and Workers

Description. In a project involving sociotechnical systems analysis it is imperative that members of the target organization not only be involved in the analysis, but also that they have a strong sense of ownership of the process and product of the project. Sociotechnical systems analysis is a participative technique to effect organizational change. Change should come from within rather than be imposed by forces external to the organization. Also, it is important that the target organization wants change. Otherwise there may be a considerable amount of resistance. Consequently, it is impor-

tant to gain support and involvement of both management and workers. Support was developed in several ways. At the very beginning of the contractual period, the consultants met with top management at CCAD in order to brief them thoroughly on STEP. In addition, a two-day training session on STEP was held for division managers in order to educate them on the technique, enlist their support, and help them to identify and define their roles in the project.

Engagement of the participation of other members of the Depot was done through the establishment of a "design" group whose 12 members represent all levels and divisions of the organization. In sociotechnical systems analysis, the design group is the vehicle through which organizational change occurs. This group works through the prescribed steps of sociotechnical systems analysis, develops recommendations for organizational change and then plays a major role in the implementation of the change. Several approaches were used to train this group in group processes and to teach them sociotechnical systems analysis. For instance, the group spent its first week together in the Leadership Management Development Course, which was taught by the CCAD Organizational Effectiveness Consultant. The purpose of this course was to teach group interaction skills, communication skills, and to illustrate how individuals become a group and behave as a group. This experience of going through this course is very intense, and develops very high levels of cohesion between members of the group. Such cohesion helps to motivate group members, and to develop high levels of productivity, cooperation, and commitment to the project. After the course, there was a re-entry period. During this period group members, while maintaining cohesion among themselves, also began to interact again with other members of the Depot. This stage proved to be awkward, and friendships and loyalties were strained. The design group was also receiving training from the consultants on sociotechnical systems analysis as it proceeded through the five structured stages of the technique.

There was also concern that information about STEP should be available to workers throughout the Depot. In one fashion or another STEP would probably touch the working lives of most people throughout the Depot. Therefore, it was important that these people understand the nature of the project and its objectives. Since the changes which would be made would affect the character of their work, their support was a requisite for project success.

Information was being disseminated throughout the Depot in several forms. The Depot newspaper carried stories on a fairly continuous basis about STEP. The "Philosophy Statement" and the results of the System Scan were made public. Most important, the STEP Design Group learned about the organization, its problems, changes needed, and its good points from the people "on the floor" of the Depot. Through exchanges between members of the Design Group and workers and managers, information about STEP and its progress was disseminated.

Evaluation. Support for STEP at CCAD has been very strong, as has the involvement of the Design Group, management, and anyone who has thus far been touched by the project. The attitude toward STEP has been consistently positive. There seems to be good complete understanding of the project, its procedures and techniques, its underlying philosophy, and its objectives. It is apparent that the approach undertaken to establish support and involvement has been highly successful. Development of support and participation is being accomplished in a controlled systematic fashion, and it is intended to have this approach continue for the duration of the project.

Most significantly, the Depot feels that STEP is its own work, its own project, and it looks forward to and welcomes positive change. These feelings of ownership are some of the most critical factors in the success of an organizational change technique such as STEP. Thus far, the consultants have done an excellent job not only in guiding and involving the Depot, but also in the continual process of placing the responsibility for STEP in the hands of the Depot. Proper groundwork has been laid at all levels. Based on the attitudes displayed towards STEP at this point, the possibility of future success appears encouraging.

#### Completion of the System Scan

Description. During the period of time covered by this formative evaluation, the first of five structured steps of sociotechnical systems analysis, the System Scan, was completed.

A preliminary scan was done by the consultants. The purpose of the preliminary scan was to determine which part of the Depot would be the best candidate for the sociotechnical analysis. Based upon their own observations and information obtained through meetings with key figures, the consultants concluded that the Airframes Division (AFD) would be best suited for the analysis. There was some confusion at the beginning of the project in that it was assumed that because the AFD had been chosen other parts of the Depot had been totally eliminated from the project. However, although the AFD was chosen as the target section, other parts of the Depot--if found to be functionally adjacent to, dependent on, or in some way integrally connected to the AFD--will not be omitted or precluded from the analysis. A more accurate and complete way to define the target area is the "UH-1H helicopter system," as well as anything directly related to that system.

The formal System Scan was conducted by the STEP Design Group. The purpose of the Scan was to determine: the system mission, output and input, boundaries (technical, territorial, time and people), critical environmental factors, economic and social objectives, and the "presenting" problems. The scan provided the opportunity to view the organization as a system, which is open to its environment, is purposive and "living." Viewing the organization in this manner is an alternative to viewing it as a rigid, lifeless structure, with rules, regulations and procedures (STEP Systems Scan, CCAD, 24 May 1982, p. 2).

The System Scan achieved its purpose by defining the target organization, its mission, input and output, boundaries, and environmental factors. It specified the objectives and stated presenting problems (see Appendix A). The list of presenting problems will be combined with the results of the Technical Analysis and Social Analysis to determine the type and nature of recommendations for change. The specifications set out in the Systems Scan will identify the boundaries of the project as a whole.

Evaluation. As noted above, the findings of the System Scan combined with those of the Social and Technical analyses, and the Philosophy Statement will define the nature of the intervention, the critical variables and the goals of the planned changes. The System Scan is the definition of what will be analyzed. The System Scan, as it was conducted, began the process of identification and definition of mission, problems, boundaries, and targets for change. In the allotted amount of time the STEP Design Group accomplished the first part of STEP successfully. Most important, the System Scan taught the members of the design group to look at the organization in a new way, as a system. This new perspective has implications for the future and success of the project and even for the future of the quality of individual working lives. It is expected that this point of view will help a member of an organization gain a better understanding of how an organization works, the purposefulness of an organization, its activities, and their interrelated nature. It will provide better insight into reasons for organizational dysfunction, and a better feeling for how an individual's job fits into the larger organizational mission. A feeling of fitting in or belonging helps to cut down on alienation and improve quality of working life. In addition, simply doing the System Scan, as well as the fact that there are new individuals (i.e., the consultants) at the Depot on a daily basis, indicates that change has already begun to occur and that something is already different. Thus far, reactions have been positive.

#### In-Process Review (IPR)

Description. The first of four IPRs was held 24 May 1982. Attending were: the STEP Design Group, CCAD Command and Staff, representatives of HQ DESCOM and ARI, and the consultants. The results of the System Scan were reviewed. Also, the Philosophy Statement (see Appendix B) was described. Reactions were very positive to both the System Scan results and the Philosophy Statement. However, questions were asked and revisions were suggested for the Philosophy Statement. It was pointed out that the Philosophy Statement is a living and evolutionary document. Its stated goals and objectives must be ones with which the Depot can live. It must be taken seriously as a document to live up to, and it will be an ever-changing document, depending on the direction of STEP, the nature of changes implemented and the feelings of Depot members. The goals and mission of the Philosophy Statement are implicitly the goals and missions of STEP. At a later point in time, it will be determined if these objectives are being met and how they have changed with the progress of the project, if at all.

Evaluation. The in-process review was very successful. Although there was much discussion, there was almost no disagreement about either the Scan or the Philosophy Statement. The manifest purpose of the review was to present what had been accomplished thus far in STEP. A secondary outcome was that workers and managers met together formally for the first time in this project. Before the meeting, it was apparent that certain members of the STEP Design Group were somewhat nervous and skeptical about the interaction. However, the interaction went smoothly and it was productive and positive. This positive interaction may set the stage for future productive relationships between management and workers and will have implications for the scope and nature of changes implemented by STEP.

## APPENDIX A

**Socio-technical Evaluation Program  
(STEP)  
SYSTEMS SCAN  
of the UH1H Overhaul System  
Corpus Christi Army Depot (CCAD)**

24 May, 1982  
(Revised 2 June 1982)

**INTRODUCTION:** The systems "scan" is the first of five structured parts in a socio-technical systems analysis. This scan provides the members of the "target" organization, through its design group, the opportunity to view their organization as a system. Once the systems perspective is developed and validated, the next four parts of the program can be undertaken. Those five parts are as follows:

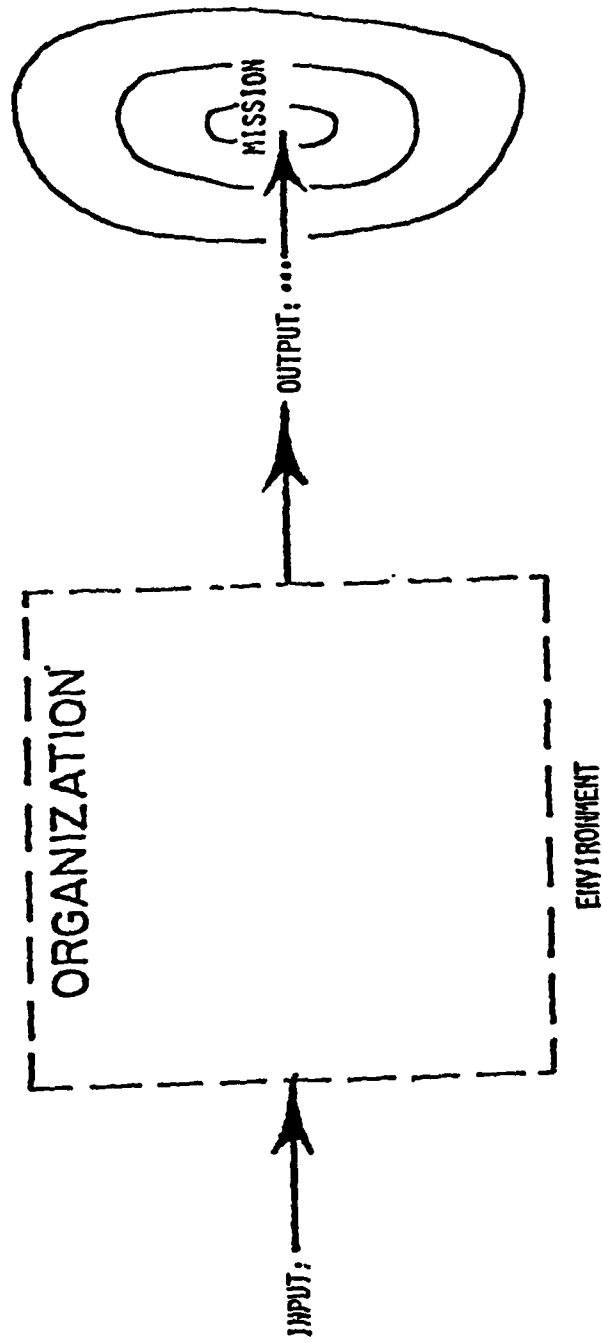
1. Systems Scan
2. Technical Analysis
3. Analysis of Key Variance Control
4. Social Analysis
5. Joint Optimization/Design Recommendations

We have completed the first step. This present document contains a report of it. The fifth step won't be finished until September, 1982.

Something About Systems. Knowing something about systems is helpful in understanding why certain things belong together, and why making a change in one part of a system always affects other parts as well. The system scan is an important part of the STEP process because it will help us see our organization as a system. We do not usually think of organizations as systems. A system in its most simple definition is "a bounded region which contains interrelated parts." This definition fits the use of system as in "stereo system," or "weapons system" or the "fire alarm systems in hotels and other large buildings."



FIGURE 1  
THE OPEN SYSTEM



We can also speak of "living systems" -- we, each of us, are living systems, as are all other living animals. Living systems differ from simple mechanical systems because they use energy just to exist, without doing any work at all.

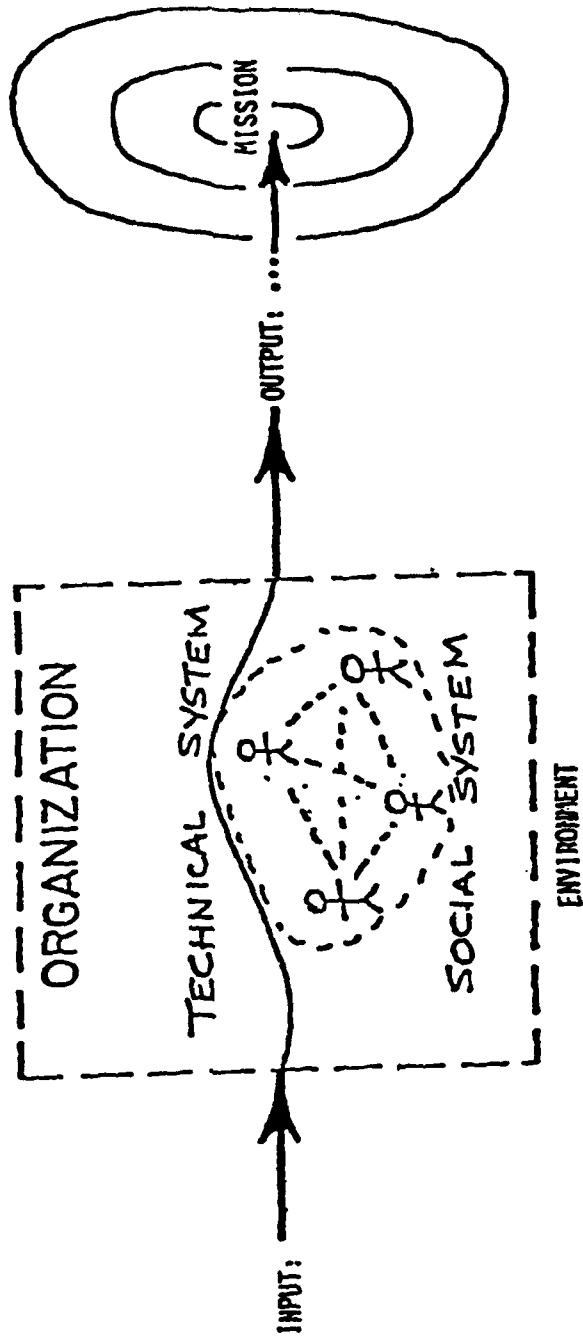
We can speak of "open systems" too. Open systems are "open" to their environments. Since every system has a boundary, it has an outside world or environment outside that boundary. If that environment affects and is affected by the system, we say that it is an open system.

Finally we can talk about "purposive systems," which have one intentional and specific purpose beyond survival.

Organizations as Systems. If we combine the notions of "living" system, "open" system, and "purposive" system, we can apply that combined concept to organizations. Any organization with a mission, with people, and in an environment which affects it, can be seen as an open, purposive, living system. The accompanying diagram (Figure 1) shows the various elements of such an organizational system. Since most organizations have people and have a mission, we'll simplify the name and refer to this merely as an "open system."

Open Socio-technical Systems. But we said earlier that all systems have interrelated parts. We will use a simple model of two interrelated parts -- a technical part (or technical sub-system), and a social part (or social sub-system). We'll call this an open socio-technical system. The technical sub-system contains all the methods, tools and techniques to convert the system's raw material (or "input") into its product (or "output"). The technical sub-system is shown in Figure 2 as a kind of pipeline from the input to the output. The social sub-system is made up of all the contacts between the people in the system. Some of those contacts (or relationships) are necessary to make the technical sub-system work. Some others are necessary for the system to adapt to a hostile environment, or develop into a stronger system. Finally, other contacts are used just for the system to exist or survive. Figure 2 shows some contacts as related to technical sub-system issues -- which is meant to show that the two

FIGURE 2  
THE OPEN SOCIO-TECHNICAL SYSTEM



parts (social and technical) are interrelated as they should be in a system.

As we said earlier, the scan is a part of the STEP process which helps us see an organization as a system -- as an open socio-technical system. Most of the time we see organizations (even the ones we belong to) not as systems with boundaries and environments, but as rigid lifeless structures of lines of authority between boxes on a wiring diagram, machines, rules, procedures, parking lots and factory gates. Often organizations seen this conventional way are described by the jobs that people do -- rather than the purpose or mission that the organizational "system" pursues. Beginning to see our organization as a system helps us begin to understand our organization in a new way -- a way that will help us recognize and strengthen what we are doing right in pursuing our aims and to try to improve what we are doing as well. That is the STEP process. Once we have completed this scan and checked it out with CCAD we will begin the next four steps which will take that new understanding to its completion.

We invite you to continue reading the following few pages, which describe the UH-1H process as an open socio-technical system.

The scan itself is comprised of eight separate questions that have been answered by the STEP Design Group. The questions are as follows:

1. What is the mission of the system?
2. What is the output from the system?
3. What is the input to the system?
4. What are the boundaries of the system?
  - Technical boundary (I/P and O/P transfer points)
  - Territorial boundary
  - Time boundary
  - People boundary (who is inside?)

5. What are the important environmental elements outside the boundaries?
6. What are the economic objectives of the system?
7. What are its social objectives?
8. What are its "presenting" problems?

These questions are answered in order on the next pages.

SCAN: UH-1H OVERHAUL/REPAIR SYSTEM

1. THE SYSTEM MISSION. What is meant by "mission" here is similar to "purpose." That is, what is the distinctive identity of this system -- what makes it special or different? What makes it ours and not just any similar type organization? What is its special skill or competence? Our mission statement must be short enough to remember easily; it must also be clear enough to recognize, and to permit us to pursue it easily. It must also not be attainable, but always just out of the reach - must guide and lead our system through our attainment of goals and objectives. The mission statement we have developed is,

"TO PROVIDE SERVICEABLE UH-1H HELICOPTERS  
IN ACCORDANCE WITH ARMY REQUIREMENTS."

The keywords are "serviceable," and "in accordance."

Serviceable means good enough quality so that safety and effectiveness of the aircraft are never compromised; and this will be done in accordance with conditions of urgency, security, complexity, or cost performance as required by the Army.

2. SYSTEM OUTPUT. The output or product of a system should be the key ingredient in pursuit of the mission. Each system should only have one identifiable product, although it can have different versions or types of the same product. The product here is,

"A SERVICEABLE UH-1H HELICOPTER ACCEPTED  
BY A CUSTOMER."

This product is clearly relevant to the mission as defined above, and as current Army regulations are met the system will be more effective.

3. SYSTEM INPUT. The input is the raw material which the system transforms or converts into the output. It is important to note that the input is not only the expendable tools or materials which are used up or consumed by the transformation process. Input is also not the labor or methods of conversion. The input identified by the STEP Design Group is,

"A REPAIRABLE UH-1H HELICOPTER ACCEPTED BY CCAD  
FOR OVERHAUL, NEW FASTENERS, MATERIAL, FLUIDS,  
SERVICEABLE ENGINES, AND COMPONENTS."

4. THE BOUNDARIES OF THE UH-1H SYSTEM. We are dealing with boundaries from several points of view rather than just one. These multiple boundaries are the "technical" boundaries, the "territorial" or physical boundaries, the "time" or temporal boundaries, and the "people" or social boundaries. Although all perspectives are important for the scan, the so-called "technical" boundaries are the most important because they define where our product enters and leaves our system. In other words, these points are where the aircraft first belongs to us, and where it ceases to be ours any longer.

The input boundary was defined as that point where the helicopter is received by Supply complete with paperwork and signed for (in Hangar 46).

The output boundary was defined as that point where,

- (a) a crew picks up a UH-1H helicopter from Supply and signs off on it as OK (in Hangar 46).
- (b) Transportation picks up a UH-1H helicopter from Supply and signs for it (in Hangar 46).

Physical boundaries were defined to include parts of Hangars 43, 44, 45, 46, & 47, Building 8 and the paint shop. Note that we are not including the remote sites of field repairs the TDY teams perform.

Time boundaries were defined as the length of time it takes to process a UH-1H helicopter from receipt into Supply through pick-up -- approximately 135 calendar days (30 days input storage, 90 days onhand, 15 days FLT test & output storage).

People boundaries were defined to include parts of the directorates of Supply, Maintenance (including production control, production planning and records), Quality Control, and Administration and Services (including equipment maintenance). Personnel in Quick Change Assembly, Harness Shop, Small Parts Repair, Tail Boom Build-up, Rubber, Glass, Cowling and part of the Rotor Wing Shops are included. People in these directorates span from director level to entry level. Note that among others, components and engine division personnel, and TDY airframe teams are not included.

5. ENVIRONMENTAL ELEMENTS. There are many diverse aspects to any system's environment. The UH-1H system is no exception. The following list includes the apparent side (e.g., Dept. of Army), and the not-so-apparent (e.g., SPCA), and everything in between. These elements have been listed without respect to the relative importance they may have to the system at any specific time. They are all important enough to list and to consider during the analysis, and to attend-to during the design.

<u>They are saying to the System</u>		<u>The System is saying to Them</u>
Give us information	<u>News Media</u>	Be fair and supportive
Comply	<u>Local (City/County) Regulations</u>	Be less resistant to change
Give us good helicopters	<u>Army</u>	We will support you
Abide by the contract	<u>Unions</u>	Provide good representation & we will work with you
Stay open and support us	<u>Navy</u>	Give us the services we are paying for
Take our people	<u>Texas' Employment Commission</u>	We will hire qualified people Help us meet EEO guidelines
Clean up your act	<u>OSHA INSPECTORS</u>	Don't shut us down
Provide good jobs	<u>Corpus Christi Community</u>	Support us
Meet our standards	<u>TSARCOM</u>	Support us
Control costs	<u>DESCOM</u>	Give us more people, money, workload
Maintain readiness	<u>DARCOM</u>	We will do our part
Gotcha!	<u>GAO Auditors</u>	We can justify it!
Understand our demands We will support you	<u>Other Shops &amp; Divisions at CCAD</u>	Meet your schedules and support us
Give us good training	<u>Army Reserve Units</u>	We will train you



They are saying to the System

The System is saying to them

Tell us your requirements and we will help you	<u>Civilian Personnel Office</u>	Improve turnaround time on personnel actions
We will help you when we can	<u>Contracted Services</u>	Meet your obligations
Give us your business Give us more lead time	<u>Vendors</u>	Reduce lead time - give it to us sooner
Follow our directives Do it our way	<u>EEO</u>	Don't overreact
Hire us but pay competitively	<u>Available Labor Force</u>	Check us out
Tell us what you want changed	<u>TSARCOM Engineers</u>	We need timely deviations
Don't mess with the pigeons	<u>SPCA</u>	Understand they cost us money
Don't overlook our interests	<u>Community Organizations</u>	We're involved
Use our services Follow our directions	<u>Metallurgical Oil Analysis Labs</u>	Keep up the good work
Use more	<u>Utilities</u>	Keep the rates down

Other external influences include

DOD Budget  
Weather - Corrosion, Fog, Hurricanes, Humidity  
Geographical location - near salt water, good weather

6. THE ECONOMIC OBJECTIVES OF THE UH-1H SYSTEM. This list below describes the product, and mission in terms of dollars, or in terms that can easily be converted into costs. The STEP Design Group identified the following list as the economic objectives CCAD is currently measuring.

- Stay within authorized costs
- Be competitive with the private sector
- Provide a quality product
- Operate with optimal use of available manhours
- Stay within scheduled turnaround time
- Minimize lost time due to accidents
- Reduce material handling damage

7. THE SOCIAL OBJECTIVES OF THE UH-1H SYSTEM. The social objectives can describe all aspects of a system's values about people. In some cases those values are stated in terms of current levels of achievement, sometimes social objectives are stated in terms of what a system would like to provide for people. The following list contains both -- and it represents only a beginning.

The Commander and his management staff have recently drafted a "philosophy statement" containing a list of management values. We understand that managers at the division level have, or are continuing to review it. We in the STEP Design Group are also reviewing that philosophy so that we can live by it during the life of our task force, and so we can discuss it with CCAD. We plan to use the final version of that philosophy as the "social objectives" of the UH-1H system, and to design organizational improvements with it in mind. This list below is only a beginning. Like the other aspects of the STEP process you will be hearing more about it.

SOCIAL OBJECTIVES

- Maintain a safe working environment
- Provide appropriate training for the workforce
- Provide proper recognition and rewards
- Maintain a motivated workforce
- Improve communication among the workforce
- Abide by government regulations

8. PRESENTING PROBLEMS. The term "presenting problems" refers to the issues or opportunities for improvement presented by the system in response to the STEP consultants' query "What problems

would you like to resolve?" These presenting problems do not imply a root cause or a solution. They are not listed in an attempt to place the system in a bad light, or make it look like a poor performer or poor place to work. Nor are these presenting problems raised in order to have a "target" for change using the socio-technical systems techniques. These issues are listed to identify an energy and appetite for improvement. They will not be ignored in the STEP process, but neither will they be addressed directly. Following the "joint optimization" activity (step 5), these presenting problems will be reviewed to determine which of them (if any) had not been addressed by the organizational redesigns proposed in step 5. In typical applications of socio-technical analysis we understand that most of the problems originally presented, are reduced or eliminated by the redesign without a formal "problem solving" or "fire fighting" focus.

The 80-plus presenting problems identified by the STEP Design Group can be clustered into eight categories:

<u>CATEGORIES</u>	<u>Number of Items</u>
1. Manpower & People	11
2. Methods & Procedures	12
3. Parts & Materials	14
4. Management & Supervision	10
5. Tools & Equipment	2
6. Physical Plant & Working Conditions	7
7. Coordination & Communication	18
8. Miscellaneous	14

APPENDIX B

CCAD PHILOSOPHY STATEMENT

JOINT EFFORT OF THE COMMANDER, THE STEP DESIGN GROUP, AND THE TOTAL DEPOT MANAGEMENT STAFF TO EMPHASIZE THE DEPTH OF THEIR COMMITMENT

WE FIRMLY BELIEVE THAT IMPROVEMENT OF PERFORMANCE AND QUALITY OF WORKING LIFE IN THIS DEPOT DEPENDS PRIMARILY ON THE ABILITY, DESIRE, AND COMMITMENT OF ITS PERSONNEL. WE ALSO BELIEVE THAT EMPLOYEE COMMITMENT WILL BE ACHIEVED BY MANAGING HONESTLY AND FAIRLY, IN A WAY THAT IS SENSITIVE TO THE NEEDS OF THE WORKFORCE.

IN APPLYING THIS PHILOSOPHY, WE WILL STRIVE TO:

1. Consider each employee a trusted and valuable member of the organization, responsible for contributing to the organizational goals.
2. Encourage each employee to provide input on issues and be involved in decisions concerning their working life.
3. Provide a working climate conducive to integrity, initiative, ingenuity, new ideas and constructive criticism, considering individual needs and employee dignity.
4. Encourage an open and meaningful two-way communication to improve our effectiveness in working with others.
5. Provide a clean, healthy, safe, and harmonious working environment.
6. Provide opportunities for development, training, growth on the job, and prospects for advancement to all employees in keeping with Depot requirements.
7. Provide opportunities and information to prevent dead-end careers.
8. Provide timely information directly to the employees who need to act on it.
9. Create an environment that encourages and supports effective leadership at all levels.
10. Provide awards, recognition, and counseling to employees based on knowledge, skills, and performance that contribute to Depot goals.
11. Assure that affirmative action is taken in accordance with merit promotion principles.

FORMATIVE EVALUATION II (JUNE 1982) OF THE  
SOCIOTECHNICAL EVALUATION PROGRAM (STEP) AT THE --  
CORPUS CHRISTI ARMY DEPOT

Nehama Babin  
US Army Research Institute

Scope of the Evaluation

This is the second of four formative evaluations of the Sociotechnical Systems Evaluation Program (STEP) which is being conducted at Corpus Christi Army Depot (CCAD). This evaluation will cover the entire month of June, up to and including the second In-Process Review (IPR) at CCAD.

During the month, the STEP Design Group completed both the Technical Analysis and the Analysis of Key Variance Control. At the end of the month an IPR was held at which the results of the two analyses were presented to Depot Command and Staff.

The STEP Design Group also began an intensive effort to disseminate information about STEP throughout the Depot. At the end of the month, discussion began concerning measurement of productivity and quality of working life. The selected measures will be used to gauge changes that are hypothesized to be consequences of STEP.

This evaluation will elaborate on these three topics: (1) the technical and key variance control analyses, (2) dissemination of STEP information, and (3) quality of working life and productivity measurement.

Technical and Key Variance Control Analyses

Background and description. The Technical Analysis and the Analysis of Key Variance Control are the second and third stages in the series of five structured steps in sociotechnical systems evaluation. The purpose of the technical analysis is to determine the combination of techniques, machines, tools, computers, software, raw materials, and procedures which are used to achieve the desired results within the identified organizational unit. The Technical Analysis begins with identification of unit operations. A "unit operation" is defined as an identifiable state during which a change is made on an input, such as a repairable UH-1H helicopter. The STEP design group identified five unit operations in the transformation of system input (i.e., repairable UH-1H) into system output (i.e., overhauled serviceable UH-1H). The five operations are: reception/induction, disassembly, processing, assembly, and issue. The aircraft (the UH-1H helicopter) progresses from one unit operation to the next in a linear fashion with the exception of two

points at which there are feedback loops. The points in the process at which the aircraft may be sent back through parts of the system are at "assembly" and "issue."

A second step of the Technical Analysis is the identification of key variances. Key variances are the technical requirements that have the most influence on quality, quantity, and costs of the UH-1H operations. The following key variances were identified: time to process, completeness of shop repairs, time to assemble, completeness of kitting, quality of finished assembly, parts availability, time to paint, component changes, time to certify and hazard/dependability of functional aircraft. (Details explaining the key variances can be found in Appendix A).

The third stage of sociotechnical systems evaluation is the Analysis of Key Variance Controls. This analysis explores the manner in which each key variance is controlled, the unit operation where it originates, where it is observed, and where it is controlled. The results of the Key Variance Control Analysis are summarized in Table 1 of Appendix A.

Both the Technical Analysis and Analysis of Key Variance Control are methods of observing the process of the transformation of raw material into a finished product. The focus is on the "object" which is being changed rather than on machines or tools, which is the focus of most studies of industrial organizations. The Technical Analysis helps members of an organization understand the work process in their organization and the business of their organization. The matrix which is developed based on the Technical Analysis (see Appendix A, p. A-8) actually describes how the technical system operates, and can be used as an organizational reference. The Analysis of Key Variance Control examines the linkages between the social system and technical system of the organization, identifying where and how the system controls technical requirements.

Both stages of analysis provide information which can help CCAD Command, the STEP Design Group, and the general population get a much clearer picture of both the process and product of their work. Classic research<sup>1</sup>, which explored the impact of technology on workers' lives, found that losing control over the process and product of their work had an alienating effect on workers. The Technical and Key Variance Control analyses can provide workers with new insight in regard to their work, work processes and the controls. Such insight can increase quality of working life and can help each member of the organization get a clearer picture of his/her role in the technical system.

At the In-Process Review (5 July 1982), the STEP Design Group presented to Depot Command and Staff both the Technical Analysis and the Key Variance Control Analysis. The IPR was attended by the CCAD Command and Staff, representatives of HQ DARCOM, HQ DESCOM, ARI, the consultant, and STEP Design

<sup>1</sup>For example, see Blauner, R. (1964). Alienation and Freedom. Chicago: University of Chicago Press.

Group. In general, there was agreement with the results of both analyses. However, one difficulty seemed to be over the use of terminology. For example, definitions of some critical terms, such as "overtime," were discussed, and it was found that different groups had different understandings of the term. It was suggested that a glossary might be added to the revised edition of the Technical Report. There was also concern that there are key variances which had not been identified by the analysis. It was explained that the ones chosen were only the "tip of the iceberg," and through an iterative process some would fall out and new ones would be identified. Other than some minor revisions, the report was accepted and the Design Group was given the signal to continue on to the Social Analysis, the fourth stage of STEP.

Evaluation. During a STEP training session, Dr. James Taylor, one of the two consultants, explained that in recent times organizations have become too complicated, and that members of organizations are neither able to determine the purpose of an organization, nor understand the technologies, structures or belief systems of their organizations. This has become especially true in an age of sophisticated, complex technology. The Technology and Key Variance Analyses help members of an organization understand the technical system of their organization. The analyses translate complex technical systems into terms which can be related to easily and simply throughout an organization. The IPR was an example of the difficulty members of an organization can have when communicating with each other about their own technical system. For instance, there was misunderstanding over terminology. However, the IPR served the purpose of clarifying for all involved the exact nature of the technical system, so that future communication will be much easier. In view of the complexities of the system, though, the amount of agreement among members of the Depot about the technical system was considerably high. The In-Process Review also pointed to the fact that STEP is on schedule and proceeding as planned.

Only one difficulty was perceived at this stage of the project. It was stated during the IPR that, as key variances were dealt with and controlled, other related variances would be fixed or solved automatically. However, the alternative might occur and other problems could arise as a key or central variance is fixed. It is not clear at this point how the negative repercussions can be controlled or at least made manageable. It is advised that when the implementation occurs, during Phase II (i.e., the second half of the project during which changes will be implemented) of STEP, that possible long-range effects of planned change be traced and documented, so that control measures can be taken if the effects are negative.

#### Dissemination of STEP Information at CCAD

Background and description. In an effort to win support for STEP and to initiate a dialogue about the project and its objectives throughout the Depot, the STEP Design Group is making an intensive effort to disseminate information about STEP throughout the organization. Although every effort was made to publicize STEP generally, and the System Scan and Philosophy Statement specifically, many people in the Depot had not received any information.

Consequently, the STEP Design Group has been scheduling meetings with a series of groups in order to inform them about the progress and findings of STEP thus far. The groups being addressed are: Quality Circle Leaders, STEP Design Group alternates, all STEP Design Group volunteers, and managers who had attended STEP seminars at the beginning of the project. In conjunction with this effort a weekly newsletter is published, and the Aircraftsman, the Depot newspaper, carries articles about STEP on a fairly regular basis. Moreover, employees are encouraged to contribute comments, reactions, and suggestions through telephone "Hot Lines." It is also planned that the Social Analysis questionnaire will be used as a vehicle through which members of the Depot will be informed about STEP. For instance, the questionnaire will include questions concerning employee attitude toward the Philosophy Statement.

Sociotechnical Systems Evaluation is a participatory process. It requires commitment and involvement, which means that it is necessary to have an informed workforce and management within the organization. It is critical that members of the organization feel that the program and ensuing organizational changes belong to them and that it has not been imposed upon them by management or a force external to the organization. Commitment and involvement is also necessary since the members of the organization will have to assume responsibility for the continuation of STEP after the consultants have left the Depot. They will need to be fully informed at all stages of the program in order to be able to carry on further iterations of STEP.

Evaluation. The effort to disseminate information has been a strong one. To date, there had been some difficulties. For example, there are still members of the Depot who are unfamiliar with STEP. However, the plan of action now being followed would have positive results. It is also advised that, if possible, reports be published in Spanish since a large proportion of the work force is of Spanish background.

Even with the effort to inform CCAD about STEP and to involve them in the project, there is concern about the continuation of the project, after the consultants have left. In a sense, the critical period for STEP will be the six months to one year after the end of the program (i.e., 1 January 83 - 31 December 83) since the organization will have to assume full responsibility for change and make adjustments as change occurs. Since STEP will be discontinued on 31 December 82 if there are no plans institutionalized to insure its continuation as a self-sustaining process, it is suggested that plans and discussions for the future of STEP at CCAD be initiated, and that the Design Group be included in these discussions.

#### Selection of Quality of Working Life and Productivity Measures

Background and description. Key variances were identified based on the impact they had on the quality, quantity and cost of processing a UH-1H helicopter. It is tentatively planned to have the STEP Design Group collect measures of quantity, quality, and cost during the implementation phase.



These measures will be organizational level; that is, they will be measures of the total UH-1H system, rather than measures of the output of each unit or work center within the UH-1H system.

In addition, measures are needed of productivity and quality of working life (QWL) at the work center level. It is planned that these measures will be collected for the period of the intervention and for a preceding period of time (approximately one year). The measures taken from the preceding period will provide an historical baseline so that comparisons can be made of productivity and QWL measurements before and after the implementation. Together, the organizational indicators and the work center measures can provide a complete statistical picture of the technical and social system of the Depot.

A meeting was held with CCAD Command and Staff, representatives of ARI, HQ DARCOM and HQ DESCOM, and the consultant to select appropriate measures. It is important that all parties concur on the selection of measures. The measures are a picture of the Depot, its work processes, products, and people, and therefore, it is necessary that everyone views the "picture" from the same perspective, and that any results which are publicized are not out of context and thereby misconstrued.

A draft list of productivity and quality of working life measures (to include economic, performance, and human indicators) was presented at the meeting. The list was based on interviews which had been conducted with managers who are directly involved with productivity measurement at the Depot. It was decided that fiscal year 1980-1981 data would be used as a baseline. It was also suggested that measures which are selected include a ratio of the actual performance versus the standard performance. Economic measures were deleted completely. It was felt that inflation rates are such as to make any kind of cost indicators meaningless in the aircraft industry.

It was uncertain whether or not data could be collected at the work center level or only the organizational level. Therefore, a committee was appointed to determine which data are available, and methods of collection. Based on the committee's findings final selection of measurements will be made.

Evaluation. The meeting on measurement of productivity and QWL went very well. The Command support was excellent and decisions were made thoughtfully, concisely and quickly. Measurement is a complex issue and, therefore, it was gratifying to be able to apply structure which would eliminate some of the ambiguity and difficulties of both the nature of the measures and the method of data collection.

Although it is tentatively planned for the STEP Design Group to collect information on measures related to the key variances, it is encouraged that a plan for an organized structured data collection effort be initiated. If the data is collected in a form which is reliable, valid and consistent, it will be useful for many types of analyses and can provide information for many purposes.

## APPENDIX A

Socio-technical Evaluation Program  
(STEP)  
TECHNICAL ANALYSIS, and  
ANALYSIS of KEY VARIANCE CONTROL  
of the UH-1H Overhaul and Distribution System  
Corpus Christi Army Depot (CCAD)

In Process Review (IPR) #2, 8 July, 1982

(Revised 19 July, 1982)

Introduction: The "Technical Analysis" and the "Analysis of Key Variance Control," are the second and third of five structured parts in the Socio-Technical Evaluation Program (STEP). The "Technical Analysis" provides members of the target organization (here the UH-1H overhaul and distribution system) a view of their technical process as a whole, and its requirements. The "Analysis of Key Variance Control" further permits those members to assess how (and how well) their organization presently controls and copes with its prime technical requirements.

These two phases of the STEP process form an important part of the program. Many organizations in the U.S., and throughout the world, suffer from the confusion and disarray caused by employees not being in communication; much less in agreement about the "business they are in," and the basic process for pursuing that "business." In the first, or "scan," phase of the STEP process the "business" of the UH-1H system was defined as providing servicable and acceptable UH-1H helicopters to customers in accordance with Army requirements. Thus, the technical process provides required overhaul of servicable UH-1Hs, and delivery to customer satisfaction.

As indicated above, one of the major problems with jobs and work in today's organizations is that the relationship between the overall technology and the worker has been allowed to become confused. The second phase of the STEP process, a systematic

analysis of the technical process, permits us to separate the UH-1H technology from the social organization in CCAD for greater understanding. This analysis phase also allows CCAD to identify the critical technical requirements or "key variances" in order to understand better (and to aim reorganization toward) optimal technical or production results. Following the technical analysis in other socio-technical systems applications, organizational members (management and workers) usually find themselves really understanding their business (or the purpose of their organization) and communicating about it for the first time.

The third phase (the Analysis of Key Variance Control), which is also described in the present report, focuses upon one part of the social system and examines the ways in which, and degree to which control is achieved for the technical requirements identified, as described above. In other applications of the socio-technical process supervision, verification, and inspection are frequently found to be the mechanism of control. Not infrequently in these other organizations certain requirements or variances are found not to be controlled as well as they might be because they require that persons in the organization be better coordinated and communicate more effectively.

In this report, the STEP design group's findings from these second and third phases of the STEP process are described for the UH-1H system. If the reader has not reviewed the results of the first phase, the "systems scan" for the UH-1H system, he or she is encouraged to read, as background to the present report, STEP IPR#1 dated 2 June, 1982.

#### THE TECHNICAL ANALYSIS

Unit Operations: Identification of unit operations is the first step in the technical analysis. Once the boundaries have been defined (and the primary mission or task of the system has been established by identifying the output or product that is expected and that in turn has helped to define the input) then it is possible to identify the unit operations in the technical process. Unit operation is a concept borrowed from chemical engineering, which refers to any one of the phases of a technical process in which an identifiable state change in the input occurs. Given this definition, it follows that any technology can be analysed by identifying all of its mutually exclusive unit operations. Furthermore, this analysis will

have the advantage of defining that technology in terms of its input rather than by its processes or techniques. This focus ensures that the technical system will be analyzed separately from the jobs and work of people on the one hand and from the supervisory and control system on the other. In locating these unit operations, design teams frequently find that they can establish fewer unit operations for their system than they at first thought. This is because many of the operations performed on the input are control, checking, verification or inspection activities rather than fundamental changes in that input.

Figure 1 shows the technical process flow for the repairable UH-1H aircraft within CCAD. Note that the flow is broken into five "unit operations" or state changes in the transformation of system input into system output. The basic technical input to the CCAD system is a repairable UH-1H helicopter received for overhaul. Technical inputs to the UH-1H system as defined in the "scan" also include servicable engines, transmissions, and components such as instruments and radios, as well as new materials, such as metals, fasteners, paint, and fluids. The basic output from this particular system is an overhauled, servicable and acceptable UH-1H transferred or delivered to a user or customer.

The five steps into which the technical process is divided are as follows. The first "unit operation," shown in Figure 1, "Received/inducted," involves the received repairable UH-1H into CCAD. This includes induction by Maintenance Directorate personnel, as well as receipt by Supply Directorate. The second unit operation shown in Figure 1, "Disassembled," results in a disassembled UH-1H. This second step includes the repair evaluation of airframe, engine and components, and their routing to appropriate locations for repair or storage; as well as actual disassembly. The third unit operation, "Processed," includes the necessary repair (in particular to the airframe) to Army requirements. The fourth unit operation, "Assembled," includes not only assembly, but painting and flight test (to confirm that the finished assembly does fly as intended). The fifth unit operation identified for the UH-1H system is "Issued," which is not completed until the customer taking possession has the opportunity to fly the aircraft. Under normal circumstances the aircraft (airframe) progresses in a linear flow through these five state change or "unit

operations." Figure 1 however includes two reverse loops in the flow, which represent disassembly and repair or replacement of parts or components identified; after assembly (e.g., at flight test), or before aircraft can be issued to customer following Safety of Flight Messages.

Key Variances: Identification of key variances is the second part of technical analysis. Once unit operations have been determined for the system, there follows the important task of identifying the many technical requirements or variances, and from among those of selecting the most important, or 'key', variances. Those key variances are so called because they are the technical requirements that have the most influence directly on quality, quantity, or costs of UH-1H processing; or they are the variances that, although having indirect effects themselves, are 'key' to causing those effects that do impact directly on the system's primary task.

Variances are defined, not necessarily as problems to be faced (which should have been identified as the 'presenting problems' in the scanning step), but merely as deviations around some central tendency or from some norm. These deviations represent technical system requirements to be controlled, and the primary purpose of the variance analysis is to examine the manner in which those variances, or requirements for control, are met.

The actual process of identifying key variances involves first the listing of all known variances for each of the unit operations. These variances represent the possible deviations from a standard that are brought about either by the state of the input to that unit operation or by the normal process of the technical procedures or techniques. Variations brought about by breakdowns in the technical process or by human error are not included in this listing. Following the listing of all variances for each unit operation, the key variances are identified as those which are most direct or important in their impact on quantity, quality or costs.

The final step in further identifying key variances involves the construction of a matrix that includes all the variances, grouped within their unit operations, along both axes. Cell entries in the matrix are the relationships between each pair of variances throughout the

work system. Informal rules of selection are applied, which define a variance as 'key' variance if it impacts on (a) one or more of the key variances identified in the preceding step, or (b) several other variances in subsequent unit operations.

Figure 2, The Matrix of Variances, shows both the five unit operations or state changes in the flow of the UH-1H; together with some 80-plus "variances," for the unit operations. Figure 2 also shows, in the body of the matrix itself, the interrelationships among the variances identified by the STEP design group. "Key Variances" are shown in Figure 2 by the circled numbers of variances, on the diagonal of the matrix. In all ten variances were identified by the design group as being the most critical either in their direct effect on quality, quantity, and cost of the UH-1H; or by their important indirect effects on other variances which impact these outcomes.

Criteria: UH-1H output criteria for quality, quantity and cost were defined by the STEP design group as follows.

Typical output quality for the UH-1H produced by CCAD was determined to be the average number of "valid" customer complaints at delivery, plus the average incidence of complaints upon return to the user's base. These averages were currently determined to be three valid complaints at delivery and one valid complaint after initial trials at the user's base. The STEP design group evaluated each variance on the matrix to determine which of them, if uncontrolled, would increase customer complaints, as defined, by at least one.

Typical output quantity of UH-1Hs was defined as the average number of aircraft issued to customers per month. This number, since January, 1982, averaged 19.5. The design group evaluated each of the 80 variances in terms of their uncontrolled impact on the number of UH-1H issued per month. An impact of 10% (2 aircraft) was considered "significant."

Output cost criteria were determined to be based on limiting time above standard (excess hours for unforeseen repairs and hours of rework), and costs of waste and scrapped material not calculated in the fixed price, per individual

UH-1H. The current average excess hours per aircraft were determined to be somewhat above standard. Typical cost in excess scrap and waste materials was determined by the design group to be about 10% of total costs per aircraft. The design group assessed each variance on the matrix to identify which would impact excess unbudgeted costs by 10%.

The ten "key" variances identified by the design group were those which impacted directly on at least two, and in some cases three, of the output criteria (quality, quantity, and cost) described above. In addition most of the ten variances identified as "key" also have widespread impact on other variances as shown by the interrelationships among variances in the matrix (Figure 2). The specific reasons for classifying the variances as key are described in the following list.

KEY VARIANCES:

- o Variance #35, "Time to Process (manhours & elapsed time)," affects both output quantity and output costs.
- o Variance #39, "Completeness of Shop Repairs," affects quantity and costs; and in addition impacts several other variances.
- o Variance #49, "Time (manhours & elapsed time) to Assemble," affects quantity and cost and impacts on other variances.
- o Variance #50, "Completeness of Kitting," affects quantity and cost.
- o Variance #55, "Quality of Finished Assembly," affects quality, quantity, and costs, as well as impacting on several other variances.
- o Variance #56, "Parts (Repair parts, sub assy, and components) Availability (from supply/purchasing, maintenance, internal mfg.)," affects quantity and costs.
- o Variance #57, "Time (manhours & elapsed time) to Paint," affects quantity and costs.
- o Variance #63, "Component Changes from flight test & late configuration changes," affects quantity and costs.
- o Variance #67, "Time (manhours & elapsed time) to Certify," affects quality, quantity, and costs.
- o Variance #85, "Hazard/dependability of Functional Aircraft," affects quantity and costs.

Summary: Key variances in the UH-1H system cluster themselves into four groupings, two of which are closely related and related to the others. The clusters of timeliness (Vars #35, 49, 57, 67), and availability of parts and components (Vars #39, 50, 56) are highly related to one another. Further, these two clusters are related to the quality of



assembly (Var #55). The fourth category of variance in the present analysis--hazards identified by Safety of Flight Messages--is also a factor in timeliness and parts availability for work in process. Figure 3 shows these groups of key variances and their relationship to quantity and cost criteria.

#### VARIANCE CONTROL ANALYSIS

This third phase of the STEP process actually forms a connection between the technical analysis just described, and the social analysis to be undertaken. In the analysis of key variance control, the ten key variances are examined one at a time to determine the manner in which they are currently controlled in CCAD. This is accomplished by listing the unit operation in which a key variance originates, the unit operation where it is observed, and the unit operation where it is controlled (or controlled-for, coped-with, or absorbed). In it are also listed who or what control the key variance, what actions are used to control it, and the source of information for control.

This control analysis is described in the following pages. Table 1 provides a summary of the analysis.

#### CONTROL OF KEY VARIANCES:

##### Key Variance #35 - "Time (manhours & elapsed time) To Process Structures Repairs"

Controlled by the Structures Mechanics in unit operation III who

- (a) process to spec and on time, assigned by PSA
- (b) call in PSA to authorize extra time if needed
- (c) defer work on items that have not been identified by PSA but need repair.  
(These usually get picked up later in the process).
- (d) ask their supervisor to arrange for an engineering deviation when there is conflict with specs., or contact with QC Supervisor where there is conflict with QC interpretation of TM specs vs. the OCM concept.

Key Variance #39 - "Completeness of Shop Repair"

Controlled by the Prime Shop Mechanics in unit operation III who

- (a) process and repair parts to spec (some shop travellers show out-of-date specs), and within time schedules defined by PSA within the OCM concept.
- (b) initiate requests for TEC (to create new specs) when scope of repair is unclear
- (c) rework parts rejected or damaged in assembly

Also controlled by Production Control in U/O III who

- (a) schedule and expedite parts
- (b) juggle part sequences if necessary in order to meet schedules

Control is also impacted by the Assembly Mechanics in U/O IV who

- (a) reject parts received, for rework -- opinion vs. servicability.
- (b) frequently contact the prime shop mechanics directly to expedite parts, bypassing production control to save time
- (c) remove parts from the prime shops without authorization and/or paperwork required

Key Variance #49 - "Time (manhours and elapsed time) to Assemble"

Controlled by the Assembly Mechanics in U/O IV who

- (a) evaluate, assemble and test aircraft systems, frequently relying on informal shop floor practices and specs rather than official documentation and directions ("its ok so long as GC buys it")
- (b) acquire parts missing from assembly kits by personal actions, (rob back, unauthorized removal of parts from other kits, ASTORS, prime shops) rather than taking time to go thru channels
- (c) are concerned primarily with adhering to scheduled process time thru the assembly shop (18 days per aircraft) rather than the actual scheduled completion date of the aircraft

Control is also impacted by the Assembly Supervisor in U/O IV who assigns and

coordinates work to the mechanics, and by Production Control in U/O IV who orders kits from Astors for each station as required

Key Variance #50 - "Completeness of Kitting"

Should be controlled by Prime Shop PC, and ASTORS, in U/O III, but is not in the present system

Mechanic begins control by tagging & documenting parts in U/O II.

Primarily controlled is by the Assembly Mechanics in U/O IV who

- (a) rely on unauthorized removal of parts from other stations or departments as required
- (b) notify production control of the need to track down and expedite shortages
- (c) notify their supervisor if they cannot find parts. Production Control and the supervisor then initiate a 557 authorizing rob backs or resequencing of parts

Key Variance #55 - "Quality of Finished Assembly"

Controlled by the Assembly Mechanics in U/O IV who

- (a) frequently disregard the Shop Travellers, and TM's, relying instead on informal shop standards and work practices (shirt pocket manuals)
- (b) work directly with (for) individual QC inspectors whose personal interpretation of standards are often inconsistent and variable. Emphasis on selling aircraft to QC encourages overprocessing from maintenance viewpoint ("Gold Plating")

Key Variance #56 - "Availability of Parts (repair parts, sub assys & components)"

Controlled primarily by Production Control in U/O III who

- (a) order parts and schedule workload (sometimes not done)
- (b) initiate action on shortage lists (but sometimes do not follow-up)
- (c) is responsible for monitoring and maintaining shop inventories (not always done)
- (d) resequence parts to compensate for schedule slippages (important)

Control is also impacted by unauthorized removal of parts from the prime shops and ASTORS by assembly and flight test mechanics who do not initiate paperwork to trigger the reordering process and conversely by raising the reorder ratio (DOF)

Key Variance #57 - "Time to Paint"

- o Controlled by Painters in U/O IV who
  - (a) tape, wash, sand, alodine prime paint, and stencil aircraft to specs
  - (b) touch up processed aircraft as required
- o Control is impacted by the unevenness of the work flow (too little early in the month, too much later in the month) which causes congestion and transportation problems in the paint area, and by configuration changes made after painting is completed.
- o Control is further influenced by Admin. Services' internal maintenance of paint booths and equipment.

Key Variance #63 - "Component Changes"

- Controlled by Crew Chiefs in Flight Test (U/O IV) who
- (a) note deficiencies during test and replace components as required
  - (b) acquire replacement components by fair means or foul ("night riders") from the rest of the system on a maximum priority basis. The system is not always notified of unauthorized removal of parts and as a result parts are not reordered to cover for resulting shortages
  - (c) Crew Chief's experience strongly influences test pilot's acceptance or rejection of aircraft (and components) during certification testing.
- Control is also impacted by the rigour of final QC inspection which is performed to flight test standards (more exacting than prime shop and assembly QC interpretations) "this is the first time we really go by the book"

Key Variance #67 - "Time to Certify"

Controlled by QC in Flight Test (pilots and inspectors) in U/O IV who

- (a) strongly influence the number of flight tests required per aircraft
- (b) perform other duties (deliver aircraft to customer, take training etc) which delay test
- (c) pilots do not like to fly each others aircraft, and inspectors do not like to buy each others aircraft

Control also influenced by spending extra hours to cope with end-of-month rush, and number of aircraft in test

Key Variance #85 - "Hazard/Dependability of Functional Aircraft"

Controlled by

- (a) QC who distributes safety of flight message (SOF)
- (b) supervisor who identifies affected parts
- (c) mechanic who inspects parts and takes appropriate action to comply with SOF
- (d) QC who certifies compliance with SOF.

FIGURE 1  
UNIT OPERATIONS FOR THE CCAD UH-1H SYSTEM

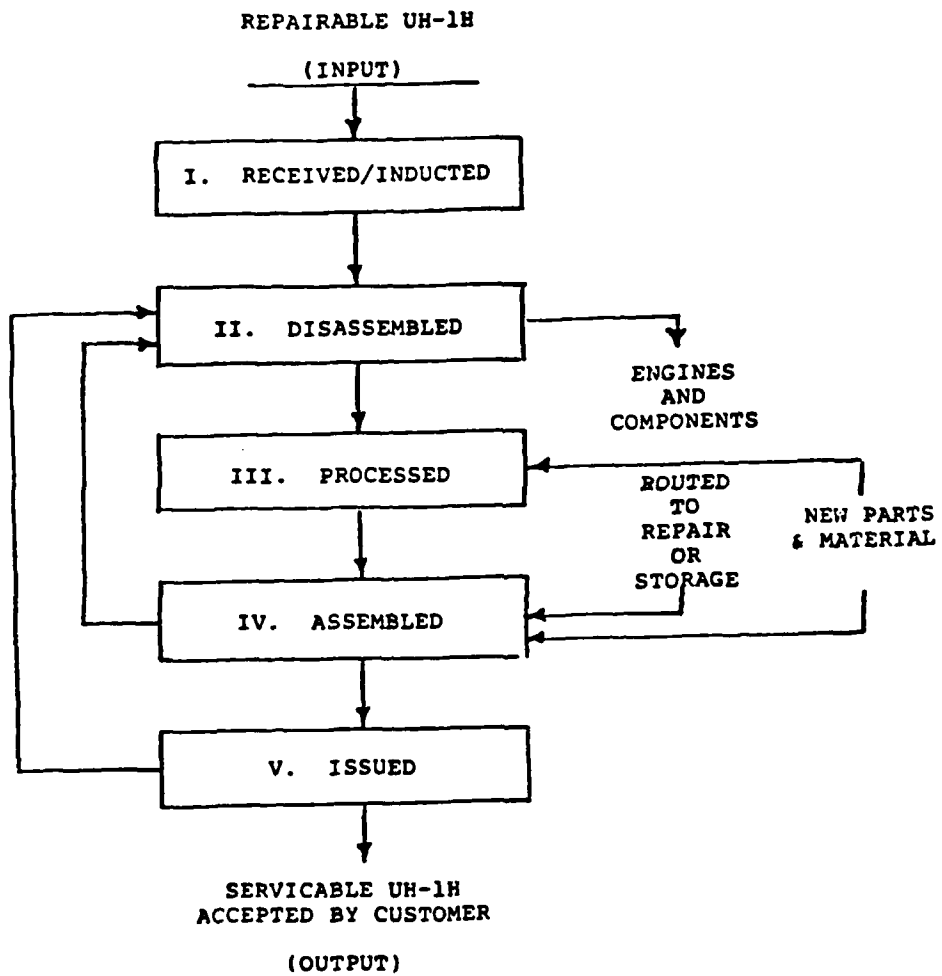
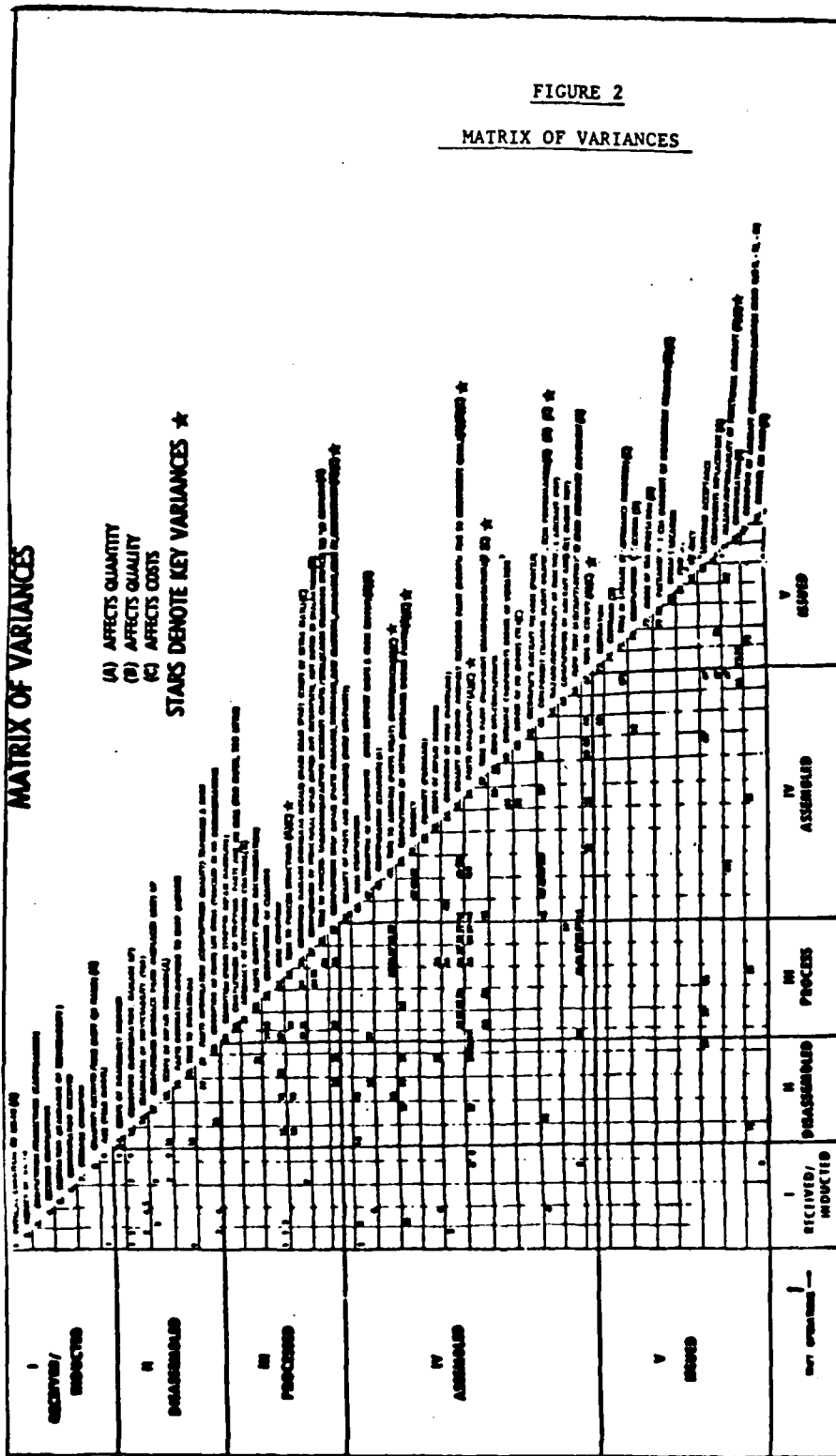


FIGURE 2

MATRIX OF VARIANCES



**FIGURE 3**  
**KEY VARIANCE CLUSTERS**

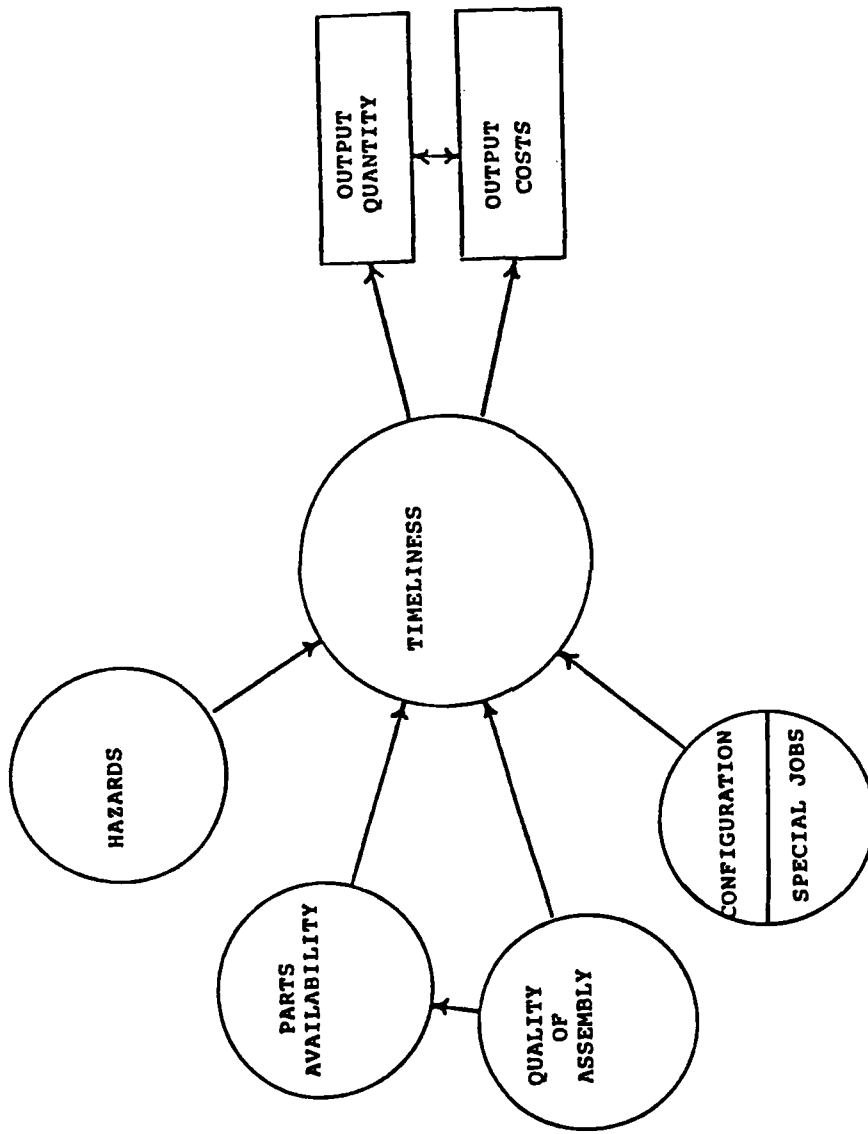




TABLE I. CCAD UH-1H System, Page 1

VARIANCE CONTROL TABLE

KEY VARIANCES	NAME OF UNIT OPERATION			BY WHOM? (ROLE)	ACTIVITIES REQUIRED TO CONTROL	INFORMATION & SOURCES OF INFORMATION RELATED TO CONTROL ACTS.
	WHERE OCCURS	WHERE OBSERVED	WHERE CONTROLLED			
(035) Time to Process	Processed (III)	Processed (III)	Processed (III)	Structures Mechanic + PSA + Supervisor	-Completes to spec -Skip Work -PSA Authorizes more hours -Sup requests Engineering Deviations	-DMMR, Workbook, TED's, Blueprints -Visual Inspection -Input from QC
(039) Completeness of Shop Repair	Processed (III)	Processed (III)	Processed (III) Assembled (IV)	"Prime Shop" Mechanic & Production Expediter & Production Controller & Assembly Mechanic	-Completes to spec. -Reworks Rejected Parts -Juggles Sequences. -Initiates Request to create new spec. -Removes parts from Prime Shop	-DMMR, Shop Travellers, TM's, TED's, Blueprints, Input from Assembly Mechanics -TED's -Input from P.C.
(049) Time to Assemble	Assembled (IV)	Assembled (IV)	Assembled (IV) Processed (III)	Assembly Mechanic + QC	-Builds and Sells to individual QC interpretation of stds. -Steals Parts as needed to meet Assy Schedule	-Input from QC, other mechanics, Safety of Flight, Work Package, TM's -TD's -Shop Floor Manual -Shop Travellers

TABLE 1. CCAD UH-1H System, Page 2

VARIANCE CONTROL TABLE

KEY VARIANCES	NAME OF UNIT OPERATION			BY WHOM? (ROLE)	ACTIVITIES REQUIRED TO CONTROL	INFORMATION & SOURCES OF INFORMATION RELATED TO CONTROL ACTS.
	WHERE OCCURS	WHERE OBSERVED	WHERE CONTROLLED			
(150) Completeness of Kitting	Processed (III)	Processed (III)	Processed (III)	Production Controller (Expediter)	Inducts/Sequences/Orders, repair parts & orders moved to Astors	-Workbook -Shop Traveller -Blueprints -Historical Records -Tech Manuals -Visual Inspection of Kits
	Assembled (IV)	Assembled (IV)	Assembled (IV)	Assembly Mechanic	Steal, Rob-back as Required	
(155) Quality of Finished	Processed (III)	Processed (III)	Processed (III)	Assembly Mechanic +	-Work Directly w/ QC (individual interpretation of specs.)	-Feedback from QC. -Supervisor, PSA -DMWR -TD's -TED's -MWO's
	Assembled (IV)	Assembled (IV)	Assembled (IV)	QC Inspector	"Goldplating"	-Historical Records -Work Package -Shop Travellers -Blueprints
(156) Parts Availability	Processed (III)	Processed (III)	Disassembled (II)	Production Controller	Tags and orders movement of Parts	-Work Packages, -Schedules, -Locator Sheets, -Move Sheets, -Parts Analysis Rpt -TM's 557's
	Assembled (IV)	Assembled (IV)	Processed (III)	Production Controller	Schedules Shop, Orders Parts, Monitors & Maintains Shop Inventories	-Feedback from Mechanics/other PC's, Supervisor
	Assembled (IV)	Assembled (IV)	Assembled (IV)	Mechanics & Production Controller	Resequences Parts to Maintain schedule Rob-back as required	

TABLE 1, CCAD UH-1H System, Page 3

VARIANCE CONTROL TABLE

KEY VARIANCES	NAME OF UNIT OPERATION			BY WHOM? (ROLE)	ACTIVITIES REQUIRED TO CONTROL	INFORMATION & SOURCES OF INFORMATION RELATED TO CONTROL ACTS.
	WHERE OCCURS	WHERE OBSERVED	WHERE CONTROLLED			
(#57) Time to Paint	Processed (III) Assembled (IV)	Assembled (IV)	Assembled (IV)	Painters	Completes to Spec. and Schedule	-Work Package -Blueprints -Process Specs. -PC Work Orders -TB -Feedback from PSA, PC, QC & Customers
(#63) Component Changes	Assembled (IV)	Assembled (IV)	Assembled (IV)	Crew Chief & Assembly Mechanic	-Notes deficiencies in pre and flight test. -Replaces parts on aircraft -Acquires parts from process shops, assy, other aircraft	-Log Book -Discrepancy Reports -Historical Records -PSA Records -S.O.P. -TM, TB, PI, 557, -CCAD Regulations -Army Regulations -Info from Pilot, PSA, QC, PC -Info from other mechanics
(#67) Time to Certify	Assembled (IV)	Assembled (IV)	Assembled (IV)	Prime Shop Expeditor		
				Pilots	-Flies and Certifies aircraft -Assists delivery in resolving conflicts with Customers. -Ferries aircraft to Customer on demand.	Info from Crew Chief, QC, PC

TABLE 1. CCAD UH-1H System, Page 4

VARIANCE CONTROL TABLE

KEY VARIANCES	NAME OF UNIT OPERATION			BY WHOM? (ROLE)	ACTIVITIES REQUIRED TO CONTROL	INFORMATION & SOURCES OF INFORMATION RELATED TO CONTROL ACTS.
	WHERE OCCURS	WHERE OBSERVED	WHERE CONTROLLED			
(185) Hazards/ Dependability of functional Aircraft	Issued (V)	Issued (V)	Assembled (IV)	QC Inspector	-Distributes SOF to PC & Mechan- ic -Certifies repair for flight test	Safety of Flight Message (SOF)
				Mechanic	-Completes repair/ modification to spec -Robs-back parts as required -Routes & re- sequences parts as required	-Internal Priori- ty set by supply -Specs in SOF
				Production Controller		
			Issued (V)	Supply Personnel	-Determines In- ternal Priority for Aircraft in storage	SOF urgency
				QC Inspector	-Certifies SOF repair com- pliance for flight & issue	Visual Inspection

FORMATIVE EVALUATION III (JULY 1982) OF THE —  
SOCIOTECHNICAL EVALUATION PROGRAM (STEP) AT THE  
CORPUS CHRISTI ARMY DEPOT

Nehama Babin  
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Scope of the Evaluation

This is the third of four formative evaluations of Phase I of the Sociotechnical Systems Evaluation Program (STEP) which is being conducted at Corpus Christi Army Depot (CCAD). This evaluation covers the entire month of July, up to and including the Social Analysis report and the third in-process review (IPR) at CCAD.

During July, the STEP Design Group completed the Social Analysis and continued the process of dissemination of information about STEP. At the end of the month an IPR was held, during which the results of the analyses were presented to Depot Command and Staff.

This formative evaluation will describe the Social Analysis, the IPR, and the continuation of dissemination of STEP information. It will also provide an evaluation of the process and progress of these activities.

The Social Analysis and In-Process Review

Description. The Social Analysis is the fourth of five structured steps in sociotechnical systems evaluation. The purpose of the Social Analysis is to determine "who talks to whom about what." It examines the work-related interactions among people in an organization. First, the analysis identifies the key roles of the organization's social system, which are critical to the achievement of organizational mission, and then accounts for all functional relationships around the key roles. The functions with which the analysis is most concerned are:

- (1) Goal Attainment - Coping with disturbances and problems (key variances) in the technical process.
- (2) Adaptation - Short-term solutions to environmental disturbances.
- (3) Integration - Short-term solutions to internal system disturbances, e.g., coordination and conflict.

- (4) Long-term Development - "Latent system potential" which includes training, evaluation, compensation, and related activities.

The Social Analysis at CCAD was conducted during the month of July. The information for the Analysis was taken from interviews which were conducted with a random sample of 420 employees of the Air Frame's Division at CCAD. The interview which was constructed by the STEP Design Group was a structured open-ended instrument (See Appendix A). The topics covered by the interview were paperwork, training, adaptation to the environment, relations within work groups, relations with other work groups, supervision, individual job characteristics, and morale.

Based on data from the interviews, a diagram was constructed which illustrates key working relationships and lines of communication of the Huey Overhaul system. Furthermore, the diagram is a picture of functions, both strong and weak. In the diagram (see p. 4, Appendix B) balls are used to indicate roles and functions. The closer the balls, the more frequent the contacts. Both official and unofficial relationships are portrayed.

The Social Analysis also supplies a "social system grid" which combines the four required social functions (goal attainment, adaptation, integration, and long-term development), the relationships displayed in the role network diagram, and the four types of relationships found in organizations. The four kinds of relationships are:

- (1) Vertical relationships: between superior and subordinate
- (2) Horizontal relationships: between the focal role and same status members of his/her work group
- (3) Cross-group relationships: between the focal role and people in adjacent groups within the same socio-technical system
- (4) Relationships between outsiders and the focal role in the sociotechnical system under investigation.

The information for the grid was obtained through the same interviews used to develop the role network. The "Conclusion" (Appendix B, p. 15) provides a summary of the findings of the Social Analyses.

The results of the Social Analysis were presented at an in-process review at CCAD, 2 August 1982. The IPR was attended by CCAD Command and staff, the STEP Design Group, the consultants, the Deputy Director of HQ DESCOM, and representatives of DESCOM, DARCOM, and ARI.

Evaluation. The Social Analysis is one of the more complicated steps in sociotechnical systems analysis. The Analysis requires a large amount of information which must be synthesized in a readily usable and easily comprehensible form. The roles and functions which are identified are

critical in the control of key variances. Therefore, the social analysis can tell us where and how variances might be reduced or corrected, or brought under control.

One of the major findings of the analysis was the fact that unofficial, informal lines of contact and communication are the major vehicles for accomplishing work. It was suggested that if these lines were cut out, the work would probably not be accomplished. This finding attests to the importance of informal relationships in formal organizations.<sup>1</sup>

The determination of the "boundary line" (see Appendix B, p. 4) was questioned at the IPR. Those within the boundary line have the highest frequency of contact and the closest contact. The diagram indicates that the only official connection between those within the boundary and those outside is between the Production Controllers and Expeditors and the Planning Branch within the Air Frames Division. The results of the analysis proved this to be a weak link. The data made it apparent that this official line was being bypassed on a continual basis. Consequently, all other roles were attempting to compensate for the tenuous official relationships, and lack of official channels of communication. Unfortunately, boundaries between groups create an atmosphere of non-cooperation. Each group attends to its own problems first, leaving others to fend for themselves.

The Social Analysis also revealed that, although high levels of teamwork were reported among coworkers, in actuality there was not much evidence of teamwork activities to control key variances of quality of work, parts/material availability, and required repair. During the discussion of this point, it was mentioned that there is no reason for employees to work together and cooperate either within the work center or outside the work center. Employees need to be provided with the motivation to cooperate and work towards control of the key variances.

Many of the perceived difficulties described in the Social Analysis appeared to have their roots in the first-line supervisor. The first-line supervisors at CCAD are overloaded with responsibilities and duties. They are given many priority tasks, simultaneously all of which must be completed in a timely fashion. They must be responsive to both their employees and management which can result in role strain. However, the IPR audience was reminded that a social analysis is an identification of functions, not good or bad personalities and roles, and that problems which reside at the first-line supervisory level are results of larger system difficulties. Work redesign and organization restructuring may alleviate problems which are actually social system problems, but appear to be supervisor problems.

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<sup>1</sup>Blau, Peter. 1965. The Dynamics of Bureaucracy. Chicago: University of Chicago.

During the IPR there were questions concerning the connection between the Philosophy Statement and the Social Analysis. The specific link is to the Internal Integration function (the I cell of the GAIL scheme). Generally, the Philosophy Statement is an overarching principle from which the social system of the organization flows. In fact, terms of the Philosophy Statement were iterated in the interview responses to questions about quality of working life, job characteristics, and morale, thereby validating the relevance of the Philosophy Statement, and the degree to which it accurately mirrors the Depot Social System.

Overall, the response to the Social Analyses was positive. However, the tone of the discussion indicated that based on what the Analysis had found, the Depot was anxious to move ahead on recommendations for change. Much of the discussion kept wandering away from the Analysis, and into the area of potential changes to solve social system problems. It became clear from the tone of the IPR that the Depot climate was ready and anxious for implementation of organizational change.

There was also some indication of concern that the analyses which had been taking place during the past months were critical in tone and cast the Depot in a somewhat negative light. The IPR audience was reminded that CCAD has never dropped a project, that all its missions had always been completed. In fact, STEP was given to CCAD because it is already considered to be a good organization. STEP is a management and organizational development tool which theoretically should only be used in thriving well-working organizations. It can then be used to help improve such organizations.

#### Dissemination of Information on STEP

Description. The dissemination of information about STEP has been throughout the Depot. The Social Analysis acted as one of the best vehicles for distributing information about STEP. Four hundred twenty employees of the Air Frames Division (about one half of the division) were, interviewed by members of the STEP Design Group, thus placing employees in direct contact with the project. Also the interviews provided employees with the opportunity to provide their own input to the project. In fact, although a sample had been chosen for the interviews, all employees of the Air Frames Division were invited to be interviewed if they so desired.

The STEP Design Group has continued to brief managers on the progress and process of STEP. Furthermore, they have invited each of the managers to its meetings for the final stage of the STEP analyses. The group hopes that each manager will have direct input at this stage during which recommendation for organizational change based on data from analyses in previous stages will be developed.

At this point in time the Unions were also briefed on STEP. The Unions had been briefed at one other time, and based on that briefing, a Union representative had been placed on the Design Group.



Articles on STEP continue to appear in the "Aircraftsman," the Depot newspaper. Also the STEP Design Group publishes a newsletter on a regular basis.

It is also planned that any research on organizational change which is conducted by the Army Research Institute will provide feedback to the Depot on the results of that research.

Evaluation. The Social Analysis interviews confirmed the fact that there are still members of the Air Frames Division who are not familiar with STEP. Therefore, the continued effort to disperse information is not only useful, but necessary.

Furthermore, it was discovered that there is still a fair degree of skepticism as to the value of STEP. A common comment is that STEP is just "another gimmick in a long line of gimmicks" which does nothing for the Depot but create more work to do. Intensive effort to inform the workforce about the progress of STEP can help to dispel some of the skepticism and doubts.

Placing a Union representative on the Design Group has helped immensely to improve relations with the Unions and to keep the Unions informed about STEP.

Some reluctance to release information about the results of the Social Analysis was expressed at the IPR. However, the general feeling was that the data belongs to the workforce and, therefore, should be provided to it. In fact, if feelings of ownership and participation are to be encouraged at the Depot during the course of STEP, it is necessary to provide continual feedback and news about the project to all employees.

## APPENDIX A

### Structured Interview Guide Used in the Social System Analysis

STAY ON SCHEDULE - DON'T KEEP PEOPLE WAITING

#### INTERVIEW

##### RAPPORT

Comfort level between interviewer and respondent  
Interviewer introduction (who am I re STEP?)  
Appreciation for respondent's participation  
Voluntary (he can withdraw even now without harm)  
Confidentiality (no names - not interested)  
Random Selection (luck of the draw - 50% of UH-1H system)  
Time - 45 minutes maximum  
Questions from respondent before starting?

##### PURPOSE

STEP Program to improve organizational effectiveness and QWL  
This interview gives data for Social Analysis of UH-1H system  
To map who talks to whom about what  
To receive input from people  
To recheck data already received  
To get data on same subjects from all people at same time

##### METHOD OF INTERVIEW

- A. Read questions to you
- B. Kind of responses hoped for:
  1. Opinion and information
  2. More than yes or no answers
  3. Positive and negative side
  4. All questions should be examined from point of view of own work center
  5. Time allocation

##### CLOSING

Thank respondent again - You will be hearing about the results soon.  
Return to work area.

Directorate:	Maintenance	___	PSA	___	Mechanic	___
	Supply	___	PC	___	Inspector	___
	Qual Assur	___	Structures	___	Expeditor	___
	Other	___	Assembly	___	Supervisor	___
					Other	___

JOB

1. What is the best thing about your job?
  
2. What do you think is the most important function of your job?
  
3. What major difficulties do you encounter in the performance of your job?
  
4. What impact do parts shortages have on your production?
  
5. What is the main cause of this shortage? (P: kitting, components change, completeness of shop repair, time, quality, morale, cost)
  
6. What do you do to deal with parts shortages, and with whom? (P: forecasting, P.C., ASTORS, Supply, vendors, support shops, managers)

Directorate:	Maintenance	___	PSA	___	Mechanic	___
	Supply	___	PC	___	Inspector	___
	Qual Assur	___	Structures	___	Expeditor	___
	Other	___	Assembly	___	Supervisor	___
					Other	___

ADAPTATION TO ENVIRONMENT

With whom do you discuss the following:

7. Special programs (e.g., El Salvador)?
  
8. Shortages due to vendor problems (e.g., Honeycomb Panels)?
  
9. Criteria changes (from TSARCOM Engineering)?
  
10. Specific customer complaints?

Directorate:	Maintenance	___	PSA	___	Mechanic	___
	Supply	___	PC	___	Inspector	___
	Qual Assur	___	Structures	___	Expeditor	___
	Other	___	Assembly	___	Supervisor	___
					Other	___

RELATIONS WITHIN YOUR WORK CENTER

11. How much training do you get from others in your work center?
  
12. How well does your center work as a team? (P: morale, cooperation, rob-backs)
  
13. How much is your work center affected by use of leave by its members?  
(If affected, what leave use in particular?)
  
14. How much does your group question (discuss) QC write-ups? (P: gold-plating, challenge it, criteria)

Directorate: Maintenance	_____	PSA	_____	Mechanic	_____
Supply	_____	PC	_____	Inspector	_____
Qual Assur	_____	Structures	_____	Expeditor	_____
Other	_____	Assembly	_____	Supervisor	_____
				Other	_____

YOUR IMMEDIATE SUPERVISOR

15. How much does your supervisor keep you and work center informed?
  
16. How much does your supervisor respect his people's ideas and opinions?
  
17. How well does your supervisor do in leading this group? (P: trained, available, natural)
  
18. How technically knowledgeable is your supervisor? (P: this area, necessary, provides training)
  
19. How fair and equitable is your supervisor? (P: performance appraisal, IDY, 190H, promotion, buddy system)
  
20. How concerned do you think your supervisor is about his work center for itself as compared with the depot as a whole? (P: empire building, loyalty to subordinates, looking at big or small picture)

Directorate:	Maintenance	___	PSA	___	Mechanic	___
	Supply	___	PC	___	Inspector	___
	Qual Assur	___	Structures	___	Expeditor	___
	Other	___	Assembly	___	Supervisor	___
					Other	___

RELATIONS WITH OTHER GROUPS :

21. What other group does your work center have the most cooperation with?

22. How frequent is contact?

23. What other group does your work center have the least cooperation with?

24. How frequent is contact?

25. What is the most important issue between:

a. QC inspectors and mechanics? (P: goldplating)

b. PC expeditors and mechanics?

c. QC inspectors and PSA?

Directorate:	Maintenance	_____	PSA	_____	Mechanic	_____
	Supply	_____	PC	_____	Inspector	_____
	Qual Assur	_____	Structures	_____	Expeditor	_____
	Other	_____	Assembly	_____	Supervisor	_____
					Other	_____

MORALE

26. What affects high morale? (P: leadership, recognition, support from others, laxness, dead-end jobs, evaluations, promotions, tools, equipment, working environment) — low morale?

27. How is morale in your work center?



Directorate: Maintenance	___	PSA	___	Mechanic	___
Supply	___	PC	___	Inspector	___
Qual Assur	___	Structures	___	Expeditor	___
Other	___	Assembly	___	Supervisor	___
				Other	___

TRAINING

28. What kind of training do you get that is beneficial? (P: work related, cross training, rotation, personal learning)

29. Who trains you?

30. What is lacking? (P: type, quality)

Directorate: Maintenance	_____	PSA	_____	Mechanic	_____
Supply	_____	PC	_____	Inspector	_____
Qual Assur	_____	Structures	_____	Expeditor	_____
Other	_____	Assembly	_____	Supervisor	_____
				Other	_____

PAPERWORK

31. Which paperwork do you think is necessary to help you with your job, or with depot? (P: travelers vs MR's, DMWR, TM, 190H, etc.)

32. Which paperwork do you think is unnecessary? (P: 190H)

WHAT ELSE IS IMPORTANT TO YOU THAT WE HAVE NOT ASKED?

-THANK YOU FOR YOUR HELP WITH THIS PROJECT-

## APPENDIX B

### Socio-technical Evaluation Program

(STEP)

#### SOCIAL ANALYSIS of the UH-1H Overhaul and Distribution System Corpus Christi Army Depot (CCAD)

In Process Review (IPR) #3

2 August, 1982

(Revised 3 Aug 82)

The purpose of the social part of a socio-technical system is to provide the control, coordination, adaptability and flexibility that enable a particular technical system to achieve its goals. Part of this is through social control of key variances, and part is through performing other activities related to adaptability and flexibility. Together, these form the essential Social System functions.

#### THE ESSENTIAL SOCIAL SYSTEMS FUNCTIONS

Any social system if it is to survive, is required to perform four basic functions. These are:

GOAL ATTAINMENT (G)

ADAPTATION (A)

INTEGRATION (I)

LONG-TERM DEVELOPMENT (L)

Every organization exists in order to meet the short-term goal of producing its product (G). However, in doing so it must not adversely impact its capacity to survive as an organization. To do so it must adapt to, and be protected from short-term changes and pressures in its immediate environment (A). It must also combine or integrate activities to manage internal conflict and to promote smooth interactions among people (I). Finally, it must ensure the long-term development of knowledge, skills, and motivation to cope with goal-related, environmental and systems requirements in the future (L).

Many organizations have departments to perform these functions. For example, industrial engineering, planning, personnel, and training departments can have the main responsibilities for one or another of the four basic functions. Yet, we know from experience that not all such activities are handled by special departments. Indeed, informal activities are often more frequent and more influential in affecting functional behavior than formal methods.

Assemblages (such as crowds) differ from systems (such as organizations) because systems have structure.

Organizations typically contain collections of positions and jobs to which sets of behaviors have been assigned. These assigned behaviors are not completely specified in advance. Individual people occupying a position have expectations about it. Positions also involve legitimate expectations by others which are seldom formally defined.

SOCIAL ROLE -- This is a useful bridging concept between people and positions.

A role is a set of expectations and specified behaviors assigned to a position being occupied by someone having relationships with other people in other roles.

By its structure, an organization assigns activities to positions, and then assigns positions to specific individuals and/or groups.

Individuals holding these positions create roles by exercising their individual needs and wants in the positions.

- Positions without people are not roles.
- People without positions are not role-occupants.

People communicate their expectations to other people about the positions they hold in an organization -- these are role senders. Role senders transmit their own interpretations plus their own expectations.

Role occupants hear partly what their role set (i.e., all role senders) interpret and send, and partly what the occupant interprets and expects.

So role behavior is a combination of:

- Influential role senders
- The expectations of the role occupant
- The situation the role occupant finds him/herself in (involves physical, social, and psychological constraints).

In other words, individuals have a tendency to act as wholes, and not just simply in terms of their formal assignments. Obviously, there is seldom a perfect fit between individual role expectations and organizational expectations. Some form of accommodation is required between them. So, efforts must be made to clarify and satisfy mutual expectations. Otherwise, dysfunctional behavior will result (often characterized by low productivity, apathy, absenteeism, etc.).

### FOCAL ROLES

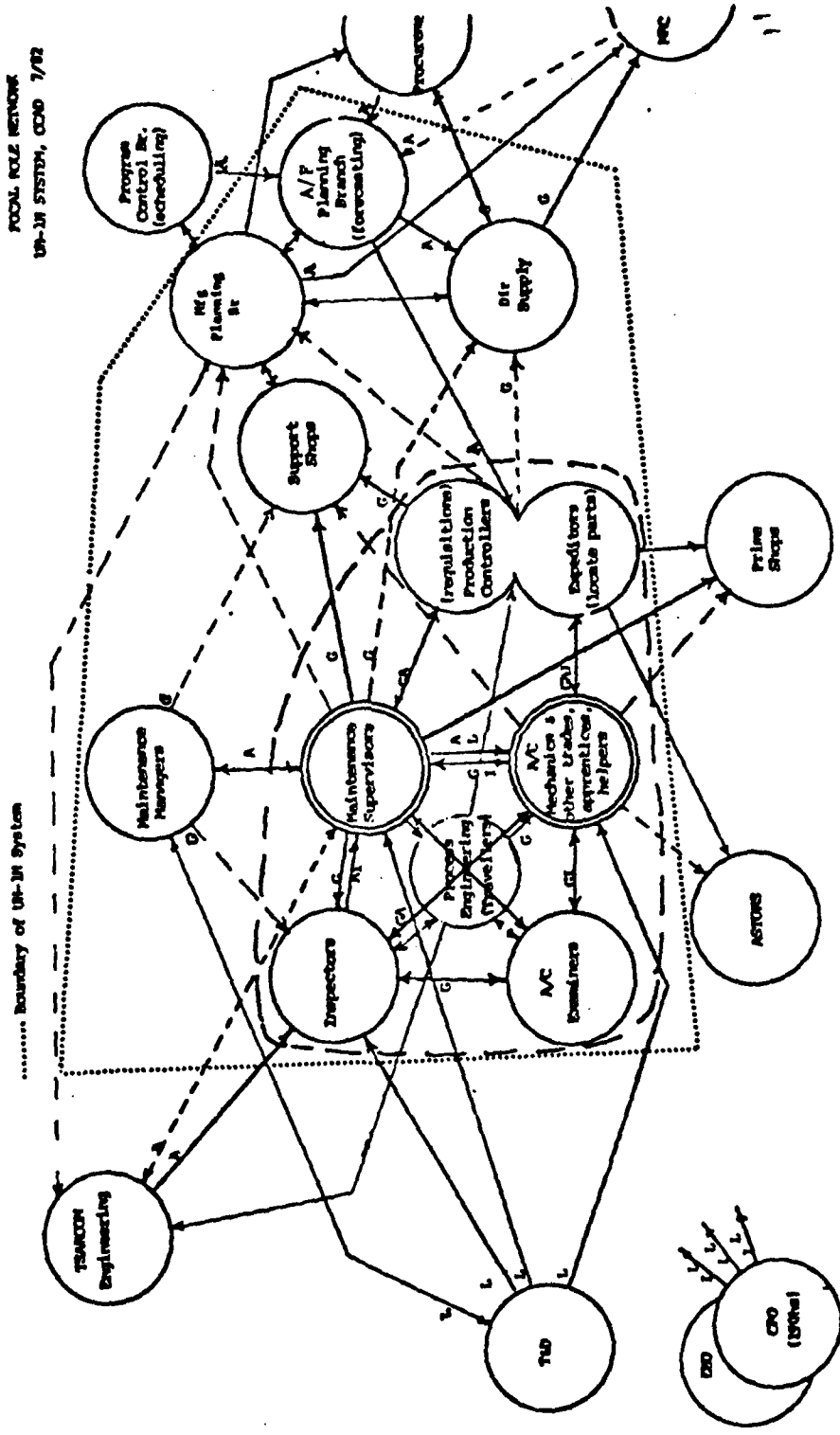
The social analysis attempts to examine accommodation between roles. Unless unlimited time and money exist to undertake an examination of every organizational role in the social analysis, it is necessary to identify a focal role (or a limited number of such roles) to adequately examine the mutual expectations described above. In a socio-technical analysis the most important roles are those most closely involved in the control of key variances. These roles should be taken as the key, or focal roles. An examination of the Table of Variance Control, especially the columns labeled "Controlled by whom?" and "Activities Required to Control" should permit the identification of the key, or focal roles in the system. Once the focal (key) role(s) have been identified then a network of Role Senders with the Focal Role can be constructed based on the frequency and direction of communication among them. Figure 1. presents a Role Network for the focal roles of A/C Mechanic (including other airframe trades, apprentices and helpers), and their immediate supervisors. The mechanics (and other tradesmen) in airframes, together with their immediate supervisors, are the major roles responsible for accomplishing the overhaul of serviceable and satisfactory UH-1H aircraft. Production controllers, Inspectors, and A/C Examiners act in a support or augmenting role to mechanics, their helpers and their supervisors.

### EXPLANATION OF FIGURE 1

Figure 1, The Role Network, shows the Focal Roles of Mechanic and Supervisor in relation to shop-floor production controllers, A/C examiners, and quality inspectors; together with supply personnel, ASTORS and shops personnel, PPC employees, TSARCOM engineers, T&D, EEO and CPO. Figure 1 demonstrates the function (G,A,I,L) that each role relationship affects. For instance, the mechanics have much contact with production controllers, but that contact is mainly about matters of obtaining parts in a timely manner (G). Their relation with their supervisors are requests for many things (including obtaining parts, G). These contacts result in help from the supervisors in obtaining technical engineering changes (TEC) from TSARCOM engineers (A), they include information about special projects (A), supportive comments about mechanics' opinions and ideas (I), and occasionally training (L).

Mechanics will contact inspectors themselves sometimes about "write-ups" (G), or TECs (A), and inspectors will tell them about customer complaints (A). Mechanics and their supervisors will contact shops for parts (G). Mechanics may talk with PSA examiners about repairs required, or be directed by them to route parts after disassembly to various points (G). Mechanics receive their apprentice training through Training and Development (L). They are required by the Civilian Personnel Office to prepare knowledge and skill appraisals (also known as "KSAs" or 190Hs) themselves in order to be considered for promotion (L). Mechanics and some other depot employees report being upset (I) by this KSA documentation which they feel rewards writing ability rather than their on-the-job performance.

Figure 1  
 LOCAL ROLE NETWORK  
 UN-38 SYSTEM, CNO 7/82



The task for any social system analysis is to map the structures and relationships in which the REQUIRED social system functions get carried out, and to look at interactive relationships within and between the various sub-systems involved. This mapping involves examining the purposes served by existing relationships, and examining the presence or absence of a fixed set of functional relationships in a social systems grid (Figures 2 and 3).

#### EXPLANATION OF FIGURES 2 & 3

The social systems grid takes the combined focus of the four required social functions (G, A, I, L), and the particular relationships of the role network, and adds to it four specific relationships found in most organizations. The resulting grid of 16 cells draws attention to every possible case of relationships fulfilling social functions which affect or are affected by the focal role and role senders. The four specific relationships the grid examines are as follows:

- 1) Vertical Relationships between superior and subordinate
- 2) Horizontal Relationships between the focal role and similar status members of his/her work group
- 3) Cross-Group Relationships between the focal role and people in adjacent groups within the same socio-technical system
- 4) Relationships between Outsiders and the focal role in the socio-technical system under investigation

In the Grid presented in Figures 2 and 3, the use of the A/C mechanic and maintenance supervisor is continued as the focal roles. In completing the grid, we have described behaviors or their absence in each of the 16 cells. For "Goal Attainment" some of the behaviors can be drawn directly from the "Table of Variance Control" for all the key variances identified in the technical systems analysis.\* Other behaviors dealing with key variance control (G), and behaviors for the other three rows (A,I,L) have been compiled from interviews with some 400 CCAD employees who are either occupants of the two focal roles, or who are the major role senders as described above.

As already noted, the Social Grid also permits identification of behaviors that are not occurring. For example, behaviors which are not reported to occur in the CCAD system, but which could be, are noted in cells A-2, and L-3. Other such behaviors will be found throughout the grid.

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\* That analysis, including the Table of Variance Control, for the UH-1H overhaul and distribution system in CCAD is described in STEP IPR #2, dated 19 July, 1982.

## INTERPRETING THE GRID

The social Systems grid is shown in the following pages in successive detail. Figure 2 is the single following page. Figure 2 is an evaluative summary of information obtained through interviews and classified by the four essential social functions. More complete results from the interviews will be found in Figure 3 (contained in several pages); which lists the data by roles interviewed whos answers are most "typical" (numerically most frequent), and the content of their answers. Behaviors evaluated in Figure 2, and described in Figure 3, are presented even more completely in Table 1 (Appendix) where the percentages of interview respondents replying in the most typical or frequent ways are listed. For those readers interested only in basic system evaluation, Figure 2 should be sufficient. Figure 3 actually describes typical behaviors and gives meaning to the evaluation. Table 1 provides numerical support for the summary information in Figures 2 and 3 for the reader who wishes more detail. The interview form itself is also included in the appendix.

The grid can summarize the social systems analysis in the following ways:

- Think about the entry in each cell of the grid. Will the continuation of the existing behaviors frustrate or irritate the focal person or others in the role network?
- Will the continuation of the existing behaviors improve or deteriorate organizational performance?
- Will the introduction of behaviors not presently occurring improve organizational performance, or the feelings of the people involved?
- If the grid remains unchanged will organizational effectiveness deteriorate, stay the same, or improve?



FIGURE 2

EVALUATIVE SUMMARY OF SOCIAL ANALYSIS DATA  
BY SOCIAL GRID CATEGORIES

	RELATIONS WITH SUPERIORS -1-	RELATIONS WITH COWORKERS -2-	RELATIONS WITH OTHER GROUPS IN UH-1H SYS -3-	RELATIONS OUTSIDE THE UH-1H SYSTEM -4-
-G- GOAL ATTAINMENT	Parts Avail. = 0/- Quality = 0	0/- +	- -	0/- Little Reported
-A- ADAPTATION TO ENVIRON.	0	Little Reported	0	0
-I- INTERNAL INTEGRATION	Staff = + Supervisors = 0 Wage Grade = -	Staff = + Wage Grade = -	+/-	-
-L- LONG TERM DEVELOPMENT	+/0	+/0	Little Reported	0/-

FIGURE 3 SOCIAL SYSTEMS GUID' (Page 3)

<p>RELATIONS SOCIAL FUNCTIONS</p>	<p>RELATIONS WITH SUPERVISORS -1-</p>	<p>RELATIONS WITH CO-OWNERS (in work center) -2-</p>	<p>RELATIONS WITH OTHER GROUPS IN UN-IN SYSTEM -3-</p>	<p>RELATIONS OUTSIDE THE UN-IN SYSTEM -4-</p>
<p>GOAL ATTAINMENT Key variances: (Parts availability) (?); "Lots of activity but apparently treating only the symptoms.")</p>	<p>-Supervisors approve parts-chasing manufacturing, or obtain the parts themselves. Do supervisors help more with parts than with hardware? -Supervisors do not report support from management.  <u>Overall neutral to negative.</u></p>	<p>-PC workers report that they help one another. This is positive. -Mechanics rob back from one another. None report that they work together to obtain parts.  <u>Overall neutral to negative.</u></p>	<p>-Mechanics and supervisors work with PC to obtain parts, but are frustrated by PC's ineffectiveness. -Supervisors contact Supply to obtain parts. -PC contacts Support shops and Supply for parts. -Some mechanics, supervisors, and PC agree that the information given to Expeditors from mechanics is incomplete.  <u>Overall negative.</u></p>	<p>-Maintenance supervisors contact prime shops. -PC may avoid prime shops because of their reportedly poor cooperation. -Mechanics obtain parts from prime shops -Planning Branch and Supply contact MHC and Procurement for parts.  <u>Overall neutral to negative.</u></p>

RELATIONS SOCIAL FUNCTIONS GOAL ATTAINMENT (continued)	RELATIONS WITH SUPERVISORS -1-	RELATIONS WITH COLLEAGUES (in work center) -2-	RELATIONS WITH OTHER GROUPS IN UM-UM SYSTEM -3-	RELATIONS OUTSIDE THE UM-UM SYSTEM -4-
<p>Key variances: (Quality of Overhaul/Assembly)</p>	<p>-Some supervisors report challenging QC write-ups for their work center. -Fewer mechanics report their supervisors challenge QC. <u>Metric</u></p>	<p>-Many inspectors discuss QC write-ups among themselves. -Mechanics report some discussion of write-ups among themselves. <u>Overall positive, but not strong</u></p>	<p>-Some mechanics challenge QC inspectors directly. -Some mechanics are resigned to doing what ever the inspectors ask. -Some mechanics accept all QC write ups as valid. -Some supervisors and mechanics comment that inspectors are inconsistent and tend to overprocess. -Some supervisors feel that the issue involves the inexperience of inspectors. -Most inspectors say that the major issue between themselves and the mechanics is interpretation of standards. -Some inspectors say that the quality of mechanics work is the major issue.</p>	<p>Overall, there is little understanding and considerable negative feeling between mechanics and inspectors. Neither mechanics nor inspectors agree on standards, either between groups or among themselves. Mechanics may have inconsistent standards for Assembly and Flight test.</p>

FIGURE 3 SOCIAL SYSTEMS GRID (Page 2)

FIGURE 3 SOCIAL SYSTEMS GRID (PART 3)

RELATIONS SOCIAL FUNCTIONS "C" GOAL ATTAINMENT (continues)	RELATIONS WITH SUPERVISORS -1-	RELATIONS WITH COLLEAGUES (in work center) -2-	RELATIONS WITH OTHER GROUPS IN THE SYSTEM -3-	RELATIONS OUTSIDE THE UNIT-SYSTEM -4-
(Depth of Repair, #10)			<ul style="list-style-type: none"> <li>-Depth of repair is well controlled by close cooperation between mechanics and PSA drillers.</li> <li>-Electricians report less cooperation with PSA.</li> <li>-Supervisors identify the issues between examiners and inspectors as either "power conflicts" or "cost vs. quality standards" disagreements.</li> <li>-Inspectors report that the issues between their group and the examiners are "interpretation of specifications" and/or "completeness of PSA analyses".</li> </ul>	
(Parts Information, #21)			<ul style="list-style-type: none"> <li>-Mechanics and supervisors report that some Shop Travellers are out of date. The Travellers are provided by Process Engineering.</li> </ul>	

FIGURE 3 SOCIAL SYSTEMS GRID' (Page 4)

RELATIONS SOCIAL FUNCTIONS ADAPTATION TO ENVIRONMENT	RELATIONS WITH SUPERVISORS -1-	RELATIONS WITH COORDINERS (in work center) -2-	RELATIONS WITH OTHER GROUPS IN OR- IN SYSTEM -3-	RELATIONS OUTSIDE THE OR-IN SYSTEM -4-
(Special programs)	<ul style="list-style-type: none"> <li>-Appears to be a lot of topdown advice</li> <li>-Supervisors and mechanics discuss special programs together</li> <li>-Maintenance supervisors discuss special programs with their bosses</li> </ul>	<ul style="list-style-type: none"> <li>-Not much communication with coordiners reported</li> </ul>	<ul style="list-style-type: none"> <li>-PPC contacts Supply and Production Control to discuss special programs</li> </ul>	<ul style="list-style-type: none"> <li>-PPC discusses special programs with PIC units</li> </ul>
(Vendor shortages)	<ul style="list-style-type: none"> <li>-Supervisors and mechanics discuss vendor shortages with eachother</li> </ul>		<ul style="list-style-type: none"> <li>-Supervisors and mechanics discuss vendor shortages with PC</li> </ul>	<ul style="list-style-type: none"> <li>-PPC discusses vendor shortages with Procurement</li> </ul>
(Criteria changes)	<ul style="list-style-type: none"> <li>-Supervisors and mechanics discuss criteria changes with eachother</li> <li>-Electricians do not discuss criteria changes with supervisors</li> </ul>		<ul style="list-style-type: none"> <li>-Inspectors discuss criteria changes with maintenance supervisors</li> </ul>	<ul style="list-style-type: none"> <li>-Maintenance supervisors and inspectors discuss criteria changes with ISARCOM engineers</li> </ul>
(Issues involving customer complaints)	<ul style="list-style-type: none"> <li>-Mechanics and inspectors discuss customer complaints with their supervisors</li> <li>-Some Maintenance supervisors discuss these complaints with their bosses</li> </ul>	<ul style="list-style-type: none"> <li>-Inspectors discuss customer complaints with their coordiners</li> </ul>	<ul style="list-style-type: none"> <li>-Inspectors discuss customer complaints with Maintenance supervisors and with mechanics</li> </ul>	<ul style="list-style-type: none"> <li>-No contacts were reported</li> </ul>

FIGURE 3 SOCIAL SYSTEMS GRID' (Page 5)

RELATIONS WITH SUPERVISORS -1-	RELATIONS WITH CONCORDERS (In work context) -2-	RELATIONS WITH OTHER GROUPS IN UP-1H SYSTEM -3-	RELATIONS OUTSIDE THE UP-1H SYSTEM -4-
<p style="text-align: center;">RELATIONS WITH SUPERVISORS -1-</p> <p>-Staff personnel in the sample thought very highly of the treatment received from their supervisors.</p> <p>-Maintenance supervisors felt their superiors were moderately supportive.</p> <p>-Wage grade employees rated their immediate supervisors low in supportive activity.</p> <p>-Most people in the sample felt that their immediate supervisor respected their opinions and ideas. May indicate that most workers were treated like adults, rather than children, by their supervisors.</p>	<p style="text-align: center;">RELATIONS WITH CONCORDERS (In work context) -2-</p> <p style="text-align: center;">(Teamwork)</p> <p>-Staff personnel in the sample were highly positive about their group's teamwork.</p> <p>-Maintenance supervisors were moderately positive about teamwork within their group.</p> <p>-Wage grade employees viewed teamwork within their group neutrally or as poor.</p> <p style="text-align: center;">(Impact of leave)</p> <p>-Some supervisors and mechanics felt that leave among their coworkers had an unfavorable impact.</p> <p style="text-align: center;">(Morale)</p> <p>-Wage grade employees felt morale in their work centers to be neutral to low.</p> <p>-Supervisors and staff personnel felt morale in their work centers to be neutral to high.</p>	<p style="text-align: center;">RELATIONS WITH OTHER GROUPS IN UP-1H SYSTEM -3-</p> <p>-Supervisors and mechanics saw PSA to be the most cooperative group.</p> <p>-No other group was mentioned frequently to be most cooperative.</p> <p>-PC was seen as the least cooperative group by other groups, although this was not considered to be PC's fault. It was frequently mentioned that PC did the best it could, but that it was just not enough.</p> <p>-Inspectors said that dealing with Maintenance supervisors was a difficult part of their job.</p>	<p style="text-align: center;">RELATIONS OUTSIDE THE UP-1H SYSTEM -4-</p> <p>-When asked specifically, many mechanics, electricians, inspectors, and some supervisors said that 190h's were a source of frustration.</p> <p>-The original idea has lost its effectiveness--it is not a fair and equal process.</p>

RELATIONS WITH SUPERVISORS  
-1-  
RELATIONS WITH CONCORDERS  
(In work context)  
-2-  
RELATIONS WITH OTHER GROUPS  
IN UP-1H SYSTEM  
-3-  
RELATIONS OUTSIDE  
THE UP-1H SYSTEM  
-4-

FIGURE 3 SOCIAL SYSTEMS GRID\* (Page 6)

RELATIONS SOCIAL FUNCTIONS	RELATIONS WITH SUPERIORS -1-	RELATIONS WITH COLLEAGUES (in work context) -2-	RELATIONS WITH OTHER GROUPS IN UH-IH SYSTEM -3-	RELATIONS OUTSIDE THE UH-IH SYSTEM -4-
<p>"L" LONG TERM DEVELOPMENT</p>	<p>-Many wage grade and most staff employees saw their bosses to be concerned with the "big picture" or the depot mission. This is a positive response.</p> <p>-Few employees interviewed reported being trained by their supervisor. This is detrimental toward long term development.</p>	<p>-Many wage grade interviewed reported receiving on-the-job training from coworkers; this was seen to be beneficial. This is neutral to positive in terms of long term development.</p>	<p>-Some wage grade say that they would like more cross-training.</p>	<p>-Inspectors and some wage grade say that formal training (coordinated by T and D) is beneficial and that even more such training would be useful.</p> <p>-Supervisors say that their formal training has been of less benefit, and that formal management training is lacking.</p> <p>-Many personnel interviewed said that promotional opportunities were limited and that more stress on "merit" for promotional consideration would be beneficial.</p>

### QUALITY OF WORKING LIFE (QWL)

The experience of people at work can be assessed by asking people about the best, and most difficult parts of their jobs, and the major sources of morale. Quality of working life is a concept that describes the demands of employees with respect to their individual needs. The CCAD interviews revealed much in common among the various roles as the following list shows.

#### QWL ACHIEVEMENTS

(What employees like about work at CCAD)

- ACCOMPLISHMENT IN  
A/C OVERHAUL (supervisors, mechanics)
- CHALLENGE (supervisors, inspectors, some mechanics)
- PAY (mechanics)
- SECURITY (mechanics)
- VARIETY (some mechanics)
- INTERESTING WORK (PPC)
- A QUALITY PRODUCT, &  
WORKING WITH PEOPLE (inspectors)
- LEARNING (expeditors, some mechanics)

#### QWL OPPORTUNITIES

(What employees say they want)

- IMPROVED SUPERVISION
- IMPROVED COOPERATION THROUGHOUT CCAD
- INCREASED RECOGNITION
- INCREASED PROMOTIONAL OPPORTUNITIES &  
IMPROVED PROMOTION SYSTEM
- IMPROVED WORKING CONDITIONS

These opportunities are contained (in different terms) in the recently published CCAD "Philosophy Statement." The relevance of that philosophy is thus further validated, and its importance further emphasized.



### CONCLUSIONS

The UH-1H program in CCAD has a social system which is achieving technical success, but not to the degree possible--especially in coping with delays due to parts availability and in interpretation of specifications and standards. Further, the integration among the various roles required to work together is lower than ideal and the resulting costs in system morale and effectiveness are notable.

We are seeing complex and stressful relations around the control of the key variances of quality of work completed, and of parts/material availability, and to a lesser extent, of repair required.

Although many of those interviewed reported high teamwork among their coworkers, not much teamwork was evidenced within work centers in controlling the variances above. Although the work centers contain people who seem to like one another, major variance control activities are reported between work center groups--not within them. Further the relationships between groups is often strained and/or confused.

However, much system strength is also evidenced in the interview results--and the human resource available at CCAD is impressive. Employees say they enjoy producing aircraft, and they want improved cooperation with others. A sense of depot mission is described, but that mission is apparently seen as overhaul primarily, and distribution to a lesser degree. D/Supply is largely unmentioned in the interviews. The link between delays in overhaul and effectiveness in customer delivery is largely glossed-over or ignored.

The social analysis results speak to improvement in timely A/C overhaul--and this is important. The question of simplifying and enlarging mechanics' role in parts ordering/scheduling/forecasting is raised by the clear indications of distinction and separation between the overhaul activity and the parts and material supply to the line. The question of greater involvement of mechanics in defining specifications and standards is clearly raised by the obvious misunderstanding and confusion at large in the system.

CCAD SOCIAL SYSTEM SUMMARY

TABLE 1

CELL G 1

- 33% of mechanics, electricians and other wage grade report that their supervisor helps them get parts and materials
  
- 17% of mechanics and other wage grade report that their supervisor helps them challenge Q.C. (no electricians say this)
- 66% of mechanics report that their supervisor is technically knowledgeable
- supervisors do not report getting help from management in dealing with their problems

CELL G 2

- mechanics do not report discussing parts availability with each other ("its every man for himself on the floor")
- 33% P.P.C. report discussing parts availability with each other
- 25% mechanics electricians and other wage grade report discussing write-ups with each other
- 33% P.P.C. report discussing write-ups with each other
- 75% inspectors report discussing write-ups with each other

CELL G 3

- 50% supervisors report contacting production control daily concerning parts
- 25% supervisors report contacting supply
- 16% supervisors report contacting other shops
- 30% report robbing back first before they contact anybody
- 50% mechanics report contacting production control daily concerning parts. (This is usually viewed as a negative experience)
- 40% mechanics report rob backs and scrounging for hardware
- 66% electricians report contacting PPC about parts
- 40% PPC report contacting supply about parts and materials
- 33% expeditors report contacting supply about parts
- 33% expeditors report contacting support shops about parts (tend to avoid the prime shops - find them less cooperative)

Asked to identify major issues between mechanics and expeditors,

- 12% supervisors report availability of production control personnel
- 12% supervisors report communication
- 40% mechanics report availability of parts
- 15% " " shortage/skill level of expeditors
- 14% " " lack of cooperation
- 12% " " communication
- 50% PPC report ordering parts
- 33% expeditors report communication of information by mechanics
- 33% inspectors report communication
- 70% mechanics report some discussion with QC regarding write-ups (30% - a lot, 40% - a little)-of these, 20% challenge QC directly.

- of the 30% mechanics who report no discussion with QC regarding write-ups, 33% are resigned ("fix it, whatever it is to keep them off your back - you can't fight city hall") while 25% accept all QC write-ups as legitimate.

Asked to identify major issues between QC and mechanics

- 20% supervisors reported inconsistent standards
- 20% supervisors reported goldplating

Table 1 (cont)

- 20% supervisors reported lack of skill and inexperience of new inspectors
- 12% mechanics reported inconsistent standards
- 12% " " goldplating
- 12% " " no issues
- 33% electricians reported write-ups
- 33% " " goldplating
  
- 50% inspectors reported interpretation of standards
- 20% inspectors reported quality of work
- 20% " " no issues
- 12% mechanics report daily contact with PSA about depth of repair (viewed as a positive experience)
- 50% mechanics report using shop travellers (10% report they need updating)
- 25% supervisors report using shop travellers (don't report they need updating)
- 37% mechanics report they are not aware of any problems between QC and PSA.

CELL G 4

- 12% supervisors report contacting prime shops daily about parts
- 25% of mechanics who obtain parts themselves report doing so from prime shops
- 33% PPC report contacting MRC about parts
- 33% expeditors report contacting prime shops daily about parts

CELL A 1

- 50% supervisors report discussing special programs with management.
- 40% mechanics report discussing special programs with their supervisor
- 13% other wage grade report discussing special programs with their supervisor

Table 1 (cont)

- 10% supervisors report discussing vendor shortages with management
- 30% mechanics report discussing vendor shortages with supervisor
  
- 13% other wage grade report discussing vendor shortages with supervisor
- 16% supervisors report discussing criteria changes with management
- 40% mechanics report discussing criteria changes with supervisor
- 13% other wage grade report discussing criteria changes with supervisor
  
- 17% supervisors discussing customer complaints with management
- 33% mechanics and inspectors report discussing customer complaints with supervisor
- 12% other wage grade report discussing customer complaints with supervisor

CELL A 2

- 13% other wage grade report discussing special programs with coworkers
- 33% inspectors report discussing customer complaints with coworkers

CELL A 3

- 33% supervisors and 30% mechanics and electricians report discussing vendor shortages with PC
- 70% PC report discussing special programs with expeditors
- 20% inspectors report discussing special programs with maintenance supervisors
- 25% inspectors report discussing vendor shortages with PC
- 33% inspectors report discussing customer complaints with mechanics
- 25% inspectors report discussing customer complaints with maintenance supervisors
- 25% inspectors report discussing criteria changes with maintenance supervisors

Table 1 (cont)

CELL A 4

- 33% supervisors and inspectors report discussing criteria changes with TSARCOM engineering
- 40% PC report discussing vendor shortages with procurement
- 40% PC report discussing special programs with MRC

CELL I 1

- 36% supervisors report management informs well
- 50% mechanics " supervisor " "
- 20% electricians " " " "
- 50% other wage grade report supervisor informs well
- 36% PC " " " "
- 75% expeditors " " " "
- 60% inspectors " " " "
  
- 40% supervisors report management respects opinion/ideas
- 66% mechanics " supervisor " "
- 20% electricians " " " "
- 33% other wage grade report supervisor respects opinions/ideas
- 60% PC " " " "
- 55% expeditors " " " "
- 75% inspectors " " " "
  
- 33% supervisors report their manager as good leader
- 33% mechanics report supervisor as good leader
- 25% electricians " " " "
- 33% other wage grade report supervisor as good leader
- 64% PC " " " "
- 66% expeditors " " " "
- 43% inspectors " " " "
  
- 53% supervisors report management treats them fairly
- 25% mechanics report supervisor treats them fairly
- 10% electricians " " " "
- 40% PC " " " "
- 33% expeditors " " " "
- 66% inspectors " " " "

Table 1 (cont)

The following report good supervision as an important element in morale

- 25% supervisor
- 20% mechanics
- 10% electricians
- 16% other wage grade
- 50% PC
- 14% inspectors

CELL I 2

- 66% supervisors report their center works well as a team
- 50% mechanics " " " " " "
- 25% electricians " " " " " "
- 25% other wage grade " " " " " "
- 100% PC " " " " " "
- 66% expeditors " " " " " "
- 100% inspectors " " " " " "

- 33% supervisors, mechanics, 40% electricians and other wage grade report leave as having an unfavorable impact
- 75% PC and inspectors report no problem

Level of morale in work centers was reported as follows

	<u>low</u>	<u>average</u>	<u>high</u>
supervisors	10%	36%	30%
mechanics	33%	33%	25%
electricians	60%	15%	10%
other wage grade	20%	40%	25%
PC	30%	40%	30%
expeditors	22%	22%	50%
inspectors	14%	14%	66%

Table 1 (cont)

CELL I 3

Most cooperative group ( daily contact )

- 20% supervisors report PSA
- 20% supervisors " PC
- 20% supervisors " QC
- 14% mechanics " PSA
- 50% electricians " other structures
- 67% expeditors " support shops
- 25% inspectors " assembly line

Least cooperative group ( daily contact )

- 20% supervisors report PC
- 20% mechanics " PC
- 20% " " no problems
- 33% electricians " PSA
- 25% " " PC
- 25% " " QC
- 50% expeditors " no problems
- 20% inspectors " maintenance supervisors
- 33% " " no problems
- 20% PC " supply
- 20% " " shop PC

CELL I 4

- 25% supervisors report 190H a source of frustration
- 50% mechanics " " " " "
- 50% electricians " " " " "
- 25% other wage grade " " " " "
- 66% inspectors " " " " "
  
- 12% supervisors report deal directly with prime shops - a cooperative experience
- 33% expeditors report deal directly with prime shops - find them unresponsive



Table 1 (cont)

- 16% mechanics report lack of formal training
- 20% electricians report lack of formal training
  
- 12% other wage grade report training by outsiders
- 25% other wage grade report training was beneficial
- 17% other wage grade report lack of formal training
  
- 36% inspectors report trained by T & D
- 66% inspectors report was beneficial
- 25% inspectors report lack of formal training

FORMATIVE EVALUATION IV  
OF THE SOCIOTECHNICAL SYSTEMS EVALUATION PROGRAM  
AT CORPUS CHRISTI ARMY DEPOT

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January 1983

SCOPE OF THE EVALUATION

This evaluation covers the activities beginning with the 28 October 82 In-Process Review (IPR), the IPR of 15 December 1982, the data collection effort, and ending about 31 January 1983. During this time period, the STEP Design Group recommendations presented at the 1 September 83 IPR were further developed, preparation was made for the transition into the implementation phase of the STEP process, and implementation was begun.

This formative evaluation will be limited to descriptions of the IPRs, the definition and collection of data for use in the evaluation of the project, and other related observations. Wherever possible, this report will include an assessment of the process and progress of STEP activities and any recommendations considered useful in the implementation of the project.

THE 28 OCTOBER IN-PROCESS REVIEW

Description

The materials for this IPR were presented by a representative from the STEP Design Group to the CCAD Commander and his key management staff. Also present were a representative from DESCOM, two representatives from ARI, and one of the socio-technical consultants for the project.

Copies of the Philosophy Statement (Appendix A) were circulated and accepted without discussion. The STEP Design Group (SDG) Recommendations (Appendix B) were also distributed. This lists all twelve recommendations of the SDG and provides an overview of the progress on each. Each recommendation was presented and discussed in detail. Highlights of each discussion follow:

1. Maintenance Verifier positions. Creation of these positions has been approved by DESCOM. These individuals will work as "work leaders," "inspectors," "supervisors," and "trainees" and report directly to the shop supervisor. There was some discussion of the title for these positions but no major objections.

2. Transfer of PPC Forecasting function to Directorate for Supply. This transfer appears to be generally desirable, but implementation is contingent on DESCOM approval. The desirability of transferring the entire forecasting function and not just Airframes was discussed, but further action on this was deferred until DESCOM processes the part transfer.

3. Transfer of PPC Pre-Shop Analysis to Directorate for Quality Assurance. This is probably the "cleanest" move and will result in PSA now wearing a "quality as well as cost hat." If successful, engine PSA may be transferred next.

4. Airframes Production Control function to PPC Division. Position descriptions need to be written to mesh functions and to be all-inclusive. Classification for pay purposes will acknowledge skills and knowledges and not just performance.

5. ASTORS transferred from Airframes to PPC Division. No DESCOM problem and transfer should be relatively easy.

6. Realignment of Airframes Shops. Despite some earlier opposition and some superficial problems with the disruption of the shop numbering system, this is a valid recommendation to be milestone for a smooth transition.

7. Assembly line movement and clean-up. An initial five WG-2 positions have been created under the overhire authority to perform these functions. These are not dead-end jobs but stepping stones to other positions. Significant training in safety and procedures for moving aircraft will be required, as well as close supervision.

8. Mechanic certification. Mechanics are a strong constituency for this recommendation. Union coordination will be required on this recommendation. A field trip is planned to observe and learn more about the program at the Red River Army Depot.

9. Hardware carousel. The acquisition of a carousel should significantly reduce mechanics' time to get nonkitted parts and materials. This recommendation is still in the evaluation stage.

10. Supervisor/management training. Training is needed. The Office of Personnel Management may be of assistance. The Leader Management Development Course (LMDC) is still planned. The 54 or 55 supervisors will be trained in small groups so that there will be minimal disruption to the operation of the Depot.

11. Streamlining of aircraft flow. Although this is a more long-range and costly recommendation, at least some changes should be possible in the near future.

12. Reduction of dead-end jobs. Despite general agreement about the merits of this recommendation, a tentative list of dead-end jobs revealed that there is no universal definition of dead-end jobs and that the remedies are complex. One remedy is the existing upward mobility program. -

General discussion. The project is pretty much on schedule, but we (the Depot) need to develop and start the milestones. This will require considerable coordination. Training of supervisors should be started soon. Results of STEP should soon become visible to entire staff, since the announcements for the Maintenance Verifier positions are already in print. It is essential for all managers at this point to go out and communicate with their staff about STEP and the depth of the analyses behind the recommendations. The Philosophy Statement, developed by the CCAD Commander, the Depot management staff, and the SDG, was adopted as the official "CCAD Philosophy" to be printed and disseminated throughout the Depot.

### Evaluation

Despite earlier reservations by some managers at CCAD about some of the proposed STEP recommendations, this IPR served to pull everyone together for a unified and concerted effort to make STEP work. Under the strong leadership and with the fullest support of the CCAD Commander, all program managers and principals involved were charged to prepare for implementation. It was emphasized that an important part of this would be to disseminate information and support for STEP to all CCAD personnel, particularly to those most directly affected by the changes.

The Commander's directive to retitle, print, and distribute the Philosophy Statement throughout the Depot was particularly effective in consolidating all forces and emphasized that this was an important project to which CCAD was fully committed.

THE 15 DECEMBER 1982 IN-PROCESS REVIEW

### Description

The materials for this IPR were presented by another representative from the Design Group to the CCAD Commander and his key management staff. Also present were the Deputy of DESCOM Headquarters, three other DESCOM representatives, an ARI representative, both socio-technical consultants and several visitors from other Army Depots.

Appendix C, showing the progress made on each recommendation, was distributed to all attendees. Each STEP recommendation was presented and discussed openly and frankly. One purpose of this IPR was to get everyone (including the Commander, who had spent considerable time away from the Depot) "caught up" on what had happened since the IPR on 28 October 82.

1. Assembly line movement and clean-up. All "mover" positions have been filled and the first phase of training has been completed. The Director of Maintenance indicated that filling those positions is a "real plus," especially for the UH-1H line and that it would be desirable to have more of these positions for other lines as well. Originally designed to be "free-floating," practical considerations determined that the "movers" should be assigned to an individual supervisor on each line. The result of these positions should be a decrease in indirect manhours per aircraft for the journeyman mechanics.

2. Mechanic Certification. A CCAD team (not including the Commander, as was originally planned) had visited Red River Army Depot (RRAD). It soon became apparent, however, that the proposed voluntary certification for diagnostic purposes had evolved more into a proposal for performance testing for merit promotion. It was determined that further discussion would be needed of this new development and that a 15 January 1983 date for implementation of this recommendation would be premature. The Civilian Personnel Office (CPO) was charged to initiate a dialogue with the union and other interested parties to develop some realistic milestones (by 15 Jan) to start exploring the requirements (e.g., standards, location, procedures) for this program. CPO estimated it will take 3-6 months to develop a performance testing system. In general, this recommendation for a mechanic certification process was still considered very attractive, particularly in light of the mention that RRAD tested 1200 people with not a single filed grievance.

3. Hardware carousel. Although some contacts had been made with vendors, not everyone felt sufficiently involved in the process. The Director of Maintenance expressed an interest in being more involved and was charged to take the lead. The DESCOM Deputy volunteered DESCOM's assistance in obtaining this procurement.

4. Supervisor/manager training. The presentation of this recommendation was confusing and it became evident that more than one type of training was involved. There is ongoing CCAD training; there is the Leader Management Development Course (LMDC), new supervisor training to be developed, and special training to facilitate the implementation of STEP. The last type of training proposed would be a "cascading system" where information and role clarification (as a result of STEP) would filter down from top management to mechanics in about four stages or levels of management.

The Organizational Effectiveness Center and School (OEC&S) were asked to help develop some portions of the training but apparently were unable to comply within the time-frame required. The DESCOM Deputy offered the assistance of the 15 DESCOM Organizational Effectiveness Consultants, but it was indicated that CCAD would be able to handle this requirement with its in-house resources.

5. Streamlining of aircraft flow. There had been no movement on this recommendation and resources (engineers) had been scarce. The Commander wanted to get moving on this and, when asked, permitted the Director of Maintenance to assign an engineer to work on this full-time.

6. Reduction of Dead-end Jobs. A "Dead-end Job plan," contained in Appendix C was advanced by the SDG. There was considerable negative reaction to the plan, and the Civilian Personnel Office (CPO) apparently had not yet fully concurred and approved the plan at all levels. It became evident that the definition of "dead-end jobs" and their relationship to upward mobility jobs or programs required considerable development. CPO was charged to develop a plan and the SDG was directed to leave the staffing of their recommendations to the "experts."

7. Maintenance Verifiers. Announcements were issued, applications were received and rated, and a register was developed for two positions. However, there was widespread concern that the register did not include the highest qualified applicants. The SDG has developed an options paper to be discussed with the Commander and others to determine how best to proceed.

8. PPC Forecasting function to Directorate of Supply. As easy as this recommendation sounded, there was considerable "heartburn" involved in this reorganization. Implementation was not automatic and since there were possibilities of adverse actions for some employees, formal RIF procedures might be necessary. This caught the attention of the DESCOM Deputy who stated that DESCOM was led to believe that there wouldn't be any RIFs. After some further discussion it became apparent that the word "RIF" may have been too strong and that the personnel actions required were actually typical agency personnel actions when there is an internal reorganization. The magnitude of the problem, however, would not be known until notifications of transfer actions could be responded to by those involved. CPO was directed to start the process so that the magnitude of the problem would be known.

The Commander volunteered to talk with anyone or any group to help facilitate the implementation of these changes.

9-12. The remaining STEP recommendations, pertaining to the reorganization and the realignment of Airframes Shops, were not specifically discussed, although there was a brief discussion of the key variances to be used in the STEP evaluation. It was suggested that DESCOM would want to track these measures if they were that useful.

The Director of Maintenance then spent about 20 minutes outlining the extent to which STEP impacts on his division and the extent to which his division was already charged with responsibility for a considerable number of other priority projects, not to mention the mission. He reaffirmed his support for the STEP process, but called for an independent auditor or controller to more closely monitor the implementation of STEP and to set priorities for the allocation of resources.

The "Lessons Learned" (included in Appendix C) by the SDG were not presented or discussed due to lack of time.

The Commander assured everyone that STEP would be put back on track and that CCAD was fully committed to make STEP a success. This challenge was echoed by the Deputy of DESCOM who pledged DESCOM's total support for the project and promised to help in whatever way he could.

The IPR was adjourned, after tentatively scheduling the next one for 1 February 83. There was general consensus that a 15 Jan 83 IPR and ribbon-cutting ceremony for the implementation of STEP would be premature and that more work would need to be done.

### Evaluation

Throughout this IPR there was little evidence of tangible progress towards the implementation of STEP. This is not to say that there had not been significant accomplishments since the last IPR, only that the accomplishments were not evident. Some of the accomplishments are included in Appendix D. Preparation for this IPR was also incomplete. This was evident not only in the lack of "readability" of the briefing slides but also in terms of a lack of coordination. There were many "surprises," most of which might have been avoided if there had been closer coordination and cooperation among the principals involved. This lack of preparation may be attributed, in part, to the short time-frame with which the IPR had to be prepared--a time frame which the SDG unsuccessfully tried to expand.

Additional confusions seemed to be due to vague role definitions among various CCAD units involved in the implementation of STEP. This made it difficult for the individuals involved to know precisely the limits of their roles and the areas of their responsibility. This combination of limited coordination and vague role definition may have contributed to some of the frictions, "turf" problems, and difficulties that surfaced during the IPR.

Another factor contributing to the limited progress may have been the unclear allocation of resources. What seemed needed was a more precise statement of the priority of STEP, relative to other CCAD projects.

Despite the external manifestations and difficulties that surfaced during this IPR, the STEP project was progressing. Most of the difficulties could be readily remedied with some appropriate leadership and management attention. The Commander gave every indication that this would be the case. Throughout the IPR, he specifically tasked different CCAD units to perform various functions necessary for the implementation of STEP. His permission to the Director of Maintenance to assign one engineer to work full-time on one of the less-pressing recommendations clearly indicated that STEP had high priority status.

The openness and frankness of the IPR demonstrated unusual courage on the part of CCAD's management and was extremely useful in identifying and clarifying potential difficulties. However, outside visitors and guests, unprepared and unfamiliar with CCAD and STEP, may be expected to leave the IPRs with less than accurate impressions of the merits or shortcomings of this particular project. Separate briefings of STEP to outside visitors and guests may be more useful and meaningful.

## DATA COLLECTION

### Background and Description

Shortly after the 28 October 82 IPR, negotiations were continued to define the baseline data that would be necessary for ARI to assess properly the impact of STEP on the productivity and working life at CCAD.

Three issues required resolution. First, clarification was needed of the list of variables (measures) that had been developed on 9 July 82 in a meeting with the CCAD Commander and his staff. Second, the desirability of including FY82 in the baseline period required discussion. Third, it was necessary to establish a single point of contact responsible for coordination of all of the data collection.

Several discussions and working sessions were held with key CCAD personnel to help define and clarify the measures that would be potentially useful in the tracking and assessment of STEP. ARI requirements were detailed in full so that CCAD personnel assisting in the gathering of the data would be more able to help identify and select meaningful data from the large volume of available information. The list of measures and general guidelines is contained in Appendix E. As the project progressed, this list was expected to change.

Discussions were also held concerning the use of FY81 data as a baseline. This was initially proposed because FY82 was atypical of CCAD production. However, there are too many problems associated with the sole use of FY81 data. First, FY81 data had already been "scrolled up" (consolidated) for the year for many of the measures of interest, making it impossible to determine monthly trends or to conduct analyses at the work centers level.

Second, there are no guarantees that FY83, the implementation year for STEP, would not also be atypical. If so, FY82 would be the better baseline and would be more current. Unlike FY81 data, FY82 data would still be available on a month-to-month basis for many of the measures proposed and would be obtained by work center, if feasible. This latter feature will permit work center comparison. This is particularly useful in sorting out the unique contributions of STEP to any productivity changes that might be recorded.



Based on these discussions, it was decided that FY82 would also be accumulated and that a monthly collection system would be put in place to gather FY83 data while STEP was being implemented.

During these meetings, plans were also made to administer specially developed surveys (Appendix F) to all the supervisors and to a stratified random sample of the employees in the Airframes Division. The surveys were designed to solicit both subjective and objective data about the organizational structure at CCAD, the level of technology employed, productivity, and the quality of working life. A complete listing of these organizational variables and the survey questions used to assess each variable are contained in Appendix G.

It was agreed that the Organizational Effectiveness Consultant at CCAD would make the arrangements for a large testing room and for assuring that all research participants would attend the survey session. An ARI researcher would administer the surveys to enhance employee cooperation in the project and to ensure the confidentiality of the responses. ARI was also to provide the sampling plan (Appendix H) and the names of individuals to be surveyed.

The third issue to be resolved was the establishment of a central point of contact for gathering all the data. This was necessary because at that time both the SDG and the DESCOM Headquarter's Resources Management and Evaluation Division were separately collecting productivity and quality of working life measures, each with a different focus. It was decided that it would be best if all measures, regardless of focus, were centrally collected and that this lead role be vested in the Chief of the Resources Management and Evaluation Division. The SDG would be available to assist and help interpret the data, particularly the key variance measures they developed.

### Progress and Evaluation

From the time of the 28 October 82 IPR to the 15 December 82 IPR, there was relatively little tangible progress made on the collection of the CCAD measures, although the administration and collection of the survey data was successful. The slow progress on the CCAD data collection during this period coincided with the general lack of direction of STEP during this period and "came to a head" at the 15 December 82 IPR. Insufficient resources were allocated to this effort in that the lead person was almost immediately detailed to another project and no replacement was made. When a replacement was designated, this individual was also detailed, so that a concerted effort to accumulate data did not start until early January 1983. More recent conversations with CCAD indicate that all the FY81 and most of the FY82 data have been gathered, although ARI has not yet been able to review the data to determine its completeness or potential utility.

More success was encountered in the collection of the survey data. As scheduled, arrangements had been made to survey 329 employees and 42 supervisors in 7 administrations. The outline of the procedures and instruction used in administering the surveys is shown in Appendix I.

Due to the use of a dated employee roster and a decision not to permit supervisors to make any substitutions, only 68% of the 329 scheduled employees originally reported for the survey. Two special makeup sessions were subsequently scheduled to bring this response rate up to 82%. Of the 42 supervisors asked to participate in the survey, only 23 were able to attend. This was due, in part, to a substantial number of these supervisors being away from the Depot to attend a course. A mailout was planned to reach these supervisors and the OE consultant was designated the contact point and coordinator. By early January, he was able to administer and collect 14 more surveys for a total response rate of 88%.

### Preliminary Survey Analysis

Preliminary analysis of the data confirmed the cooperativeness of the survey respondents. Although providing the social security number was clearly voluntary, over 85% of the respondents provided their full social security number.

Despite encouragement to include written comments, only 8.5% of the respondents chose to do so. These comments, edited slightly for clarity and to maintain confidentiality, are contained in Appendix J. In general, the comments were constructive and confirmed the findings of the socio-technical analysis conducted by the SDG.

The comments indicated considerable positive energy and constructive force, although tempered with skepticism. A significant number of comments addressed perceived unfairness in personnel selections, promotions, and assignments. Technically inept and uncaring supervisors/managers were mentioned several times. There were also some perceptions that minimal work effort is all that is needed to get by and that additional efforts go unrewarded and unnoticed. There also seem to be some concerns about the physical characteristics of the work place (i.e., too hot, too cold, no electrical outlets).

It must be noted that the STEP recommendations were designed to directly address these concerns, e.g., supervisor/manager training, mechanic certification, and elimination of dead-end jobs.

### Recommendations

Based on observations during the IPRs, discussions with key CCAD personnel, and informal communications with the employees and supervisors assembled for the surveys, the following recommendations were advanced and discussed with the SDG on 15 December 1982:

1. Increase dissemination of information about STEP to CCAD employees. Many of the workers were still uninformed or misinformed about STEP and either did not read or notice the STEP newsletters or the articles in the Aircraftsman. Direct personal contact on the worksite

would be most desirable in order to dispel any perceptions of the STEP operation as an "ivory tower" operation. Exposing the rank and file to the enthusiasm and dedication of the SDG would be advantageous. Similarly, broader awareness of the Commander's personal commitment to STEP would go a long way in dispelling the concerns voiced by some.

2. Coordinate more closely with the proponents tasked to implement the various STEP recommendations. This is important because it shows continued commitment to the recommendations and fosters an atmosphere of cooperation on a joint effort. It also helps ensure that the spirit and intent of the recommendations are properly conveyed and permits SDG to monitor more closely progress on their implementation.
3. Increase documentation of STEP meetings, recommendations, and activities. No formal minutes, even of the IPRs, are kept and agendas of meetings with key officials are seldom put on paper. Such written records are indispensable in determining what was said (decided) by whom, to whom, and when. It is important to leave a paper trail of what was done here at CCAD, not only so that others can learn from the experience, but also because it serves to define more clearly accountability and responsibility.
4. Make greater use of written proposals, ideas, and plans. This medium is most useful because it permits wide dissemination. This not only provides information, but it gets more people involved in the planning and development of the final recommendation. A good example of the use of this approach was the SDG proposal (11 December 82) to remedy some concerns generated over the referral lists for the Maintenance Verifier positions.
5. Designate liaisons between the SDG and proponents tasked to implement STEP recommendations. Members of SDG can be more clearly designated and assigned to act as monitors and points of contact for proponents. This will ensure a less diffuse distribution of responsibility and will help ensure that at least one SDG member will be fully informed about each major activity.
6. Tap the resources of the younger workers. Although there are relatively few younger (less than 30 years old) workers at CCAD, these individuals are an untapped resource. Many have considerable energy and a strong desire to improve productivity and the quality of working life at the Depot. Unfortunately, they do not perceive that their ideas will ever make a difference. This is not consistent with the STEP philosophy.

7. Finally, designate a high-level steering committee to implement STEP. This committee should consist of CCAD managers that have the ability to "make things happen". The committee should meet regularly, (perhaps weekly) to monitor progress on the STEP implementation plan. Members of the SDG would report directly to this committee and would assist the committee in monitoring progress.

It must be noted that to a large extent these recommendations echo and complement the "Lessons Learned" as outlined by the SDG in the material for the 15 December 82 IPR.

#### UPDATE (31 January 1983)

Since the 15 December 82 IPR, considerable progress has been made and many of the deficiencies that precipitated some of the above recommendations have been remedied. No small credit for this goes to the Commander and to the 15 December IPR that so clearly helped focus the areas of greatest need.

The Director of Resources Management has been charged with responsibility for implementing STEP and sufficient progress appears to have been made on the transfer of personnel actions to permit a ribbon-cutting ceremony to "kick-off" officially the implementation of STEP on 19 January 83. As originally scheduled, the SDG was dissolved as a group on 15 January 83. However, the SDG members continue to monitor progress and will be convened, as needed, to coordinate and facilitate STEP implementation.

Coordination seems to be enhanced now that CCAD management is fully responsible for STEP implementation and a complete file, tracing the STEP project is being assembled. Also, the sociotechnical consultants have been commissioned to prepare the case study for STEP as part of their contract with DESCOM. Since they have been most intimately involved with the project and have the requisite technical expertise, they are ideally suited to provide this documentation.

APPENDIX A

CCAD PHILOSOPHY STATEMENT

JOINT EFFORT OF THE COMMANDER, THE STEP DESIGN GROUP, AND THE TOTAL DEPOT MANAGEMENT STAFF TO EMPHASIZE THE DEPTH OF THEIR COMMITMENT

WE FIRMLY BELIEVE THAT IMPROVEMENT OF PERFORMANCE AND QUALITY OF WORKING LIFE IN THIS DEPOT DEPENDS PRIMARILY ON THE ABILITY, DESIRE, AND COMMITMENT OF ITS PERSONNEL. WE ALSO BELIEVE THAT EMPLOYEE COMMITMENT WILL BE ACHIEVED BY MANAGING HONESTLY AND FAIRLY, IN A WAY THAT IS SENSITIVE TO THE NEEDS OF THE WORKFORCE.

IN APPLYING THIS PHILOSOPHY, WE WILL STRIVE TO:

1. Consider each employee a trusted and valuable member of the organization, responsible for contributing to the organizational goals.
2. Encourage each employee to provide input on issues and be involved in decisions concerning their working life.
3. Provide a working climate conducive to integrity, initiative, ingenuity, new ideas and constructive criticism, considering individual needs and employee dignity.
4. Encourage an open and meaningful two-way communication to improve our effectiveness in working with others.
5. Provide a clean, healthy, safe, and harmonious working environment.
6. Provide opportunities for development, training, growth on the job, and prospects for advancement to all employees in keeping with Depot requirements.
7. Provide opportunities and information to prevent dead-end careers.
8. Provide timely information directly to the employees who need to act on it.
9. Create an environment that encourages and supports effective leadership at all levels.
10. Provide awards, recognition, and counseling to employees based on knowledge, skills, and performance that contribute to Depot goals.
11. Assure that affirmative action is taken in accordance with merit promotion principles.

APPENDIX B

STEP Recommendations and Status for the 28 Oct In-Process Review

(Briefing Materials)

<u>RECOMMENDATION</u>	<u>ACTION COMPLETED</u>	<u>ACTION PENDING</u>
<p>Assembly Line Movement and Clean-Up</p>	<p>Duties have been identified and job descriptions written and submitted to P&amp;PC. Training plan has been developed. Authority has been granted for temporary overhires. Spaces will come from Dir, Maint.</p>	<p>Coordination of training plan with POC, Dir for Maint. Job analysis and recruitment action by CPO, R&amp;P; classification by P&amp;PC.</p>
<p>Mechanic Certification</p>	<p>Held a meeting with COL Clark to discuss observing Red River Army Depot performance testing as it applies to mechanic certification. Verbally contacted the union and CPO concerning trip to RRAD.</p>	<p>Trip to RRAD to observe performance testing in action and gather information for CCAD program. Further development of this recommendation will be contingent on information gathered at RRAD.</p>
<p>Hardware Carousel</p>	<p>Met with Production Engineering Division to discuss implementation of this recommendation. DF submitted to Pdn Engr Div requesting engineering support.</p>	<p>Economic Analysis. Determination of volume and specifications. Compatibility with Shop Floor System and ASRS. Salesmen presentations.</p>
<p>Supervisor/Management Training</p>	<p>Determined training that is critical for successful implementation of the recommendation. Developed outline for training. DF submitted to Dirs for Maint, Supply and QA requesting POC for this training.</p>	<p>Structure supervisor implementation orientation, team building, and inter-team relations course. Coordinate training plans with POC. Establish priority for LMDC courses. Develop long-range on-going training. Write CGS's.</p>
<p>Streamlining of Aircraft Flow</p>	<p>Conducting meetings with personnel from PED and ASTORS, as well as the Commander and the Dir, Maint. Discussion centered on the actions required to accomplish the streamlining of A/C flow.</p>	<p>A DF will be forwarded to PED identifying all changes/moves on actions concerning streamlining and ask which can be implemented at this time, which will require MCA funding, which cannot be done because it has to be done in conjunction with an MCA project; for example, inclosing area between Hangars 44 and 45.</p>

<u>RECOMMENDATION</u>	<u>ACTION COMPLETED</u>	<u>ACTION PENDING</u>
Reduction of Dead-End Jobs	Definition of dead-end job has been developed. Received information on past actions on dead-end jobs from P&PC Br.	Awaiting list of work centers that have dead-end jobs from P&PC Br. Develop plan of action and implement (to include follow-up).
Work Leader (Maintenance Verifier)	The job description for the work leader has been written, coordinated, and classified by P&PC. Job analysis has been completed by R&P. Subject matter experts have been identified and crediting plan has been developed. Training plan outline drafted and sent to POC for coordination. Promotional Bulletins are in print for AWC and Painter.	Promotional bulletins to be issued. Panel to establish register. Selection and Personnel actions. Implementation, orientation and critical transition training to be conducted.
PPC Forecasting Function to Dir, Supply	The job description for the forecasting personnel has been written. The spaces for this function have been identified and a request for a TDA change has been submitted. Concept plans for this action have been forwarded to DESCOM.	Awaiting official response from DESCOM on the concept plan before implementation can be accomplished.
PPC Pre-Shop Analysis Function to Dir, QA	Concept plans have been accomplished and forwarded to DESCOM.	Awaiting official response from DESCOM on the concept plan. Training plan will include team building and role definition.
AFRM Production Control Function to PPC Division	Spaces have been identified. Job descriptions have been written and presented to CPO. Concept plans have been written and forwarded to DESCOM. Training plan has been drafted.	Awaiting classification of job descriptions from CPO. Coordinate training plan with POC.

ACTION PENDING  
Awaiting official response from  
DESCOM on the concept plan.  
Draft training plans and job  
description changes.  
  
Will meet with DMIS to discuss  
impact of realignment.  
DF to Force Development requesting  
TDA change.

ACTION COMPLETED  
Concept plans written and forwarded  
to DESCOM.  
  
Meetings conducted with supervisors/  
managers affected. Met with personnel  
from PED and discussed impact of  
realignment.

RECOMMENDATION  
ASTORS Function from  
AFRM Div to PPC Div  
  
Realignment of Air-  
frames Shops



APPENDIX C

STEP Recommendations and Status for the 15 Dec 82 In-Process Review

(Briefing Materials)

<u>RECOMMENDATION</u>	<u>ACTION COMPLETED</u>	<u>ACTION PENDING</u>
Assembly Line Movement and Clean-up	All movers have been selected and are on board. Movers have received first phase of training.	Second phase of movers' training which involves safety is forthcoming. Training is scheduled for 20 Dec 82.
Mechanic Certification*	CCAD team made trip to RRAD to observe performance testing and to gather information for CCAD. Trip report was initiated and provided to CPO.	CPO will review trip report. CPO should start actions on the initiation of performance testing at CCAD in Jan 83.
Hardware Carousel	Milestones were provided by PZD and are as follows: Economic Analysis Completed - Jan 83 Economic Analysis Forwarded to DESCOM - Jan 83 Received Funding Approval - Feb 83 Procurement Specification Completed - Apr 83 Obligate Funds - Apr 83	Awaiting representative from crouseel company to further evaluate the Airframe Division for feasibility of Application of Hardware Carousel.
Supervisor/Management Training	LMDC in process, going into 3d week; this training will be completed by all managers in Airframe Division by 15 Jan. All other training is being coordinated and will be on an on-going basis.	OEC&S will assist in developing a training plan for supervisor training.
Streamlining of Aircraft Flow	DF submitted thru Dir, Maint to PED for feasibility study on the recommended changes.	Dir, Maint will discuss this action at IPR, 15 Dec 82.
Reduction of Dead-End Jobs	Plan has been developed and will be forwarded to CPO.	CPO will review plan and furnish information to T&D for coordination with concerned elements.
Work Leader (Maintenance Verifier)	Promotional Bulletins were issued. Register was established for Painters and AWC's. Register for other trades being cancelled.	Upon completion of personnel actions required for selection interviews will be conducted and selection will be made.

RECOMMENDATION

PPC Forecasting Function to Dir, Supply

PPC Pre-Shop Analysis to Dir, QA

AFRM Production Control Function to PPC Div

ASTORS Function from AFRM Div to PPC Div

Realignment of Airframes Shops

ACTION PENDING

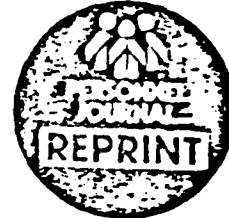
DF to initiate required actions to accomplish the changes has been forwarded to those concerned by Force Development.

Completion of 279's by P6PC Br which should be ready for signature by Monday, 20 Dec 82.

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# ASK ME — A Merit Promotion System

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**Michael L. Johnson**

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**T**he problem of measuring merit has been around for years. Agencies have been challenged since the inception of the Federal Merit Promotion Policy in 1959 to select and promote the best qualified employee.<sup>1</sup> Responsible officials have made speeches and promises and repeated renewed commitments to development of a merit system that achieves the dual objectives of meeting management's staffing needs and providing for each employee the opportunity to compete on an equitable basis.

Achieving the dual objectives is obviously worth the time and effort. If we really had a way to measure necessary skills, we would unfailingly select the superior employee. And if employees believed our procedures of selection were fair and unbiased, there might very well be less turnover, complaints and absenteeism—fewer people problems in general.

The fact is, however, we still have all these prob-

lems and others, sound merit procedures are apparently yet to be developed. Our collective failure to devise a workable merit program that benefits the agency and the employee is evidenced repeatedly in our work force, our agency appeal channels and our courts.<sup>2</sup>

It is very doubtful that agencies willfully fail to select on the basis of merit. The simple fact is that: the measurement of merit is a very complex problem with no easy solutions. We really try our best: we review applications, we interview people, we use a panel of raters and a crediting plan. Yet, still there is something missing. Do we really know we have selected the most skillful and knowledgeable employee? Can we guarantee a supervisor we are sending a truly competent person to the job? In brief, can we prove our selection was valid, or have we just selected that employee who was the best at filling out the application?

The Red River Army Depot in Texarkana employs more than 5,000 people. These problems of selection were and still are of critical importance to the accomplishment of our goals. For many reasons, we sorely needed to establish a system of selection that provided skilled employees and ensured unbiased competitive selection. In our early efforts, we were influenced by the thoughts of two managers: Nicholas Oganovich, ex-Director of the U.S. Civil Service Commission, and Robert Townsend, ex-Avis and American Express Chief.

Oganovich, in 1965,<sup>3</sup> stated succinctly the core of a successful merit program.

*... This time we have to make certain that employees get the word. Acceptance and support of the program your agency devises depend for their very existence on how well employees understand what the program is, why you have it, and what it is going to do for them individually. Not collectively, not in general—but individually.*

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## After assessing 1,200 employees by this method, not one grievance or EEO complaint was received.

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Townsend, an extremely productive manager, has stated in his book *Up the Organization*<sup>4</sup> and in a film of the same title:

*Don't ask management consultants to solve organizational problems. Ask your people—the people on the production line. They know . . . they can help.*<sup>5</sup>

Two excellent recommendations: use your people and involve them individually, not collectively. With these factors in mind, we developed at Red River a procedure that we believe measures merit. Our managers like it, our employees support it, and many people with a personal interest had a hand in its development. We have assessed 1,200 people by this method and have not received one grievance, EEO complaint or congressional. We call the system ASK ME.

The acronym ASK ME stands for Ability, Skill and Knowledge Merit Evaluation. ASK ME consists of these four basic steps: job analysis, examination plan, evaluation, and validation:

### Phase I—Job analysis

Our procedure begins with a detailed job analysis by subject matter experts (SMEs)—describing to a personnel technician what knowledge, skills and abilities (KSAs) are necessary to identify a superior worker in a particular job.

### Phase II—Examination plan

The second phase consists of developing an examination plan, or how to measure necessary KSAs.

### Phase III—Candidate evaluation

Following development of the examination plan, applicants are evaluated using appropriate measuring

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devices. A candidate's degree of skill may be assessed by several methods: performance evaluation, oral evaluation, education, training, supervisory appraisal, etc. After assessment by these methods, those candidates with the highest composite scores are considered best qualified and selections are made accordingly.

### Phase IV—Validation

A final critical phase of ASK ME is validation of the system: Does it do what it purports to do? Will this system really give us the best qualified employee? Content, face, and criterion-related validity are all employed in the validation effort.

### The Method in Detail

#### Phase I—Job analysis

To illustrate how ASK ME applies to a particular position, a mechanic's job can be used to detail specifics

The first step is to choose the subject matter experts, or SMEs. Six are named and, of the six, two are supervisors, two are leaders and the remaining two journeyman mechanics. (Composition of the panel generally includes at least one female, one minority and one union representative.) Consideration is given not only to the technical skills of these individuals, but also to their fairness of attitude and absence of marked prejudices.

In the initial meeting with the personnel technician, the SMEs are told the purpose of the job analysis process and the manner in which it should be carried out. The personnel technician is of critical importance in clarifying the purpose and assuring common understanding of terminology to be used.

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### *The job analysis designates superior worker characteristics.*

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The first phase of the actual job analysis session is the listing of all job elements SMEs consider necessary for superior performance, in this case approximately 160. The SMEs are then asked to rate each of the elements, using the job element blank devised by Ernest S. Primoff.\* (Prior to this step, SMEs are required to make some practice ratings to prove or learn familiarity with category headings and scoring procedure.) The rating sheets are then evaluated by a computer program developed by the Civil Service Commission and modified for our particular needs at Red River. The output of the program identifies the major elements of the job and also subelements. Several other key indicators are also generated by the program: the print-out, based on SME ratings of particular elements, points out redundant items and areas where training is needed. In addition, the program designates superior worker characteristics.

From the computer output, SMEs review each element on a single card for easy reference. The experts then consolidate any major elements possible, eliminate redundant items, and place subelements under appropriate major element headings. This completes our job analysis procedure. We now have a list of the essential elements that are necessary for superior performance.

### *Phase II—Examination plan*

Our next step is to devise an examination plan detailing how we intend to measure those essential elements. The SMEs in the case of the mechanic's post are asked to take each subelement and select the best measuring device for it. The list of possible measuring devices includes: 1) performance evaluation, 2) oral evaluation, 3) education, training, self-development, awards, and 4) personal qualifications statement (including self-ratings).

In the mechanic's post example, the subelement "ability to use a micrometer" would obviously be best measured by the performance evaluation method. For a more subjective subelement, such as reliability or dependability, the supervisory appraisal is the logical meas-

uring device. Returning to the first subelement, "ability to use a micrometer," we see the particular strength of ASK ME. Prior to this system, how could we really rate such a skill? We could ask the supervisor, who might give a fair estimate of the candidate's abilities, or who might be unjustly critical. Conversely, the supervisor might lie for the employee due to the halo effect. On the other hand, if we asked the employee to rate his or her skills with measuring instruments, it would be hard to tell if the person was being truthful or perhaps too modest, thus reducing chances for promotion. In other words, all these methods are subjective, but with ASK ME, we see the person exhibit skills (or fail to) with a measuring instrument. The same is true if the requirement is laying a crankshaft, welding or whatever: a more objective measure of a certain skill is provided. Naturally, personnel technicians are not familiar with how to perform these functions, but SMEs are, and therefore they do the actual scoring on performance and oral evaluation.

After determining which measuring device will be used for each element, the elements are equally weighted and the examination plan is completed.

### *Phase III—Candidate evaluation*

Actual assessment of the candidates begins. In the mechanic's example, all of the measuring devices are used to measure KSAs. The personal qualifications statement is used, for example, to measure self-ratings. On a form, applicants are asked to rate their own ability on certain elements. The rating ranges from "A" which means the applicant has little or no knowledge of the element, to "E" which means the applicant considers himself or herself an expert. In many instances, this self-rating varies considerably with what was actually demonstrated in the oral or performance evaluation.

Elements best measured by oral evaluation constitute another measuring device in the mechanic's position. Three technically qualified raters ask each applicant 35 questions, which are accompanied by slides to further clarify details. This visual-oral approach also serves to reduce any inference of cultural or ethnic bias. Consideration has since been given to playing the questions on a tape recorder to assure that each candidate receives the same instructions.

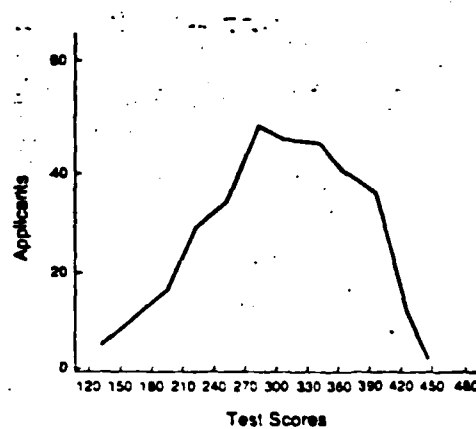
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### *All possible methods are used to measure the employee's ability.*

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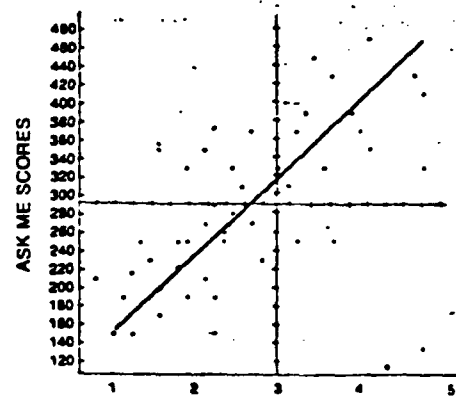
Supervisory appraisal and education training are also used as measuring devices in some areas. Because, however, of the more objective nature of performance evaluations, all elements possible are measured by this method. Fair time allocations for completion of performance tasks are set by observing actual performance of "dry-run" journeyman mechanics and calculating mean time for successful completion. In performance evaluation areas, applicants are required

**Table 1**  
Distribution of Assessment Scores



		PERCENTILES	
N = 430		75th	362 - BD
X = 308		50th	312 - O
Median = 312		25th	261 - I
SD = 72			
Range = 126-461			

**Table 2**  
Results of the Predictive Validation



Supervisory Assessment (representative sample)  
6 months - 1 year  
Job Evaluation

1 - Poor	N = 211
2 - Marginal	r = 0.625
3 - Average	
4 - Above Average	
5 - Superior	

to perform such functions as "mic" the crankshaft for a jeep and select correct bearings, then install bearings in crankshaft and torque cap bolts in accordance with the technical manual. Some applicants might install the crankshaft backwards, while others try to "mic" bearings with a ruler. Conversely, our raters can see clearly when a person truly possesses mechanical aptitude. As mentioned before, the candidates with highest composite scores are considered best qualified and selected for vacancies. Two of the top scorers, incidentally, for one mechanic's job were recent high school graduates with less than 1 year's experience as a mechanic's helper at the depot. The only other experience they had was personal—working on their own cars, etc.

A short note about those individuals who are not selected. Since the whole procedure clearly delineates what skills are necessary, it is quite simple for any applicant to see in what area he or she needs training. We learned from ASK ME that management was deficient in providing training in the trades and crafts area. Arrangements were made with the local community college to provide vocational training after hours on internal combustion, electrical systems, blueprint reading, welding, fuel systems, and others. This training is offered at a reduced cost to employees utilizing depot facilities, tools and equipment. Employees pursuing this curriculum should eventually be well qualified for advancement in the mechanic field. We refer to this training program as "the other side of ASK ME."

#### Phase IV—Validation

Our next step is to prove our test predicts successful job performance accurately. Several types of validity are used to satisfy this requirement. Our procedure involves content and criterion-related validity; while the nature of the exam plan results in obvious face validity.

For example, after some 430 candidates for mechanic posts received their ASK ME scores, the data was reviewed for purposes of determining qualification categories. The scores ranged from 126-461 with a mean score of 308 and SD of 72. Reviewing applicants' scores as a total group showed percentiles to be stable. Percentiles were as follows:

75th — 362
50th — 312
25th — 261

Those individuals scoring 312 or above (50% of all applicants assessed) were considered qualified. A distribution of assessment scores is provided in Table 1.

Content validity is defined by the Civil Service Commission, Anastasia<sup>8</sup> and Nunnally<sup>9</sup> as depending primarily on the adequacy with which a specific group of behaviors is sampled. In other words, one should ensure validity by the plan and procedures used in constructing any assessment device. We feel our system

Continued on page 46

## ASK ME—A Merit Promotion System

Continued from page 433

has more than adequate content validity due to the fact that only those elements considered essential by job knowledge experts are used as test items. The degree of content validity is further strengthened by our use of all essential elements rather than a representative number. What better measurement of a mechanic's KSAs is there than to see him or her "mechanic"?

Another validity measure performed in the case of the mechanic openings was predictive validity. Predictive validity is of value when we are attempting to use any instrument to estimate some form of future behavior, such as successful job performance as a mechanic. This future behavior is referred to as the criterion. The procedure consists of correlating scores on the predictor test with ratings of employees' actual job performance after a six-month to one-year observation period. The size of the correlation (referred to as a validity coefficient) is a direct indication of the amount of predictive strength the instrument possesses. What is a sufficient validity coefficient? Robert N. McMurry in *Tested Techniques of Personnel Selection* states:

*... If the correlation between the test scores and criteria of job success is high (at least .50) the test is said to be "valid," and can be used with confidence in predicting the success of applicants.<sup>14</sup>*

With these guidelines, we asked supervisors to rate each of their employees in terms of mechanical skills after a sufficient period of observation. These ratings were converted to numerical values and correlated with ASK ME scores.

A sample of 211 applicants' scores and supervisory ratings were used for concurrent validation in our procedure. The validity coefficient was found to be 0.625 and considered of adequate strength for purposes of prediction. Simply stated, if ASK ME scores predicted good mechanics, supervisor's observations tended to confirm test predictions. Results of the predictive validation are displayed in Table 2.

ASK ME has some obvious strengths. We believe that it does produce a fair and objective method of identifying skilled employees. The system is flexible, adaptable to almost any position, and we are currently beginning to explore other job areas.

There are other advantages, not so apparent, but of equal value. Because of ASK ME, supervisors have been made more aware of their responsibility to assure that each employee is required to perform the total job rather than a specific portion of that job. Additionally, employees see clearly that there are avenues of progression that can be accomplished through such self-development as our college training program provides.

Perhaps the best thing of all concerning the system is the fact that we did it together—the work force, the union, managers and everyone. Our people believe in and accept the ASK ME system because they helped ensure that it truly and simply measures merit, and we believe it does, too. ■

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## DEAD-END JOB PLAN

1. Position and Pay Classification Branch will compile a list of TDA positions, to include job title/series, and forward to the applicable work center supervisor.
2. Through coordination with supervisors, Training and Development will develop a list of anticipated vacancies for the next five years. The list will contain location, brief description of working conditions, job duties, and career promotion potential. This list will be provided to all supervisors.
3. Supervisors, of employees in dead-end jobs, will develop an Individual Development Plan (IDP) for each employee. The names of those employees who will be considered for lateral/downgrade will be furnished to Recruitment and Placement Branch, along with a copy of their IDP which will include their 1st, 2d, and 3d choice of positions/career paths. IDP counseling will include considerations of management needs, careerist's desires, and explanation of possible career paths which may require coordination with Recruitment and Placement Branch.
4. Upon receipt of the above, Recruitment and Placement will compile a list of all dead-end job incumbents by SDC/EOD. A second list will be compiled of those incumbents who meet the minimum qualifications for their 1st choice, the 2d and 3d choice will also be annotated as to minimum qualifications met or not met. This list will be updated as incumbent becomes minimally qualified. A list of 10 names will be provided to supervisor who has vacancy.
5. The supervisor will consider the candidates, on the above list, for lateral/downgrade and make a selection if desirable. Written justification for non-selection must be forwarded to dead-end job program committee. If justification is proper, Recruitment and Placement Branch will receive approval to forward merit promotion referral list to selecting official.
6. Recommend the Commander appoint a dead-end job program committee which will consist of at least one representative from Airframe Shops Division, Civilian Personnel Office, Directorate for Resources Management, Internal Review and Audit Compliance Division, and Production Planning and Control Division. This committee will have the purpose of monitoring and evaluating the dead-end job program and insure effective compliance. The committee will give IPR's at the monthly R&A meetings.



## KEY VARIANCES TO BE USED AS STEP (QPR) EVALUATIONS

### #35 - TIME TO PROCESS STRUCTURES

Information is available on a monthly report of manhours and flow time on airframes processed out of Hangar 43. FY 82 history is available for comparison.

Measurements: A. Actual manhours versus estimated  
B. Total time (days to process)

### #49 - TIME TO ASSEMBLE

Information is available on RIN:M03RJ30014G aircraft location analysis for airframe Division. FY 82 history is available for comparison.

Measurement: Time to process UH-1H from Station #7 thru #14

### #50 - COMPLETENESS OF KITTING

Information available on RIN:M03RJ30184D aircraft work-in-process master file recap. FY 82 history available for comparison.

Measurement: Average number of complete kits issued monthly

### #55 - QUALITY OF FINISHED ASSEMBLY (FUELING PROCESS)

Information is not being retained. DF requesting this information is in draft. No information is available for FY 82 comparison.

Measurement: Manhours expended due to rework

### #57 - TIME TO PAINT

Information is available on Work Center Detail Performance Report. FY 82 history is available for comparison.

Measurement: Manhours expended to paint UH-1H aircraft

### #67 - TIME TO CERTIFY ( FINAL INSPECTION ASSEMBLY LINE)

Information is available on quality records. FY 82 history is available for comparison.

Measurement: Actual manhours expended to perform final inspection on UH-1H in station #14

## LESSONS LEARNED

1. STEP Design Groups should always go through an LMDC immediately after being selected. The course should be tailored to their specific needs, and the Depot Program Manager for STEP should attend the course with the Group.
2. The selection process for Design Group members should be handled by a committee, made up of supportive managers appointed by the Commander. The selections should be made from a list of volunteers, with input from concerned supervisors. Final selections should reflect a good cross section of trades/experience in the area to be studied.
3. Sufficient time should be devoted to insuring that depot management thoroughly understands the STEP process, and its underlying objectives, before beginning the study.
4. The process should not be compressed into a tighter schedule than twelve months. Each phase of the process should have sufficient time allotted to it for achieving maximum results.
5. The SDG should always work to a philosophy of "no surprises". Constant communication must be maintained with management, unions and the workforce.
6. The SDG needs a leader in order to achieve maximum results in a limited time frame. This leader can be a member of the group or the Program Manager; but the need to recognize someone as a Group Leader must be understood and accepted by all members.
7. The SDG must develop, and abide by, a Daily Agenda to avoid straying away from their objectives.
8. Management must be committed to the Program. Without commitment from the Commander, there is no point in even considering a STEP analysis. Management commitment below the Commander is almost equally important.
9. The SDG should limit the size of the groups that it talks to at any given time. When groups are too large it is difficult to maintain control and get anything accomplished.
10. Implementation dates for approved recommendations should be realistic and attainable. Slipping suspense dates is detrimental to success; and having to be driven by unnecessarily restrictive implementation dates is equally detrimental.
11. A Depot Philosophy Statement should be developed by high level managers and the STEP Design Group. Its implications should be understood and accepted by all levels of management and the workforce.
12. The SDG should maintain an "Open Door" policy with the management, the unions and the workforce, to the fullest extent possible.

13. Negative attitudes should be dealt with immediately in a positive manner.
14. SDG members should be permanently detailed, rather than meeting on a part-time basis.
15. The SDG should have regularly scheduled, weekly group process sessions; and should establish, and abide by, groundrules.
16. The SDG should utilize subject matter experts to the maximum extent possible during the development of recommendations.
17. The SDG should insure that they stick to their defined boundaries in accomplishing the analysis.
18. Training and information sharing should be designed for diffusing the STEP process to other areas of the Depot and other DESCOM depots.
19. Topics to be addressed by SDG should be screened to insure that they do not become sidetracked by relatively unimportant issues.
20. The Variance Matrix should be widely utilized as a communication device.
21. The union should be actively encouraged to participate in the STEP program.

## APPENDIX D

### STEP Design Group Accomplishments

The following accomplishments are over and above those reflected in the actions on the STEP recommendations shown in Appendix C. They are adapted from written and verbal communications with Ms. Sandra Strub and other SDG members. During the six to seven weeks prior to the IPR, the accomplishments include:

1. An SDG member trained the new aircraft movers.
2. Three SDG members went to Red River Army Depot to study their performance testing program and prepared detailed trip reports.
3. There were numerous meetings between the SDG and Production Engineering personnel concerning the hardware carousel.
4. The SDG designed the class make-up for five LMDC courses and coordinated this with Directorate of Maintenance
5. In coordination with the OE Consultant, the SDG designed the cascading training model for role identification.
6. The SDG participated in numerous meetings with POCs from the Directorates of Maintenance, Supply and Quality Control to design the technical training for Production Controllers, Material Expeditors, and Maintenance Verifiers.
7. The SDG developed a plan to reduce dead-end jobs.
8. The SDG spent much time gathering data and defusing hostilities raised in the initial selection of Maintenance Verifiers. A summary sheet was prepared to recommend a remedy to the selection process.
9. There were numerous attempts to meet with forecasters to allay their fears and concerns about the reorganization.

APPENDIX E

Productivity and Quality of Working Life Measures  
(based on 9 July 1982 meeting with CCAD Commander and Staff)

The following measures are to be measured at the work center level (if available):

Performance

1. Ratio of number of manhours per unit (UH-1H) to PSA standards (footnote condition and age of aircraft)
2. Number of manhours spent on special projects at Depot (e.g., El Salvador helicopters)
3. Number of people and hours spent on TDY on special projects
4. Quality -- number of rework manhours per helicopter
5. Changes in equipment and new equipment installation

\* \* \* \* \*

The following measures are to be measured at the organizational level, i.e., for the depot as a whole.

Quantity

1. Number of work days per month to produce one Huey from arrival to customer delivery

Quality

1. Internal:
  - a. Number of defects per aircraft at flight test
  - b. Type of defect
    1. critical
    2. major
    3. minor
2. External:
  - a. Number of customer complaints
    1. at delivery
    2. later - after delivery

\* \* \* \* \*

A P P E N D I X F  
SUPERVISOR AND EMPLOYEE SURVEYS  
(Reduced Copy)

**CORPUS CHRISTI ARMY DEPOT  
SUPERVISOR SURVEY**

THIS IS TO BE KEPT IN CONFIDENCE  
AND NOT TO BE DISCLOSED TO ANY OTHER  
PERSONS EXCEPT THE PERSONNEL OF THE  
TECHNICAL TRAINING AND RESEARCH CENTER  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES  
OFFICE OF THE DEPARTMENT OF THE ARMY

PT 5503b  
(ATTN: MCB-MA-82-408)

<p align="center"><b>DATA REQUIRED BY THE PRIVACY ACT OF 1974</b> (5 U.S.C. 552a)</p>	
<p><b>1 TITLE OF FORM</b> Corpus Christi Army Depot Supervisor Questionnaire</p>	<p><b>2 PRESCRIBING DIRECTIVE</b> AR 70-1</p>
<p><b>3 AUTHORITY</b></p>	
<p><b>4 FEDERAL AGENCY</b> 10 USC Sec 4303</p>	
<p><b>5 PURPOSE AND USES</b></p> <p>The data collected with the attached form are to be used for research purposes only.</p>	
<p><b>6 ROUTINE USES</b></p> <p>This is an experimental personnel data collection form developed by the U.S. Army Research Institute for the Behavioral and Social Sciences pursuant to its research mission as prescribed in AR 70-1. When identifiers (name or social security number) are requested they are to be used for administrative and statistical control purposes only. Full confidentiality of the responses will be maintained in the processing of these data.</p>	
<p><b>7 MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION</b></p> <p>Your participation in this research is strictly voluntary. Individuals are encouraged to provide complete and accurate information in the interests of the research, but there will be no effect on individuals for not providing all or any part of the information. This notice may be detached from the rest of the form and retained by the individual if so desired.</p>	
<p align="right">FORM Privacy Act Statement: 28 Sep 76 DA Form 4308-9, 1 May 76</p>	

December 1982

**CORPUS CHRISTI ARMY DEPOT SUPERVISOR SURVEY**

This survey asks about characteristics of your work center. Your answers will provide the information needed to understand better how your work center is constructed and the nature of the work you do. It will also provide a basis for understanding how changes which occurred at CCAD during STEP (Sociotechnical Systems Evaluation Program) affected your work center.

Your answers to these questions are completely confidential. We do not need your name or social security number. All surveys will be taken to the U.S. Army Research Institute for the Behavioral and Social Sciences in Washington, D.C., for analysis and safekeeping. No one at CCAD will ever have access to individual surveys.

All questions should be answered directly on the questionnaire in the space provided.

Thank you for your cooperation and assistance.

U.S. ARMY RESEARCH INSTITUTE  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

**GENERAL INSTRUCTIONS**

Most of the questions ask that you fill in the blank which appears to the right of the item. Please determine your best answer to the question and write it in the blank.

Example:

How many employees are there in your work center? 25

A few questions ask that you circle one response among several possible responses. For each question circle the number which corresponds to your answer. Example:

I enjoy the weather in this area.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

All questions should be answered directly on the questionnaire.

.....



OFFICE USE ONLY	OFFICE USE ONLY
1. What is your work center title? _____	1:33, 34
2. What is the identification number of your work center? _____	1:35, 36
3. What is the main activity of your work center? _____	1:37, 38, 39
4. An supervisor of your work center, to whom do you report? (Please give <u>title</u> of person only.) _____	1:40, 41, 42
5. How many distinct job titles are there in your work unit? _____	1:43, 44
6. What is the grade of the lowest paid person in your work center? (Report only for full-time employees.) _____	1:45, 46
7. What is the grade of the highest paid person (including yourself) in your work center? (Report only for full-time employees.) _____	1:47, 48
8. How many full-time employees in your work center have only "direct" labor responsibilities for work on unit output (i.e., they have <u>no</u> "indirect" labor responsibilities)? _____	1:49, 50
9. How many different grade levels are there in your work center, including the lowest and highest grades? _____	1:51, 52
10. How many administrative levels are there, from your position as that of the commander of the depot, including your position and the commander's? _____	1:53, 54
11. How many full-time employees in your work unit have only "indirect" labor responsibilities for work on unit output (i.e., they have <u>no</u> "direct" labor responsibilities)? _____	1:55, 56
12. How many full-time employees in your work unit have both "indirect" and "direct" labor responsibilities for work on unit output? _____	1:57, 58
13. Approximately how many person-days of productivity does your work center lose for reasons of illness during an average pay period? _____	
14. Approximately how many person-days of productivity does your work center lose for reasons other than illness or vacation during an average pay period? _____	
15. For each of the following reasons, please estimate the number of person-days of productivity that your work center loses during an average pay period. a. Parts-chasing _____ b. Administrative activities _____ c. Meetings _____ d. Training _____ e. Clean-up _____ f. Other (please specify) _____	
16. How many of your work center employees have left this work center since 1 January 1982 for a job: a. Outside the depot? _____ b. In another work center? _____	

OFFICE  
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1:59, 60

Directions: For each of the following questions please  
circle the number that corresponds to your answer.

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1:61, 62

23. How important are performance records for promoting  
first-line supervisors?

2:43

1:63, 64, 65

24. How important are performance records for promoting  
work center employees (not including the supervisor)?

2:44

1:66, 67, 68

25. To what extent do you perform the same tasks from  
day-to-day?

2:45

2:11, 12, 13, 14

26. How much the same are the day-to-day situations,  
problems, or issues you encounter in performing your  
major tasks?

2:46

17. How many employees have been dismissed from your work center  
since 1 January 1947?

18. How many employees in your work center have retired since  
1 January 1947?

19. In order for an employee in your work center to become fully  
skilled in the main activity of the work center, approxi-  
mately how many hours of training are needed? (Both  
classroom and on-the-job?)

20. Out of the total training time stated in Question 19  
approximately how many are formal classroom hours (e.g.,  
classes inside the depot, classes at a technical school,  
etc.)?

21. Approximately how many hours of training does the average  
worker need before getting a job in your work center?

22. How many workers in your work center fall into each of the  
following categories?

	Full Time	Part Time
a. Foremen	_____	_____
b. Technicians	_____	_____
c. Journeyman mechanics	_____	_____
d. Intermediates	_____	_____
e. Millers	_____	_____
f. Laborers	_____	_____
g. Apprentices	_____	_____
h. Office, clerical and administrative personnel	_____	_____

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27. During a normal week, how frequently do exceptions arise in your work tasks which require very different methods or procedures?

1. Very rarely
2. Occasionally
3. Quite often
4. Very often
5. Constantly

2:47

28. How often do you follow about the same work methods or steps for doing your major tasks from day to day?

1. Very seldom
2. Sometimes
3. About half the time
4. Quite often
5. Very often

2:48

29. How easy is it for you to know whether you do your work tasks correctly?

1. Very difficult
2. Quite difficult
3. Somewhat easy
4. Quite easy
5. Very easy

2:49

30. What percent of the time are you generally sure of what the outcomes of your work efforts will be?

1. 0-20%
2. 21-40%
3. 41-60%
4. 61-80%
5. 81-100%

2:50

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USE  
ONLY

31. In the past 3 months, how often did difficult problems arise in your work for which there were no immediate or apparent solutions?

1. Once a week or less
2. About 2-4 times a week
3. About once a day
4. About 2-4 times a day
5. 5 times or more a day

2:51

32. About how much time did you spend solving these work problems?

1. Less than 1 hour per week
2. About 1-4 hours per week
3. About 1 hour per day
4. About 2-3 hours per day
5. 4 hours or more per day

2:52

EXHIBIT A

Exhibit A presents a classification scheme that attempts to group production machinery according to its level of automation. The information in Exhibit A is necessary in order to answer questions 3) through 35. Please read it thoroughly before answering the questions in this section.

LEVEL 1

POWERED MACHINES AND TOOLS

Machines are replaced for the basic machine function, but machine action and control are completely dependent upon the operator. The machines and tools use mechanical power, but people are required to position work and machine for desired action.

Examples: electric hand drill, belt sander, air hammer.

LEVEL 2

SINGLE-CYCLE AUTOMATIC MACHINES

The machine completes an action when initiated by an operator. An operator is required to set up, load, initiate actions, adjust, and unload.

Examples: pipe-threading machine; radial drill; electroerosion machine; precision boring machine; machine tools such as grinder, planer, mill, shaper, and lathe.

LEVEL 3

AUTOMATIC-REPEAT CYCLE MACHINES

At this level all energy is mechanized. The machine carries out routine instructions without aid of an operator. The machine starts cycle and repeats actions automatically--self-feeding. It loads, goes through sequence of operations, unloads to next station or machine. No self-correction but obeys internal program such as cams, tapes, or cards.

Examples: engine production lines, self-feeding press lines, copying lathe, automatic assembly of switches.

LEVEL 4

SELF-MEASURING AND -ADJUSTING MACHINES

The machines measure and compare results to desired state and adjust to minimize error.

Examples: (a) Feedback from product; automatic sizing grinders, dynamic balancing, color matching or blending, process controllers.

(b) Positional feedback; pattern-tracing flame cutter, feedback control of machine tool table, self-correcting tape control machines.

LEVEL 5

COMPUTER-CONTROLLED MACHINES

The computer monitors multiple factors on which machine or process performance is predicated. It evaluates and reconciles them to determine proper control action.

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Please use Exhibit A to answer questions 33-35.

Because you may have machinery at several levels on the scale we would like you to estimate:

33. The number of production workers operating powered machines (levels 1-5 combined) \_\_\_\_\_

34. The number of production workers using nonpowered machines (e.g., assemblers using pliers, set-up men using wrenches) \_\_\_\_\_

35. Please list the five most important machines used in your work center:

Machine	Machine Level (see Exhibit A)	Number of People Who Use Machine
a. _____	_____	3:15 _____
b. _____	_____	3:18 _____
c. _____	_____	3:21 _____
d. _____	_____	3:24 _____
e. _____	_____	3:27 _____

36. Please estimate the total number of production person-hours per day for all employees in your work center that are devoted to activities other than direct production. (Include your line and that of all full-time employees.)

- a. supervising person-hours \_\_\_\_\_
- b. clerical person-hours \_\_\_\_\_
- c. inspecting person-hours \_\_\_\_\_

37. Approximately how many direct labor person hours does your work center spend each week on the UM-1H helicopter? \_\_\_\_\_

38. Approximately how many indirect labor person hours does your work center spend each week on the UM-1H helicopter? \_\_\_\_\_

3:11, 12

3:13, 14

3:16, 17

3:19, 20

3:22, 23

3:25, 26

3:28, 29

3:30, 31, 32

3:33, 34, 35

3:36, 37, 38

39. Directions: Please examine the list of decisions below and indicate, by circling the appropriate number, the lowest level in the Depot that has the authority to make that type of decision.

	Work center non-supervisory employee							Work center supervisor							Section or branch chief							Division chief							Commander							Agencies/Individuals outside CCAD (e.g., DARCOM, DSCOM, TSARCOM)							OFFICE USE ONLY							
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7								
a. Labor force requirements of work center																																																		3:45
b. Labor force requirements of total Depot																																																		3:46
c. Promotions of nonsupervisory personnel																																																		3:47
d. Promotions of supervisory personnel																																																		3:48
e. Dismissal of nonsupervisory personnel																																																		3:49
f. Dismissal of supervisory personnel																																																		3:50
g. Selection of supervisory personnel																																																		3:51
h. Selection of nonsupervisory personnel																																																		3:52
i. Spending of unbudgeted/unallocated money																																																		3:53
j. Type and/or brand of new equipment																																																		3:54
k. When overtime is to be worked																																																		3:55
l. Delivery dates and priority of orders																																																		3:56
m. What shall be costed																																																		3:57

39. (Continued)

	Work center non-supervisory employee							Work center supervisor							Section or branch chief							Division chief							Commander							Agencies/Individuals outside CCAD (e.g., DARCOM, DSCOM, TSARCOM)							OFFICE USE ONLY														
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7															
n. What shall be inspected																																																									3:58
o. Personnel selection methods to be used																																																									3:59
p. Methods of work to be used, i.e., how a job is to be done																																																		3:60							
q. Determine allocation of work among available workers																																																		3:61							
r. Alter responsibilities/areas of work for employees																																																		3:62							
s. Buying procedures																																																		3:63							
t. Create a new department																																																		3:64							
u. Create a new job/position																																																		3:65							
v. Determine volume of output																																																		3:66							
w. Determine pace of production work (work load in given period of time)																																																		3:67							
x. Major changes in labor force (substantial hirings or layoffs)																																																		3:68							
y. Which suppliers of materials and parts to be used																																																		3:69							
z. Training methods to be used																																																		3:70							

4j. Directions: Please indicate whether the following documents and procedures are used in your work center. Circle the number "1" for "YES" if they are used, and the number "2" for "NO" if they are not.

	YES	NO	OFFICE USE ONLY
a. Manual of standard operating procedures (to guide work activities)	1	2	4:11
b. Booklets about the Depot	1	2	4:12
c. CAD Organizational chart	1	2	4:13
d. Work center organizational chart	1	2	4:14
e. Regular production and work schedules	1	2	4:15
f. Job recruitment procedures	1	2	4:16
g. Written job descriptions	1	2	4:17
h. Statistical performance records	1	2	4:18
i. Formal wage and/or salary review procedure	1	2	4:19
j. Formal job evaluation procedure	1	2	4:20
k. Formal promotion procedure	1	2	4:21
l. Formal disciplinary procedures	1	2	4:22
m. Written documents that specify offenses	1	2	4:23
n. Written documents that specify penalties for rule violations	1	2	4:24
o. Written documents that specify procedures to acquire job-related training	1	2	4:25
p. Formal procedure for dismissal of employees for disciplinary reasons	1	2	4:26
q. Formal requirements for employees to prepare regular written reports on their work	1	2	4:27

4i. Directions: The categories below describe different types of production. Please estimate in the blank provided the percent of total production in your work center accounted for by each. The percentages for the entire list should add up to 100. If a production type in the list is not used in your work center, please indicate by placing a zero in the blank.

	OFFICE USE ONLY
1. Simple units - basically single pieces, not assemblies, produced one by one (e.g., fuel pumps, hydraulic pumps).	4:28, 29, 30
2. Complex units - assemblies produced one by one (e.g., engines, transmissions, main rotor).	4:31, 32, 33
3. Fabrication - different work people come to the unit of output (which moves infrequently) instead of the unit moving to different work people (e.g., engine decks, castings, doublers).	4:34, 35, 36
4. Small batches - the equipment is reset periodically for outputs measured in items (e.g., supports, brackets, springs).	4:37, 38, 39
5. Large batches - the equipment is reset at intervals of longer than a week for outputs measured in items, BUT the items are assembled diversely, i.e., a variety of assembly sequences, including assembly by complex unit or small batch methods (e.g., MMO kits).	4:40, 41, 42
6. Large batches with large batch assembly - the equipment is reset at intervals of longer than a week for outputs measured in items, and the assembly is by large batch methods (e.g., MMO kits with aircraft systems).	4:43, 44, 45
7. Mass production - where batch size, measured in items, is indefinite, i.e., a change of batch requires a decision in design modification, or retooling, which is beyond the normal authority of the line production management (e.g., supports, brackets, springs).	4:46, 47, 48
8. Process production but combined with mass or large batch outputs (e.g., fabrication, layout).	4:49, 50, 51
9. Process production, but ingredients (i.e., recipes) of throughput change (e.g., small parts, GCA, hydraulic shops).	4:52, 53, 54
10. Process production with continuous flow of constant ingredients - recipe changes are beyond normal authority of line production management and production planning (e.g., cleaning, treating, painting).	4:55, 56, 57

**CORPUS CHRISTI ARMY DEPOT  
EMPLOYEE SURVEY**

It is the intent of the Army to use this survey to obtain information on the morale and satisfaction of the personnel of the Army. The information obtained from this survey will be used for the purpose of improving the morale and satisfaction of the personnel of the Army. The information obtained from this survey will be used for the purpose of improving the morale and satisfaction of the personnel of the Army.

**TECHNICAL DIRECTORATE RESEARCH INSTITUTE  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL  
DEPARTMENT OF THE ARMY**

PT 5503e  
(ATTN: MCB-MA-B2-60A)



<b>DATA REQUIRED BY THE PRIVACY ACT OF 1974</b>	
<b>1. OVERVIEW</b> Corpus Christi Army Depot Employee Survey	<b>2. AUTHORITY</b> AR 70-1
<b>3. PURPOSE</b> 10 USC Sec 4903 The data collected with the attached form are to be used for research purposes only.	
<b>4. ROUTINE USES</b> This is an experimental personnel data collection form developed by the U.S. Army Research Institute for the Behavioral and Social Sciences pursuant to its research mission as prescribed in AR 70-1. When identifiers (name or social security number) are requested they are to be used for administrative and statistical control purposes only. Full confidentiality of the responses will be maintained in the processing of these data.	
<b>5. DISPOSITION OF INFORMATION</b> Your participation in this research is strictly voluntary. Individuals are encouraged to provide complete and accurate information in the interests of the research, but there will be no effect on individuals for not providing all or any part of the information. This notice may be detached from the rest of the form and retained by the individual if so desired.	

FORM 100-1 Privacy Act Statement, 28 Sep 76  
DA Form 4388-R, 1 May 76

December 1982

**COMPUS CHRISTI ARMY DEPOT EMPLOYEE SURVEY**

This survey is designed to find out how you and others feel about CCAD as a place to work. Your answers will provide the information needed to understand better how people feel about the quality and nature of working life at CCAD. This survey will also provide a basis for understanding the changes which occur here during STEP (Sociotechnical Systems Evaluation Program).

If this survey is to be useful, it is very important that you answer each question frankly and honestly. There are no right or wrong answers to these questions, since we are interested in what you think and feel about your life at CCAD.

Your answers to these questions are completely confidential. All surveys will be taken to the U.S. Army Research Institute for the Behavioral and Social Sciences in Washington, D.C., for analysis and safekeeping. All answers to this survey are completely confidential. The completed questionnaires will be processed by computer and the results summarized in statistical form. Your individual responses will remain strictly confidential since they will be combined with those of many other people. Any background information that you list will be used to sort people into large groups and will not be used to identify you personally.

Thank you for your cooperation and assistance. We hope you find the survey interesting.

**U.S. ARMY RESEARCH INSTITUTE  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES**

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**GENERAL INSTRUCTIONS**

Most of the questions ask that you circle one of several numbers that appear on a scale either to the right of the item or below the item. You are to choose one number that best matches the description of how you feel about the item, and circle that number.

Example:

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I enjoy the weather in this area.	1	2	3	4	5

The same procedure is to be followed if the responses are below the item. Circle the number that best matches the description of how you feel about the item, like this:

How satisfied are you with the weather?

1. Very dissatisfied
2. Dissatisfied
3. Neither dissatisfied nor satisfied
4. Satisfied
5. Very satisfied

All questions should be answered directly on the questionnaire.

.....

	OFFICE USE ONLY					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	
1. I have to check with the boss before I do almost anything.	1	2	3	4	5	1:7
2. The organization stresses following the established procedures.	1	2	3	4	5	1:8
3. All in all, I am satisfied with my work center.	1	2	3	4	5	1:9
4. People working here usually find their jobs monotonous.	1	2	3	4	5	1:10
5. Only persons in management positions can decide how a job should be done.	1	2	3	4	5	1:11
6. There really are no specific rules in this work center.	1	2	3	4	5	1:12
7. Most jobs in this work center involve a variety of different kinds of activities.	1	2	3	4	5	1:13
8. The people in this work center understand how they should act.	1	2	3	4	5	1:14
9. I feel that I can act as my own boss in most matters.	1	2	3	4	5	1:15
10. It seems as though there is a rule for everything here.	1	2	3	4	5	1:16
11. Nothing is said if you come to work late occasionally.	1	2	3	4	5	1:17
12. Even small matters have to be referred to some higher-up for a final answer.	1	2	3	4	5	1:18
13. There can be little action until a supervisor approves a decision.	1	2	3	4	5	1:19
14. My job is so simple that virtually anybody could handle it with little or no initial training.	1	2	3	4	5	1:20
15. My work center has a manual of rules and regulations to be followed.	1	2	3	4	5	1:21
16. At times, going through the proper channels becomes more important than getting the work done.	1	2	3	4	5	1:22
17. Standard procedures are to be followed in almost all situations.	1	2	3	4	5	1:23
18. Around here it's not important how much you know, it's whom you know that really counts.	1	2	3	4	5	1:24
19. All in all, I am satisfied with my supervisor.	1	2	3	4	5	1:25
20. I am encouraged to "cut red tape" in order to get the job done.	1	2	3	4	5	1:26
21. I get work orders from the same person all the time.	1	2	3	4	5	1:27
22. I feel that I am constantly being watched to see that I obey all the rules.	1	2	3	4	5	1:28
23. I make my own rules on the job.	1	2	3	4	5	1:29
24. On my job, I produce a whole product or perform a complete service.	1	2	3	4	5	1:30
25. I can make my own decisions without checking with anyone else.	1	2	3	4	5	1:31
26. My job gives me a chance to try out ideas of my own.	1	2	3	4	5	1:32
27. Most jobs in this work center have something different happening from day to day.	1	2	3	4	5	1:33

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	OFFICE USE ONLY
28. I feel that most of the things I do on my job are meaningless.	1	2	3	4	5	1:34
29. I often do things in my work that I wouldn't do if it were up to me.	1	2	3	4	5	1:35
30. I am expected to follow orders without questioning them.	1	2	3	4	5	1:36
31. The work I do on my job makes a visible impact on a service or a product.	1	2	3	4	5	1:37
32. Red tape is often a problem in getting a job done.	1	2	3	4	5	1:38
33. People who like to make their own decisions would become discouraged here.	1	2	3	4	5	1:35
34. I am not allowed to leave my working area without permission.	1	2	3	4	5	1:40
35. I have enough freedom to do my job as I see fit.	1	2	3	4	5	1:41
36. In this work center there is something new and different to do almost every day.	1	2	3	4	5	1:42
37. Everyone here has one superior to whom he or she reports regularly.	1	2	3	4	5	1:43
38. I usually work under the same circumstances from day to day.	1	2	3	4	5	1:44
39. How things are done around here is left pretty much up to the persons doing the work.	1	2	3	4	5	1:45
40. All in all, I am satisfied with my present job.	1	2	3	4	5	1:46
41. Going through the proper channels at all times is constantly stressed.	1	2	3	4	5	1:47
	1	2	3	4	5	
	1	2	3	4	5	
42. I am left to my own judgment as to how to handle most problems.	1	2	3	4	5	1:48
43. Each person in my work center has a specific job to do.	1	2	3	4	5	1:49
44. Most of us are encouraged to use our own judgment in handling everyday situations.	1	2	3	4	5	1:50
45. No two days are ever the same in this job.	1	2	3	4	5	1:51
46. All in all, I am satisfied with the people in my work center.	1	2	3	4	5	1:52
47. I can get supplies without clearing it with my superior.	1	2	3	4	5	1:53
48. Any decision I make has to have the boss's approval.	1	2	3	4	5	1:54
49. I am constantly being checked up on for rule violations.	1	2	3	4	5	1:55
50. This work center has a complex division of labor.	1	2	3	4	5	1:56
51. Whenever I have a problem on the job I am supposed to go to the same person for an answer.	1	2	3	4	5	1:57
52. My job is essential to the success of the plant.	1	2	3	4	5	1:58
53. My job allows me to control my own work pace.	1	2	3	4	5	1:59
54. Everyone in this work center has a specific function which he or she has to perform.	1	2	3	4	5	1:60
55. I feel pushed on the job.	1	2	3	4	5	1:61
56. I have to follow strict operating procedures at all times.	1	2	3	4	5	1:62

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	OFFICE USE ONLY
57. One thing people like around here is the variety of work they get to do.	1	2	3	4	5	1:63
58. I heard about STEP (Socio-technical Systems Evaluation Program) before today.	1	2	3	4	5	1:64
59. I understand what STEP is.	1	2	3	4	5	1:65
60. In the last six months, morale in my work center has improved.	1	2	3	4	5	1:66
61. In the last six months, productivity in my work center has increased.	1	2	3	4	5	1:67
62. I would expect productivity in my work center to increase due to STEP.	1	2	3	4	5	1:68
63. I would expect morale in my work center to improve due to STEP.	1	2	3	4	5	1:69

Directions: For each of the following questions please circle the number that corresponds to your answer.

64. What is your evaluation of the overall productivity of your work center?
1. Not productive
  2. Slightly productive
  3. Productive
  4. Very productive
  5. Extremely productive
65. What is your evaluation of the overall morale of your work center?
1. Very low morale
  2. Low morale
  3. Fair morale
  4. High morale
  5. Very high morale
66. To what extent do you perform the same tasks from day to day?
1. Almost all my tasks are the same day-to-day.
  2. Many of my tasks are the same day-to-day.
  3. About half my tasks are the same day-to-day.
  4. Some of my tasks are the same day-to-day.
  5. Almost no tasks are the same day-to-day.
67. How much the same are the day-to-day situations, problems, or issues you encounter in performing your major tasks?
1. Very much the same
  2. Mostly the same
  3. Quite a bit different
  4. Very much different
  5. Completely different
68. During a normal week, how frequently do exceptions arise in your work tasks which require very different methods or procedures for doing it?
1. Very rarely
  2. Occasionally
  3. Quite often
  4. Very often
  5. Constantly

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2:12

69. How often do you follow about the same work methods or steps for doing your major tasks from day to day?

1. Very seldom
2. Sometimes
3. About half the time
4. Quite often
5. Very often

70. How easy is it for you to know whether you do your work tasks correctly?

1. Very difficult
2. Quite difficult
3. Somewhat easy
4. Quite easy
5. Very easy

71. What percent of the time are you generally sure of what the outcomes of your work efforts will be?

1. 0-20%
2. 21-40%
3. 41-60%
4. 61-80%
5. 81-100%

72. In the past 3 months, how often did difficult problems arise in your work for which there were no immediate or apparent solutions?

1. Once a week or less
2. About 2-4 times a week
3. About once a day
4. About 2-4 times a day
5. 5 times or more a day

73. About how much time did you spend solving these work problems?

1. Less than 1 hour per week
2. About 1-4 hours per week
3. About 1 hour per day
4. About 2-3 hours per day
5. 4 hours or more per day

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2:17

74. What is your sex?

1. Male
2. Female

2:18

75. How long have you been at this Depot?

1. Less than 1 year
2. 1-5 years
3. 6-10 years
4. 11-15 years
5. 16-20 years
6. More than 20 years

2:19

76. How long have you been in your Work Center?

1. Less than 1 year
2. 1-5 years
3. 6-10 years
4. 11-15 years
5. 16-20 years
6. More than 20 years

2:20, 21

77. How old were you on your last birthday?

\_\_\_\_\_ years old

2:22

78. What is your career field?

1. Aircraft Mechanic
2. Sheet Metal Mechanic
3. Engineering Technician
4. Clerical
5. Inspection
6. Supply
7. Administration
8. Production Control
9. Other (please specify)

2:23, 24

79. What is your pay-grade?

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. 11
12. 12 or above

2:25

80. What is your civilian wage classification?

1. GS
2. MC
3. WL
4. WS
5. Other

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81. Which of the following best describes your career intentions at the present time?

2:26

1. I will definitely stay until retirement
2. I will probably stay until retirement
3. Undecided
4. I will stay for now but will probably leave before retirement
5. I will definitely leave at the earliest opportunity

82. What is your education level (indicate highest level completed)?

2:27

1. Did not finish high school
2. Graduated from high school or G.E.D.
3. Some college or technical training beyond high school (1-3 years)
4. Graduated from college (B.A., B.S., or other Bachelor's degree)
5. Some graduate school
6. Graduate degree (Master's, Ph.D., M.D., etc.)

83. What is your ethnic background?

2:28

1. Anglo
2. Black
3. Hispanic
4. American Indian
5. Other (please specify) \_\_\_\_\_

84. What is your supervisory status?

2:29

1. I am a supervisor
2. I am not a supervisor

85. What is the name of your work center? \_\_\_\_\_

2:30-32

86. What is the identification number of your work center? \_\_\_\_\_

2:33-37

87. What is your social security number? \_\_\_\_\_

2:38-46

APPENDIX G

ORGANIZATIONAL VARIABLES ASSESSED ON THE  
EMPLOYEE AND SUPERVISOR SURVEYS

<u>Organizational Variables</u>	<u>Employee Survey Questions</u>
Hierarchy of Authority/Centralization (Hall, 1963a,b, 1968; Hage and Aiken, 1967)	1,5,9,12,13,21,25,33,37, 39,47,48
Division of Labor/Specialization (Hall, 1963a,b, 1968)	4,7,27,36,38,43,45,50,57, 54
Presence of rules/Formalization (Hall 1963a,b, 1968; Hage and Aiken, 1967)	6,8,10,11,15,22,23,30,34, 49
Procedural Specifications/Formalization (Hall, 1963a,b, 1968; Hage and Aiken, 1967)	2,16,17,22,32,41,42,44,51, 56
Alienation (Goldthorpe, et at., 1968; Pearlin, 1962; Blauner, 1968; NPRDC; Seeman, 1959)	
a. Powerlessness	18,26,29,35,53,55
B. Meaningfulness	14,24,28,31,52
Technology/Routineness of Work (Hage and Aiken, 1967)	
a. Task variability	66,67,68,69
b. Task difficulty	70,71,72,73
Satisfaction (General Organization Questionnaire)	3,40,46,19
Perceived of impact/knowledge of STEP intervention	58-63
Perceived productivity and morale of work center	64,65
Demographics	74-87



ORGANIZATIONAL VARIABLES ASSESSED ON THE  
EMPLOYEE AND SUPERVISOR SURVEYS

<u>Organizational Variables</u>	<u>Supervisor Survey Questions</u>
Hierarchy of Authority/Centralization	10,39 (A-Z)
Stratification	6,7,9,22
Formalization	40 (A-Q)
Formalistic Impersonality	23,24
Alienation	13,16,17,18
Division of Labor	5
Productivity	14,15,36,37,38
Technology/Automaticity	33,34,35
Technology/Complexity	19,20,21,41 (1-10)
Task Variability	22,26,27,28
Task Difficulty	29,30,31,32
Demographic	1,2,3
Type of work responsibilities	8,11,12

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APPENDIX H

Survey Sampling Plan for the  
DEC 82 Administration

Sampling Plan

Supervisors:

This is not a sample. Rather it is the population of first-line supervisors in the Air Frame Division. Every first-line supervisor of every work center within the Division has been included on the list. The exception is with in the Supply Branch (which is a part of the Air Frame Division) where the organizational configuration is sections rather than work centers. From this Branch, those supervisors chosen to complete the supervisor survey are section chiefs (usually GS 11s or GS 12s) rather than first-line supervisors (usually WS 10).

N=42

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Employees:

N=329 This figure represents a sample of approximately one-third of the employees in the Air Frames Division (at work center level only). Division, Branch, and section levels of employees (who tend to have supervisory, or administrative positions), as well as first-line supervisors of each work center were not included in the population from which the sample was drawn.

Method of selection:

1. One-third of each work center was calculated (e.g. work center=15; one-third=5)
2. Distribution of number of employees by grade was counted:

e.g.	WG 08	5 employees
	WG 05	3 employees
	GS 07	4 employees
	WT 42	2 employees
	WT 43	1 employee
		<u>N=15 employees</u>

3. From the total of 15, 5 (one-third of the work center) were chosen from among all wage and grade levels. A weighted method was used, whereby more were chosen from levels containing more employees, and less chosen from levels containing fewer employees. (e.g. WG 08, 3 were chosen; WT 42, 1 was chosen, etc).
4. After it was decided how many were needed from each level within each work center, names were chosen randomly from a printout containing the names of all members of the Air Frames Division.
5. If the total number of people chosen from a work center was less than 5, due to the small size of the work center, the work center was oversampled to bring the sample of that work center up to at least five.

## APPENDIX I

### PROCEDURES FOR CONDUCTING THE CORPUS CHRISTI ARMY DEPOT SURVEYS

1. Introduction of the ARI researcher by the CCAD Organizational Effectiveness (OE) Officer
2. Introduction of self and ARI
3. Introduction to STEP and purpose of the surveys
4. Points emphasized in the introduction:
  - 1) voluntary nature of participation
  - 2) confidential nature of the survey responses
  - 3) desirability of Soc. Sec. Number for tracking purposes
  - 4) no need to be constrained by survey format
  - 5) opportunity to send message to management
5. Throughout the administration of the surveys, frank and honest answers were encouraged. The confidentiality of responses was stressed. The purpose of the surveys was billed, in part, to be a vehicle for change at CCAD, changes that would be for the benefit of all employees.

APPENDIX J

HANDWRITTEN COMMENTS ON THE CORPUS CHRISTI  
ARMY DEPOT EMPLOYEE SURVEY

1. I would also like to say that the system for promotion at this Depot is not very good. I think there is a lot of discrimination and favoritism when supervisors make final selection. I would like to see the eradication for dead end shops, such as the one I work in.
2. Hangar 43 would be a more pleasant place to work in if we had:
  1. More electrical outlets that worked
  2. More fans that worked (in summer)
  3. Heaters that worked in winter
  4. Doors that were weather stripped to keep out the north wind
  5. Rest rooms with HOT running water to wash dirty hands.
3. I know the Colonel is aware of some of the problems with the apprentice class here at CCAD and is trying to improve it. The more effort that is put into improving this course the better it will be for future apprentice classes and for the Depot.
4. The problem is not the people on the Depot. It is personnel that is stopping the people from doing their job. Let the people have a say in things in the shops that they work for and the job will be done right! Let the people in the shop vote for upper levels in the shop, and the job will get done.
5. I, as an employee, feel that supervisors should take an interest in the work that is performed by each of his employees. By this I mean that a supervisor should give recognition to an employee who performs his work in a well organized manner. By recognition I mean such things as: SSPAs, Outstanding Performance Awards. We as employers are under the impression that all these awards programs have been terminated in our section until we read the monthly paper and we read the names of other employees who get awards. We feel that if awards were issued properly in our work center, our morale would be higher. Employees would really put out 110% to try to get an award or recognition. Employees would go that extra mile just to try to get awarded for their efforts.
6. Referring to the weather. It is not the weather outside, but in this work center. We feel that we need a new building because of exertion in summer, and no air conditioning. We feel we need more air conditioning than any other shop at CCAD.

Question #18. In my work center we have some people who get away with anything, no experience, lazy, file discrimination, and still get promoted.

Question #5. It seems that we have no say here.

Question #12. Some supervisors are not qualified for their position, even top management.

Question #41. Even management doesn't have the answers.

Question #55. Too much is expected of some people. Even if someone else is not doing their job, the Crew Chief gets blamed, and this is not a one man job.

Question #59. Even if I do, nothing will be accomplished.

Question #84. My intentions after I graduate from the apprentice program is to be a supervisor and get this place running the way it should.

We constantly have a parts shortage.

7. We have a great need for better supervisors here at CCAD. WE also need better training and more motivation. We need WG-7 and WG-9 who can teach. The WG-7s and WG-9s who have worked here a while don't care and won't teach new people. The supervisors here at CCAD don't care as long as they are being paid.

There is also a need to break the routine the employees get into. This might be done either through cross-training in other shops or through a complete rotation in shop jobs.

8. Question #46. Some people do not pull 100% when you pull more.

Question #62. Productivity would increase if some of the people get off their ----- and would work. The government is spending money for nothing on some of the people here.

Question #63. I wish I could take a test or have some [chance to show] what I can do to get to the next step. Some people get a step higher even though they do not know.

9. Some of my answers won't mean very much, I have been at [this] Depot 2 weeks.

Daily I see qualified people put into work centers where their experience, skills and knowledges are never used.

I have detected a certain amount of apathy in the tool room. Some of the people working there are very slow and could apparently care less if you got the tools needed to do the job properly. And they always seem to be out of what you need.

With (\*) years experience in aircraft maintenance and quality control, I

do not intend to stay in the work center I am in any longer than it takes to get back into either maintenance or quality control.

10. I live about 55 miles from work and there are times when I am told that we will be working overtime and I drive my car instead of carpooling. Then, at the very last minute, they cut the overtime and I end up spending gas money instead of earning it. This happens quite often.
11. I would like to see something done about the guy who works with real dedication everyday and the ones who like to waste time. There are often times when a person has to carry someone in the shop and comes up with hours left so the one who was goofing off can account for some extra time. It seems the supervisors don't have too much say-so. The worker still does what he wants.

12. To Whom this may concern:

I feel too much emphasis is stressed upon productivity in this center. One knows the importance of being competitive, for I have also labored on the outside before Civil Service. I know my effort or how hard I must labor in order to keep my job. Make no mistake, I love my job.

What ails my carcass, is the way management has power.  
The Union is worthless - and so are the rights of any man.

Let's try and forget productivity for a little while and concentrate on the rights of the employee. We the employee(s) are the ones that have his Depot where it is today.

13. I firmly know that the promotion procedures here do need to be changed, because a hard working person does not advance in pay or grade as well as he or she should. I think this is a problem that needs attention.
14. I believe that if a survey is taken, no smoking should be observed in the room, and also CCAD meetings (shop, safety, etc.). I am offended by sitting next to a smoker!
15. I have not seen the full effect or changes that the STEP program is supposed to implement.

I am sure that the results of the program will have a significant impact on the work centers' product output and the overall employees' morale at the work center.

With a few refinements, the STEP program will eventually take effect on the whole workforce's attitude and productivity will be on the upswing.

16. Question #83. Item 3. How did the "Hispanic" classification come about? Over 95% of the people I know disagree with it.
17. Remarks: Why don't we have any heaters where I work? It's too cold.



18. I disagree with promoting people because of ethnic background, discrimination because of color, race, sex, etc. Promote because the person merits that position.

Do not promote because of favoritism.

Give jobs to people who can do the job.

19. I don't think this program (STEP) will make any difference, but I hope it will.

We need to see that the best qualified people are moved into the right positions, so that we can get the support we require.

20. My job at CCAD is the best job I ever had. I enjoy my job, but I think the supervisors have a little too much power under their belts. They are at the point where they're just about demanding you work overtime.

There is no appreciation for the work you do.

21. This survey is not going to change anything. Everything is going to go on as it always has.

22. We need more QC work leader personnel to speed up the operation for this Depot.

23. Question #15. Commanders Guidance Bulletins and Rules Governing Conduct and Behavior of employees are available, but many people never read. If they do, they never understand them.

Question #22. There are several people in the management chain, above the shop supervisor, who are mentally unable to cope with people situations of any kind that do not totally agree with their personal views. They are unable to separate their personal prejudices from business.

24. I would like to make a few comments: Several fellow workers would appreciate it, and would feel much better about their work upon completion, if they were congratulated on their fine work. This is not done in our shop. I think that our morale would increase greatly if we all had "a pat on the back" when it is deserved.

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Note. All comments are slightly edited to enhance readability. More significant changes are indicated by brackets, i.e., [ ]. An asterisk (\*) is used to denote the deletion of information that might violate the confidential nature of the response.

FORMATIVE EVALUATION V (FEB-JUNE 83)  
OF THE SOCIOTECHNICAL EVALUATION PROGRAM (STEP)  
AT THE CORPUS CHRISTI ARMY DEPOT

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SCOPE OF THE EVALUATION

This evaluation covers the activities from early February 1983, through the 16 June In-Process Review (IPR). This period of time consists of the first six months of the formal implementation of the STEP recommendations at the Corpus Christi Army Depot (CCAD).

The information for this formative evaluation is based primarily on three site visits, one each in February and March by the author, and another in June with a second ARI researcher. During each visit extensive direct observations were made and detailed interviews were conducted with representative cross-sections of managers and workers at the Depot.

At about this time, the results of the December 82 Employee Survey and a special Work Center Survey administered in March were available. The second administration of the Employee Survey was conducted in June, but the results of this administration were not available for this evaluation and will be included in Formative Evaluation VI.

FEBRUARY 1983 SITE VISIT

Description

The primary purpose of this visit was to further define the productivity and quality of working life (QWL) measures to be used in the Army Research Institute's (ARI) evaluation of STEP and to help set up a reliable reporting system. Plans were also made during this trip to develop a Work Center Survey (see Appendix A) to periodically query each work center supervisor about changes and key activities affecting their work center.

Interviews were conducted with the Commander, the Director of Maintenance, other key senior level managers, and resource persons for the data collections. At this time, the Director of Resource Management had been put in charge of the implementation of STEP in an effort to centralize control and to provide a higher level of resource support to the implementation. This was in direct response to internal criticisms voiced during the December 83 IPR.

Throughout this visit, it became increasingly clear that measurement would not be an easy task. Available data tended to be incomplete or in a form that was not amenable to analysis. Consequently, it was determined that the most reliable source of information would be existing CCAD reports. Due to the complexities of this data, it was unrealistic to expect untrained personnel to consolidate the large volume of existing data into a meaningful and reliable form and all data were consequently to be forwarded to ARI "as is."

Despite early hints of measurement difficulties, CCAD was willing to do whatever was necessary to provide ARI with the resources it required. ARI researchers were encouraged to be thorough, to "learn the Depot," and to observe and interview as many people as possible, at all levels in the organization. This cooperation was evident at all levels and ARI researchers were never denied access to anyone. Everyone they talked with spoke frankly, openly and without evidence of constraints.

During this visit, the Dallas Field Office of the U.S. Army Civilian Personnel Directorate was conducting a survey of CCAD employee attitude and morale. They were most interested in STEP and offered to share their data with ARI. The 80% plus response rate that they received on their mailout questionnaire suggested that the second administration of ARI's Employee Survey might be mailed out rather than group administered as was done in December 82.

Throughout the Depot, there was considerable enthusiasm, increased innovation, and enhanced communication. For example, the consolidation of "Production, Planning and Control" for engines, transmissions, and airframes in one division permitted a procedural change in which engines and transmissions would be evaluated earlier to ensure more repair time before installation.

In another instance, with the assistance of the Depot Organizational Effectiveness Consultant, the Chief of the Production, Planning, and Control Division (PPC) surveyed his supervisors, section and branch chiefs to poll their expectations and concerns. The questions were frank and not always easy to answer. Nevertheless, honest and candid answers were prepared by the Chief (PPC) for all questions and both the list of questions and answers were distributed to all those who had been surveyed. This type of effort of a senior manager clearly showed management's intent to listen, to be more participative, and to solve problems as a team.

Despite the general enthusiasm, there were some minor concerns that the mechanisms for the implementation of the recommendations were not in place before implementation. This appeared to be a particular problem with the recommended training, since there were no instructors or course materials immediately available.

## Evaluation

This early phase of the implementation was a period of adjustment, as early energies and enthusiasms were turned to the task of developing the mechanisms for implementation. There was considerable optimism and a strong desire "to do this right" and to make STEP a success. Earlier identification and designation of responsibility for implementation would be desirable.

## MARCH 1983 SITE VISIT

### Description

The purpose of this visit was to more specifically identify which existing Depot reporting systems (printouts) would be most useful for ARI's evaluation of the STEP project. A special survey was developed and administered at this time to ask supervisors what changes--of any kind--may have impacted on their work center in the recent months. Additionally, they were asked what reports they use to "track" their work centers. This survey and its summary report are shown in Appendix A.

Numerous interviews were conducted with mid-level managers to identify which of the hundreds of Depot printouts might be most useful for ARI's measurements. Points of contact were established in various areas to begin data-gathering for both the current and prior years.

The results of the Work Center Survey (Appendix A) showed that there were few (11 of 45) supervisors who reported any "MAJOR and UNUSUAL" changes in their work center. Only a few attributed these changes to STEP. Morale was "average" or "above average," although a few supervisors indicated there had been some initial decreases after STEP. Few supervisors were able to provide leads on work center measures, other than the traditional Depot-wide indicators.

### Evaluation

It was clear from the Work Center Survey that much of STEP had not yet been realized at the work center level. An article describing an early "success story" in the Aircraftsman, the CCAD newsletter, at about this time would have been useful.

Although initially conceived to be a periodic survey of work centers, the Work Center Survey in its present form was not particularly sensitive to changes in productivity, the QWL, or uniquenesses among the work centers. Consequently, additional administrations were not planned.

The definition and identification of productivity and QWL measures was proceeding slowly. This can be attributed directly to the complexity of the task and the increased realization of the inadequacies of existing data bases.

## JUNE 83 SITE VISIT AND IPR

### Description

During this site visit the second wave of the Employee Survey was administered, ARI provided feedback to CCAD on the DEC 82 survey, made a presentation during the IPR, and conducted numerous interviews with workers impacted by STEP.

Employee Survey. Except for a few minor editorial changes, this was the second administration of the survey administered in DEC 82. In order to save time and to permit a larger sample size, the survey was mailed to a representative sample of 727 employees and supervisors, including all of the nearly 300 employees of the DEC 82 administration. Over 600 surveys were returned in less than three days in the sealed envelopes that were provided with the survey.

Feedback Report. This report of the first administration of the Employee Survey was presented and discussed with the CCAD Commander and key staff. This report is contained in its entirety in Appendix B. Appendix C contains the handwritten comments received on the survey.

June In-Process Review. Appendix D contains the agenda and handout for the June IPR. Except for the two researchers from ARI, all attendees at the IPR were Depot managers, members of the STEP Design Group, or key persons involved in the implementation.

Unlike previous IPRs, the briefings were made by the Depot personnel most closely associated with the implementation of each recommendation. This suggests that the implementation had successfully become a Depot activity rather than a STEP Design Group activity.

The handout in Appendix D shows the progress, milestones, problems, and feedback associated with the STEP recommendations and related activities. Rather than discuss each in detail, only a few highlights will be presented.

The general tone of the IPR was positive and reflected considerable satisfaction with the changes and progress that had been made. Throughout the IPR there were repeated references to the fact that "it was too early to tell" if the changes were successful, although there were frequent cites of anecdotal evidences that the changes had already had some positive results and were well-received. A frequently cited reason for it being "too early to tell" was the fact that the training recommended by STEP was not yet fully completed. This is important, since training was a key prerequisite for some of the major recommendations.

There was a shift in focus on several of the recommendations. The recommendation to rotate mechanics through ASTORS was "overtaken by events," and was not considered cost-effective at that time. The economic analysis (EA) of the hardware carousel showed it was not cost-effective and it was disapproved. A scaled-down version of the carousel for common hardware in the

Supply Directorate was similarly disapproved by DESCOM, although the feeling at the IPR was that it may have been misread or misunderstood. Additional work will be done to clarify the proposal.

The long-range proposal to streamline the flow of aircraft was variously labeled a "false start" and "pie-in-the-sky." Others argued, however, that it was a long-range concept that never pretended to be a final plan. It was more a concept to strive for when opportunities to implement it become available.

ARI's presentation focused on the history and background of Sociotechnical Analysis, ARI's role in the project, and a brief overview of the evaluation approach, the results, and the difficulties encountered.

Data Collection. A review of the "hard" data gathered to date suggested that tracking all 60 work centers affected by STEP would be an impossible task and that focussing on a limited number of key work centers for an in-depth analysis would be more appropriate. These work centers are shown in Appendix E.

The data gathered continues to be incomplete due to a variety of inconsistencies in the reporting systems. Identical data from separate sources frequently fail to match. Monthly (weekly) variations in the data are large and often uninterpretable, particularly in the absence of relevant information about extraneous events that might have contributed to the variations.

Observations and interviews. Over 30 interviews were conducted, with top managers, supervisors, and employees in key positions impacted by STEP. Only the major observations and findings will be reported here.

- Both the role and perception of the Production Controller (PC) depends heavily on the personalities of the individual PCs involved. Similar variations of roles are evident for Maintenance Verifiers.
- Training is the biggest plus coming out of STEP. Support for training was unanimous, although at least one senior person was not sure it was the best way to go--"productivity-wise." Quality of training received was excellent.
- There is a continuing need to define and clarify the roles of supervisors, PCs, Maintenance Verifiers, etc.
- Some smoother flow of work is already perceived by some.
- The hardware carousel was lost because it was misrepresented. Rivalries and politics were perceived to be factors.
- Maintenance Verifiers are seen by most to be useful "buffers" between mechanics, PCs, Quality Inspectors, and others, and seem to be in a good position to troubleshoot, break down barriers, and suggest constructive remedies.

- The Depot's in-house effort to measure STEP using the QPR (Quality-Productivity Ratio) procedure described by the sociotechnical consultants is meeting with the same difficulties as ARI's measurement effort.
- Depot-wide concern about high indirect labor costs is great.
- It is highly essential that Quality Inspectors, Maintenance Verifiers, and Production Controllers are experts in the areas of their jurisdiction. This is not always the case.
- Pre-Shop Analysis (PSA) Examiners and Quality Inspectors work closely together and with "good relationship." STEP merger of these people in same unit has been done before. Nothing is different. Biggest problem is the changing of work requirements by TSARCOM.
- Low morale is evident in the Disassembly Shop due to their inability to get quality new personnel and inability to move WG-5s into WG-8 slots when these slots were "frozen" for downgraded employees. This shop has not had any cross-training or WG-2 aircraft movers (as promised by STEP), and feels it gets no help or feedback from higher levels.

#### Evaluation

A number of issues and observations emerged during the two weeks of this site visit. Some of them pertain directly to the Depot, but others are relevant to the process of organizational change in general.

First, it had become apparent that change was going to be slower than had originally been hoped. This was largely due to the extent and depth of training that occurred during this time. Compounding this was Headquarter DESCOM pressure to reduce the proportion of indirect labor hours charged to UH-1H overhaul.

Direct/indirect labor ratio. The extensive training during the first half of 1983 no doubt contributed to the higher proportion of indirect labor hours, but other factors were also relevant. These other factors highlight the interdependence of productivity measures and strongly argue against the use of a single measure as an index of productivity. Overtime, for example, is a relatively inexpensive and quick way to decrease the proportion of indirect labor hours and in the time immediately preceding the June IPR, overtime had in fact been controlled (by management directives) at a low level.

Additionally, it is important to recognize that an increase in the proportion of indirect labor hours may simply reflect an increase in technology. For example, where there were once five direct laborers and one support (indirect) worker, there may now be a robot operated by one person (direct) supported by three or four indirect workers. Although this decreases the ratio of direct to indirect hours dramatically, overall productivity may actually have increased.

CCAD's direct/indirect hours ratio must also be evaluated in the context of some other variables. As a government facility, it has demands placed on it over and above those of private industry. CCAD must not be compared to other Army Depots. Comparisons to Air Force and Navy aviation maintenance facilities would be more appropriate. Aircraft maintenance and overhaul standards are clearly different from those applicable to land vehicles.

CCAD can also not be compared to a manufacturing plant. CCAD repairs and overhauls aircraft that vary widely in type of equipment and state of repair. Such variations contribute substantially to increases in indirect labor hours, since parts have to be ordered, routed, stored and handled in special ways. The increasing age of the aircraft additionally aggravate the situation as parts become more difficult to service or acquire.

Finally, the definition of direct/indirect labor is anything but precise and permits considerable latitude for interpretation at the mechanics' and first-level supervisors' levels. Such latitudes, intentionally or unintentionally, can substantially alter the direct/indirect ratio from reporting period to reporting period.

This discussion of direct/indirect labor hours was not designed to belabor the obvious, but to make a few specific points. First, measurement of productivity is complex and must consider the context in which it is made. Second, at a minimum, measures must be defined with reasonable precision to permit reliable reporting. Third, measures must be compared and interpreted against appropriate control data. And finally, the meaning of the measure as an indicator of productivity needs to be clearly understood.

Turf issues and personalities. Turf issues and personalities play an integral role in organizational change. Even with the participative philosophy of STEP, some turf issues remained unresolved. Some pertained to who would do what, others had to do with "rivalries" resulting from a program, recommendation or idea "not having been invented here." Some particularly strong personal feelings were felt by some people who had not been selected for the promotions or new assignments resulting from STEP. This latter situation was particularly evident if the selection process was in some way perceived to be biased or arbitrary.

Personalities also play a significant part in the way various job roles are perceived and implemented. This is particularly true for the Supervisor-Production Controller interaction. Usually, the most power, authority, and responsibility is assumed by the more dominant individual in the pair. This can lead to considerable variation in the way different Supervisor-Production Controller pairs operate.

Turf issues and a certain possessiveness about the STEP recommendations were clearly evident in the great care that was taken during the IPR not to "offend" anyone whenever a recommendation was dropped or altered in some way.



There still appeared to be two distinct factions, those directly involved with STEP and the rest of the Depot. Greater emphasis on making all the recommendations Depot recommendations would be desirable.

Categories of recommendations. Similarly, tensions might be eased further if the STEP recommendations were considered more explicitly dynamic and subject to change. This would permit changes more readily and with less stigma. As is, there are those detractors of change who will capitalize on variations of parts of the original plan to discredit the entire plan.

On a larger scale, the discrediting of the entire project on the basis of a rejection of one proposal or recommendation can similarly be diminished if the recommendations are initially presented in categories based on the likelihood or timeframe of their implementation. This way, the non-immediate implementation of a long-range or more idealized objective will draw less criticism.

Consultants. It was also apparent that implementation would have been facilitated had the consultants remained available for a longer period of time. They would have been able to facilitate communications across organizational boundaries and act as buffers and impartial arbiters in cases of disputes. As outsiders to the organization they might have been able to see and recommend alternative procedures to enhance the entire implementation process.

Public relations. Additional public relations efforts would have been helpful during this phase of the implementation. ARI's offer to do a piece for the Aircraftsman was one step, but feedback and information articles generated from within CCAD would have been helpful in maintaining the momentum.

Documentation. Another area of concern is documentation. There is seldom too much documentation, and except for this series of formative evaluations there are no formal written narrative accounts of the IPRs or other significant events in the STEP implementation. Per ARI's recommendation, the Chief of Production Planning & Control has begun to maintain a log of notes and materials about major events impacting on the QWL and productivity of the Maintenance Directorate. This includes noting some of the day-to-day innovations, solutions, and other initiatives that might have been precipitated or made possible by the STEP philosophy.

Cost/benefit accounting. Cost/benefit accounting is no easy task, but it is something that ultimately needs to be addressed. Questions of what to include in the costs or benefits of STEP are complex. For example, should all the training costs be charged to STEP? Some would argue that the training needs identified by STEP were a prior debt of the Depot and its costs should not be charged specifically to STEP. More commonly, all costs incurred by an intervention, even if only identified, need to be charged to the intervention.

The overriding rationale is that without the identification of the need or requirement, the cost (even if a legitimate prior debt) would not have been incurred. Conversely, all tangible and intangible benefits accrued to remedying the prior deficiency can be credited to the intervention. More precise delineations are seldom possible.

At this time, there is no running summary of STEP costs, despite claims that costs are being tracked. At a minimum, such tracking should accumulate the nonwork hours spent on STEP by the STEP Design Group, the employees and managers involved in meetings and surveys, and the training time. After several days of effort, it was possible to establish the numbers of people who had been trained to date. This information is contained in Appendix F and shows the extensiveness of the training effort.

#### SUMMARY

In summary, the Depot is making considerable progress in the implementation of the STEP recommendations. Despite the considerable enthusiasm and energies to "do it right," there is the increasing recognition of the realities of organizational change--everything always takes longer than expected and tangible results are difficult to demonstrate. Consequently, six months into the implementation of STEP is too early to expect major changes in the project objectives, i.e., increased productivity and QWL.

## APPENDIX A

### FEEDBACK SUMMARY OF THE WORK CENTER SURVEY, INCLUDING THE SURVEY AND RESULTS

Paul van Rijn, Ph.D.  
US Army Research Institute  
23 March 83

This report summarizes the results of a Work Center survey administered to all first-line supervisors and section chiefs in units affected by the Socio-Technical Evaluation Program (STEP) being conducted at the Corpus Christy Army Depot (CCAD). The purpose of this survey was to solicit narrative input from Work Center managers about changes in the productivity or quality of working life in their Work Center. This input will be used in the interpretation of the numerical data being accumulated by the Army Research Institute (ARI) in its evaluation of the STEP program.

The surveys were distributed through normal channels at CCAD to all first-line supervisors and section chiefs in the key units affected by STEP:

- Airframes Shops Division
- Production Planning and Control Division  
(Airframe Production Planning Branch)
- Maintenance Quality Control Division
- Depot Property Division

Forty-Four (44) completed surveys were returned to the Organizational Effectiveness Consultant, the local point of contact for the survey. One set of responses was obtained through an interview. The 45 respondents represent all the targeted units directly affected by STEP.

#### Results

Exhibit 1 shows the complete survey and the tabulations of the responses to each question.

For questions 1 and 2, only 11 of the 45 respondents reported any changes in productivity or the quality of working life in their Work Center. This is surprisingly few considering the large reorganization that occurred as a result of STEP, i.e., 434 personnel actions. The results may be low because the role clarification and the implementation of the extensive training program have not sufficiently progressed to the first-line supervisory level.

Of the respondents who observed a change in their Work Center, most were from Work Centers that were directly impacted by the STEP reorganization. It was also within these same Work Centers that there were reports of some initial decreases in morale, but that these were starting to get "turned around." In general, the influx of new personnel and the increase in training are reported to have boosted morale significantly and can be expected to have a positive effect on productivity.

Of the 45 respondents, 7 believed that "Most of the changes in their Work Center are due to STEP." Four (4) believed that only a "minor part" of the changes were due to STEP. Most (24) indicated that there were "no changes," and 9 indicated that it is "impossible to say" how many of the changes are due to STEP.

Based on question 4, the majority (25) of respondents indicated that morale in their Work Center was "average." Another 18 indicated it was "above average." Only 2 respondents rated their Work Center morale "below average."

Question 5 was designed to elicit specific information about the data used by supervisors to track the productivity and morale of their units. Although many comments were received, they often were not specific enough to identify the data base used.

Question 6 solicited comments about other things that might be considered for improvement by STEP. Some of these comments were:

- improve sanitation in certain restrooms and break areas
- use performance testing in promotion system
- assure expertise of PSAs, QA inspectors, and PCs.

#### Summary and Conclusions

Despite the significant activity and changes resulting from STEP, much of this has not yet been realized at the Work Center level. An article in the Aircraftsman or other appropriate vehicle may be useful in highlighting and communicating what has already been done.

The survey itself requires revision in order to elicit more specific and meaningful comments for use in the interpretation of the numerical data. It will also be useful to obtain the input of CCAD managers above the section level and to elicit more specific "success" stories or problem areas.

EXHIBIT 1

Work Center Survey With Supervisor Responses 8 March 1983

SUBJECT: Army Research Institute Work Center Survey

FROM: Paul van Rijn, Ph.D.  
Research Psychologist  
Us Army Research Institute

TO: Airframe Shops Division, Production Planning & Control Division, Maintenance, Quality Control Division, and Depot Property Division

In order to more effectively monitor and evaluate possible changes in the productivity and quality of working life in your Work Center (Division, Branch, Section, or Unit), please take a few minutes to complete the attached survey and return it to Mr. Dwayne Scarlett, STOP 11, before COB Friday, 11 Mar 83, if possible.

The information you provide will be used by the US Army Research Institute to more accurately interpret the numerical data they are accumulating as part of their evaluation of the Socio-Technical Evaluation Program (STEP) being conducted at CCAD.

The answers you provide will help provide a more accurate picture of your area of responsibility and provide you an opportunity to suggest improvements that will contribute to the effectiveness of your area.

The survey should only take a few minutes of your time. BE THOROUGH BUT BRIEF.

Thank you for your time and assistance in this important project.

YOUR WORK CENTER NUMBER: \_\_\_\_\_

All questions concern only the activities of your Work Center.

1. Since the implementation of STEP on January 19, 1983, were there any MAJOR and UNUSUAL changes in personnel, procedures, projects, or equipment that may have increased or decreased the productivity of your Work Center? Consider unusual factors in work stoppage, part shortages, personnel turnover, training, accidents, sick/annual leave, bad weather, equipment failure, special projects, procedure changes, etc.

CHECK ONE: 11 YES 34 NO

If "YES", briefly describe these changes and show how (i.e., increased or decreased) they affected PRODUCTIVITY.

- new equipment for safer operation
- new and skilled employees lead to increased productivity
- promotion, cross-training, courses lead to increased morale
- monthly schedules for paint unit on time for first time
- decreased workload in anticipation of equipment change--not due to STEP
- in my work center mechanics and work leaders are still doing work of PSA
- increased personnel
- increased role enhancement and OJT with management support
- we are a new Work Center with extensive training
- better scheduling and material support
- some decrease due to move and too early fill vacancies
- WG-2 laborers to move aircraft leads to increased productivity for mechanics
- Maintenance Verifiers will be invaluable in training maintenance crews
- "100% kit fill" goal for PCs will free mechanics from "parts chasing"
- increased coordination between Maintenance and Quality

2. Since the implementation of STEP, were there any MAJOR and UNUSUAL changes in your Work Center that affected the Quality of Working Life or morale?

CHECK ONE: 11 YES 34 NO

If "YES", briefly explain:

- training details out of "dead-end shop" have increased morale
- increased promotion leads to increased morale
- with changes, an initial decrease in morale--now increasing
- increased congestion in work area
- new positions created
- shop loading and scheduling led to no slippage and 1 aircraft was overproduced in February
- new Work Center--increased morale
- mechanics` job is easier without the need to chase parts

3. To what extent would you attribute any changes in productivity or the quality of working life to the STEP program - either directly or indirectly?

CHECK ONE:

- 24 There have been no major changes since 19 January 1983.  
2 None of the changes are due to STEP.  
4 Only a minor part of the changes are due to STEP.  
7 Most of the changes are due to STEP.  
9 It is impossible to say how much of the changes are due to STEP.  
( 1 Double Response)

4. Since implementation of STEP, how would you rate the overall morale of personnel in your Work Center?

CHECK ONE:

- 2 Below Average                    ( 1 No difference)  
25 Average                        ( 1 Improved to "good" from "average")  
7 Good  
9 Very Good  
2 It Couldn't Be Better

5. In managing your Work Center, what do you consider to be the most useful numerical indicator(s) (data, reports, forms, computer printouts, etc.) of the productivity, achievements, and morale of your workforce?

- |  |  |
|--|--|
| <input type="checkbox"/> Work Center Activity Report             | <input type="checkbox"/> Leave Usage Report          |
| <input type="checkbox"/> Commander's Special Bulletins           | <input type="checkbox"/> Weekly Discrepancy Report   |
| <input type="checkbox"/> Work Center Labor Summary Report        | <input type="checkbox"/> Production Record Report    |
| <input type="checkbox"/> annual leave emergency leave usage down | <input type="checkbox"/> sick leave usage down       |
| <input type="checkbox"/> increased aircraft produced             | <input type="checkbox"/> increased safety            |
| <input type="checkbox"/> increased incentive awards              | <input type="checkbox"/> MIS-Q printouts             |
| <input type="checkbox"/> Employee Work Assigned Records          | <input type="checkbox"/> DIMES reports               |
| <input type="checkbox"/> Work Center Detail Performance Report   | <input type="checkbox"/> Monthly Defect Summary      |
| <input type="checkbox"/> Aircraft In-Process Master File Recap   | <input type="checkbox"/> Work Center Standard Index  |
| <input type="checkbox"/> Current In-Process Item Shortages List  | <input type="checkbox"/> Master PCN to SUBPCN Report |
| <input type="checkbox"/> Parts Shortage Assembly Station List    | <input type="checkbox"/> Production Report           |
|  | <input type="checkbox"/> Supervisory Leave Report    |



6. Please provide any additional comment(s) about STEP or your Work Center in the space below. Is there anything else that you would like to see done?

- upgrade this Work Center
- no changes in this WC due to STEP
- health & sanitation in restrooms and break areas should be looked into and improved where needed
- would like to see promotion system based on performance testing
- expect effects of STEP in other areas to improve this Work Center
- could use a break area for lunch and shop meetings
- STEPs effects need more time to be noticed
- need PSAs, QA inspectors, and PCs who know our WC content area, its capabilities, and requirements
- expects significant improvement if STEP is implemented fully-- especially if PSAs become more knowledgeable in areas of responsibility
- PC still needs much improvement
- changing of QA inspectors should be less disruptive
- Maintenance Verifiers should help some but they still work for Maintenance
- STEP has led to identifying other problems
- attendance records should get better after forced leave and new employment
- anticipate drastic drop in direct labor used for production control support
- need a better measuring system

THANK YOU FOR YOUR PARTICIPATION IN THIS SURVEY.

If necessary, who may be contacted by the US Army Research Institute for additional information about the work of your Work Center?

NAME (Please Print): \_\_\_\_\_

POSITION TITLE: \_\_\_\_\_

AUTOVON NUMBER: \_\_\_\_\_

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NOTE: For additional information about this survey or the Army Research Institute evaluation, you may call Dr. Paul van Rijn, AUTOVON 824-8293.

APPENDIX B

FEEDBACK REPORT

The Corpus Christi Army Depot Employee Survey:  
Development, Description, and Results

US Army Research Institute  
for the Behavioral and Social Sciences  
Alexandria, VA 22333

June 1983

During the week of 13-17 December 1982, researchers from the US Army Research Institute administered the Corpus Christi Army Depot Employee Survey to a sample of employee and supervisors who work in the Air Frames Division. The employee survey was designed to tap employee perceptions of characteristics of the social system, technical system, and effectiveness of work centers. This feedback report will describe the survey, the development and administration of the survey, the general research context, the sample of participants and the results of the questionnaire.

Attached to this report are the results of the statistical analyses performed on the data which came from the survey. The report will also include a description of scales and items, their meaning, and their relevance to the larger research context.

### Background

The Sociotechnical Systems Evaluation Program (STEP) was initiated at Corpus Christi Army Depot (CCAD) in April 1982. At that time, the STEP Design Group was formed consisting of 12 representatives of the Air Frames Division, and it began the first phase of sociotechnical systems analysis. The first phase involved an analysis of the social and technical system of the UH-1H overhaul and repair process, and an investigation into the key variances and social systems relationships which were hampering the effectiveness of the production system and the quality of working life. Based on the analyses, the STEP Design Group developed a set of recommendations for organizational change which, if implemented, would help to improve jointly the social and technical systems, improve the fit between the two systems and increase the overall effectiveness of the UH-1H production system.

Two basic principles underlie sociotechnical systems analysis. The first is the principle of joint optimization which states that an organization will function optimally only if the social and technological systems of the organization are designed to fit the demand of each other and the environment. Sociotechnical systems analysis focuses on the total organizational system, and emphasizes the "product-in-being," the process in which a product is converted from raw materials to the end result. This perspective guarantees that both the social and technical system are attended to simultaneously and that techniques to increase effectiveness are applied to both systems.

A second sociotechnical system analysis principle involves controlling and redesigning social and technical systems in order that coordinating capabilities of organizational members are put to use in completing the work and coping with any variances in the work system. The basic idea of this principle is to return responsibility for work and autonomy to the worker. In this way organizational personnel are expected to gain control of task performance and enhance coordination of tasks. Contingent on this principle of worker control is a theory of human needs which provides for the recognition that, jobs at least to some minimum extent, should provide workers with: variety, opportunities to learn, areas for decision-making, opportunities to relate one's work with the larger mission of the organization, and a work group situation which gives the individual worker support and recognition.

Generally, this requires that the organization become less structured and less bureaucratized in order to give the organizational member greater control over both the process and product of work.

In order to determine if the implementation of STEP recommendations is having its intended impact it is necessary to institute measurement procedures which track the state of the organizational before, during and after the implementation. There are several approaches to this type of measurement. One way is to ask persons involved in the intervention about their perceptions of the nature of work, the characteristics of their work organization, and changes due to organizational interventions. The US Army Research Institute (ARI) which was charged with doing research to measure organizational change at CCAD during STEP, developed a survey designed to tap these perceptions of the employees who work in the Air Frames Division and whose work is directly part of the UH-1H production system.

#### Development and Description of the Employee Survey

Generally, the survey was designed to measure the two basic principles of sociotechnical systems analysis: (1) To determine if the fit between the social and technological systems have changed, and in what way, and (2) if the structure of the work organization has changed such that organizational members are able to increase job autonomy, control over the work process, areas of decision-making, and to improve the type and variety of work that they do. Therefore, the survey includes questions which ask employees for their perceptions about the characteristics of the social structure of their work centers, the technology of their work centers, their perceptions of productivity and morale, and their knowledge and understanding of STEP and its impact on their work organization. The Corpus Christi Army Depot Employee Survey consists of 80 questions which can be categorized into the following areas:

- Characteristics of work center structure
- Characteristics of work center technical system
- Perceptions of alienation from work
- Morale
- Perceptions of work center productivity and morale
- Awareness of STEP
- Expectations of STEP
- Demographics

Each item and scale was drawn from other established survey instruments which have been used to measure characteristics of organizations, the work process in organization, worker perceptions of their organizations and organizational change. These items and scales have all been used previously and, therefore, have been tested and refined.

Exhibit 1 provides a list of all items and scales, which were included in the survey. It also provides a listing of survey items from which the scale was composed, scale definitions and instructions for interpreting scale means (averages) and standard deviations (variability of scores).

Exhibit 2 contains two copies of the Employee Survey. The first copy shows the percent of responses by the employee sample to each category of each item, and the second shows percent of responses by the supervisor sample to each category of each item. Also included on the copies of the surveys is the mean response, and the standard deviation for each item. A summary of scale means and standard deviations is provided in Exhibit 3. Also included in the summary table is a comparison of scores for the supervisor sample and the employee sample, and the total of the two samples.

#### Administration

The surveys were administered during nine separate sessions to groups of employees. Each group received the same set of standardized instructions for completing the questionnaires. Respondents were encouraged to give frank and honest answers, and the confidentiality of responses to all questionnaire items was stressed.

At the time the surveys were administered, many of the first-line supervisors who had been chosen for the sample were unavailable for the scheduled administration sessions. Therefore, the Organizational Effectiveness Consultant of CCAD distributed the survey to those supervisors who were chosen for the sample, and when the surveys were returned the completed forms were mailed to ARI.

In order to track changes over time, as STEP recommendations for organizational change are implemented, and to try to determine the extent to which STEP impacts on the organization, it is necessary to take measurements before the implementation occurs, during and after. Consequently, the ARI survey was administered, and "measurement" taken for the first time in December 1982, before STEP recommendations were implemented in 1 January 1983. The survey was administered to a sample of first-line supervisors and employees.

#### The Sample

The sample of research participants was drawn from a listing of all employees in the Air Frames Division. A large proportion of the UH-1H production systems exists in the Air Frames Division, and so the STEP implementation which focuses on that system is concentrated in this area. Consequently the survey was administered to members of that Division.

In order to decrease the burden on CCAD and yet to maintain an adequate statistical sample, it was decided that the sample would consist of one-third of the entire Air Frames Division population (which consists of approximately 900 people and 40 work centers). Within each work center one-third of the employees were sampled on a systematic basis by grade level. In other words, the sample from each work center was chosen so that it was representative of all grade levels within that work center. Of the work center was small, and the sample of that center fell below five people, then the work center was oversampled to bring the number up to at least five.

The final sample included 271 employees and 39 first-line supervisors. Exhibit 4 represents data describing the demographic characteristics of both the employees and the first-line supervisors who completed the survey.

The data in Exhibit 4 indicate that the personnel in the sample, for the most part, are male, middle-aged, and Hispanic and Anglo. A large majority of the sample have worked at the Depot at least eleven years, and have been in their work centers more than one year. Furthermore, the majority of the sample has stated that they probably or definitely plan to stay at the depot until retirement. All in all, the sample represents a relatively stable work force. The data also indicate that the sample is composed mostly of people who are high school graduates (or have high school equivalency degree) and have either some college or technical training.

EXHIBIT 1

Employee Survey Scales and Items

- I. Hierarchy of Authority Scale: The extent to which decision-making is centralized or located at higher levels of the organization.

Items in Scale:

1. I have to check with the boss before I do almost anything.
5. Only persons in management positions can decide how a job should be done.
9. I feel that I can act as my own boss in most matters.
12. Even small matters have to be referred to some higher-up for a final answer.
13. There can be little action until a supervisor approves a decision.
21. I get work orders from the same person all the time.
25. I can make my own decisions without checking with anyone else.
33. People who like to make their own decisions would become discouraged here.
37. Everyone here has one superior to whom he or she reports regularly.
39. How things are done around here is left pretty much up to the persons doing the work.
47. I can get supplies without clearing it with my superior.
48. Any decision I make has to have the boss's approval.

- II. Procedural Specification Scale: the extent to which organizational members must follow organizational defined rules, procedures and regulations in dealing with situations which they encounter.

Items in Scale:

2. The organization stresses following the established procedures.
16. At times, going through the proper channels becomes more important than getting the work done.

17. Standard procedures are to be followed in almost all situations..
20. I am encouraged to "cut red tape" in order to get the job done.
32. Red tape is often a problem in getting a job done.
41. Going through the proper channels at all times is constantly stressed.
42. I am left to my own judgment as to how to handle most problems.
44. Most of use are encouraged to use our own judgment in handling everyday situations.
51. Whenever I have a problem on the job I am supposed to go to the some person for an answer.
56. I have to follow strict operating procedures at all time.

III. Presence of Rules Scale: the degree to which the behavior of organizational numbers is subject to organizational rules and regulations.

Items in Scale:

6. There really are no specific rules in this work center.
8. The people in this work center understand how they should act.
10. It seems as though there is a rule for everything here.
11. Nothing is said if you come to work late occasionally.
15. My work center has a manual of rules and regulations to be followed.
22. I feel that I am constantly being watched to see that I obey all the rules.
23. I make my own rules on the job.
30. I am expected to follow orders without questioning them.
34. I am not allowed to leave my working area without permission.
49. I am constantly being checked up on for rule violations.

IV. Division of Labor Scale: the extent to which tasks are subdivided by functional specialization.



Item in Scale:

4. People working here usually find their jobs monotonous.
7. Most jobs in this work center involve a variety of different kinds of activities.
27. Most jobs in this work center have something new and different happening from day to day.
36. In this work center there is something new and different to do almost every day.
38. I usually work under the same circumstances from day to day.
43. Each person in my work center has a specific job to do.
45. No two days are ever the same in this job.
50. This work center has a complex division of labor.
54. Everyone in this work center has a specific function which he or she has to perform.
57. One thing people like around here is the variety of work they get to do.

V. Task Variability Scale: is the number of exceptions encountered in the characteristics of work and perceived variations of incoming work materials and objects.

Items in Scale:

66. To what extent do you perform the same tasks from day-to-day?
67. How much the same are the day-to-day situations, problems, or issues you encounter in performing your major tasks?
68. During a normal week, how frequently do exceptions arise in your work tasks which require very different methods or procedures for doing it?
69. How often do you follow about the same work methods or steps for doing your major tasks from day-to-day?

VI. Task Difficulty Scale: the degree to which work is analyzable and predictable. The extent to which characteristics of the materials and objects worked on can be understood, and the ease of diagnosing work methods and developing strategies to deal with work.

Items in Scale:

- 70. How easy is it for you to know whether you do work tasks correctly?
- 71. What percent of the time are you generally sure of what the outcomes of your work efforts will be?
- 72. In the past 3 months, how often did difficult problems arise in your work for which there were no immediate or apparent solutions?
- 73. About how much time did you spend solving these work problems?

VII. Morale: the respondent's reported level of satisfaction with the immediate work situation.

Items in Scale:

- 3. All in all, I am satisfied with my work center.
- 19. All in all, I am satisfied with my supervisor.
- 40. All in all, I am satisfied with my present job.
- 46. All in all, I am satisfied with the people in my work center.

VIII. Powerlessness: the degree to which organizational members perceive themselves to have control over their work and work station.

Items in Scale:

- 18. Around here it's not important how much you know, it's whom you know that really counts.
- 26. My job gives me a chance to try out ideas of my own.
- 29. I often do things in my work that I wouldn't do if it were up to me.
- 35. I have enough freedom to do my job as I see fit.
- 53. My job allows me to control my own pace.
- 55. I feel pushed on the job.

IX. Meaninglessness: the degree to which organizational members perceive their work role as having a connection and relation to the larger mission of the organization.

Items in Scale:

- 14. My job is so simple that virtually anybody could handle it with little or no initial training.
- 24. On my job, I produce a whole product or perform a complete service.
- 28. I feel that most of the things I do on my job are meaningless.
- 31. The work I do on my job makes a visible impact on a service or a product.
- 52. My job is essential to the success of the plant.

INDIVIDUAL QUESTIONS

Questions about STEP:

- 58. I heard about STEP (Sociotechnical Systems Evaluation Program) before today.
- 59. I understand what STEP is.
- 60. In the last six months, morale in my work center has improved.
- 61. In the last six months, productivity in my work center has increased.
- 62. I would expect productivity in my work center to increase due to STEP.
- 63. I would expect morale in my work center to improve due to STEP.

Perceived levels of productivity in the work center:

- 64. What is your evaluation of the overall productivity of your work center?

Perceived levels of morale in the work center:

- 65. What is your evaluation of the overall morale of your work center?

Demographics:

- 74. Sex
- 75. Length of time worked at Depot.
- 76. Length of time worked at work center.
- 77. Age
- 78. Career Field
- 79.-80. Paygrade and wage classification
- 81. Career Intention
- 82. Educational level
- 83. Ethnic Background

EXHIBIT 2

CORPUS CHRISTI ARMY DEPOT EMPLOYEE  
SURVEY AND DEC 82 RESULTS  
(INCLUDING JUN 83 AND APR 84 DATA)

Note. This exhibit includes 2 copies of the employee survey. The first copy includes comparison data from the JUN 83 and APR 84 administrations of the survey. The second copy shows the responses of supervisors on the employee survey administered in DEC 82. The comparison data are discussed in Formative Evaluations VI and VII.

JUNE 1983

# CORPUS CHRISTI ARMY DEPOT EMPLOYEE SURVEY

Comparison Data for the Three Administrations  
of the Corpus Christi Army Depot Employee Survey

~~NOT TO BE SHOWN TO UNAUTHORIZED PERSONS  
NOT TO BE REPRODUCED IN ANY FORM  
WITHOUT THE SPECIFIC PERMISSION OF THE  
TECHNICAL DIRECTOR, ARMY RESEARCH INSTITUTE  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL  
DEPARTMENT OF THE ARMY~~

**PT 5503c**  
**(ATZI-NCR-MA-83-18)**

LEGEND FOR THE CCAD EMPLOYEE SURVEY


1. First column or row is WAVE 1 date.  
Second column or row is WAVE 2 data.  
Third column or row is WAVE 3 data.

2. Scale values:

Strongly disagree	= 1
Disagree	= 2
Neither agree nor disagree	= 3
Agree	= 4
Strongly agree	= 5

3. Scales

A	Authority
P	Procedural Specification
Mo	Morale
L	Division of Labor
R	Rules
Me	Meaninglessness
Po	Powerlessness
TV	Task Variability
TD	Task Difficulty

4. Double item numbers, e.g. 58/61. First item refers to the number of this item on the WAVE 12 survey.
5.  $\bar{X}$  refers to "average."  
S.D. refers to "standard deviation."
6. Cross-reference to another item in survey, e.g. cf. 20. See this item number on the WAVE 2 survey for a parallel item but with different wording.
7.  Items reverse-scored for scaling purposes.
8. \* Items with editorial changes from WAVE 1.

GENERAL INSTRUCTIONS

Most of the questions ask that you circle one of several numbers that appear on a scale either to the right of the question or below the question. You are to choose one number that best matches the description of how you feel about the question, and circle the number of that description.

EXAMPLE 1:

	<u>Strongly</u> <u>Disagree</u>	<u>Disagree</u>	<u>Neither</u> <u>Agree nor</u> <u>Disagree</u>	<u>Agree</u>	<u>Strongly</u> <u>Agree</u>
I enjoy the weather in this area.	1	2	3	④	5

The same procedure is to be followed if the responses are below the item. Circle the number that best matches the description of how you feel about the item, like this:

EXAMPLE 2:

How satisfied are you with the weather in this area?

1. Very dissatisfied
2. Dissatisfied
3. Neither dissatisfied nor satisfied
- ④. Satisfied
5. Very satisfied

ALL QUESTIONS SHOULD BE ANSWERED DIRECTLY ON THE QUESTIONNAIRE.

ALTHOUGH SOME QUESTIONS WILL SOUND VERY SIMILAR, BE SURE THAT YOU HAVE ANSWERED ALL QUESTIONS.

\*\*\*\*\*



June 1983

CORPUS CHRISTI ARMY DEPOT EMPLOYEE SURVEY

This survey is designed to find out how you and others feel about your work center. Your answers will provide the information needed to understand better how people feel about the quality and nature of working life in their work center at CCAD. This survey will also provide a basis for understanding the changes which occur here during STEP (Sociotechnical Systems Evaluation Program).

If this survey is to be useful, it is very important that you answer each question frankly and honestly. There are no right or wrong answers to these questions, since we are interested in what you think and feel about your life in your work center.

The questions in this survey ask about characteristics of the work center. When answering questions, be sure to choose answers which best describe your work center and the work you do in your work center. WE ARE NOT INTERESTED IN THE DEPOT AS A WHOLE, ONLY YOUR WORK CENTER.

Your answers to these questions are completely confidential. All surveys will be taken to the U.S. Army Research Institute for the Behavioral and Social Sciences in Washington, D.C., for analysis and safekeeping. The completed questionnaires will be processed by computer and the results summarized in statistical form. Your individual responses will remain strictly confidential since they will be combined with those of many other people. Any background information that you list will be used to sort people into large groups and will not be used to identify you personally.

Thank you for your cooperation and assistance. We hope you find the survey interesting.

U.S. ARMY RESEARCH INSTITUTE  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

Percent

Scale	No.	Item	Percent					$\bar{X}$	S.D.
			Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
A	1.	I have to check with the boss before I do almost anything.	13	49	11	23	4	2.5	1.2
			14	51	14	18	2	2.4	1.0
			20	52	12	15	-	2.2	1.0
P	2.	This work center stresses following the established procedures.	2	16	12	61	6	3.5	.9
			4	12	16	59	9	3.6	.9
			4	10	17	59	9	3.6	.9
Mo	3.	All in all, I am satisfied with my work center.	7	16	11	51	14	3.5	1.1
			7	14	13	53	14	3.5	1.1
			6	10	16	53	15	3.6	1.1
L	4.	People working here usually find their jobs monotonous.	7	34	23	31	4	2.9	1.1
			5	36	27	24	8	2.9	1.1
			6	39	30	21	6	2.8	1.0
A	5.	Only persons in management positions can decide how a job should be done.	19	54	10	13	5	2.3	1.1
			18	54	10	13	4	2.3	1.0
			15	56	14	11	3	2.3	1.0
R	⑥.	There are no specific rules * in this work center.	17	59	7	13	3	2.2	1.0
			15	61	11	11	2	2.2	.9
			14	60	15	7	3	2.2	.9
L	⑦.	Most jobs in this work center involve a variety of different kinds of activities.	3	9	7	65	14	3.8	.9
			3	11	6	66	14	3.8	.9
			2	8	8	66	16	3.9	.8
R	8.	The people in this work center * know how they should behave.	4	14	9	64	8	3.6	1.0
			4	8	11	63	14	3.8	.9
			6	8	13	61	13	3.7	1.0
A	⑨.	I feel that I can act as my own boss in most matters.	3	21	11	49	15	3.5	1.1
			4	20	18	45	13	3.4	1.1
			1	21	17	42	18	3.5	1.1
R	10.	It seems as though there is a * rule for everything in this work center.	2	28	14	47	8	3.3	1.0
			3	32	22	37	6	3.1	1.0
			3	38	24	28	6	3.0	1.0
R	⑪.	Nothing is said if I come to * work late occasionally.	21	54	6	14	3	2.2	1.1
			29	48	12	8	3	2.1	1.0
			31	48	10	8	2	2.0	1.0
A	12.	Even small matters have to be referred to some higher-up for a final answer.	7	42	13	30	7	2.9	1.1
			10	47	10	28	5	2.7	1.1
			10	55	12	14	7	2.5	1.1
A	13.	I can take very little action * until a supervisor approves a decision.	5	34	13	42	6	3.1	1.1
			7	43	17	29	4	2.8	1.1
			11	49	13	20	6	2.6	1.1
Me	14.	My job is so simple that * anybody could handle it with little or no training.	43	41	4	7	5	1.9	1.0
			43	42	3	6	6	1.9	1.1
			45	36	6	8	5	1.9	1.1

Scale	No.	Item	Percent					$\bar{X}$	S.D.
			Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
R	15.	My work center has a manual of rules and regulations to be followed.	3 3 3	13 15 11	10 12 13	65 59 67	10 12 6	3.7 3.6 3.6	.9 1.0 .9
P	16.	At times, going through the proper channels becomes more important than getting the work done.	4 3 3	24 27 29	9 8 20	51 40 34	12 12 12	3.4 3.3 3.2	1.1 1.1 1.1
P	17.	Standard procedures are to be followed in almost all situations.	2 2 2	11 8 12	7 11 14	71 72 65	9 9 7	3.7 3.8 3.6	.8 .8 .9
P	18.	In this work center, who you * know counts more than what you know.	5 8 12	14 30 30	12 20 20	33 21 20	35 21 19	3.8 3.2 3.0	1.2 1.3 1.3
Mo	19.	All in all, I am satisfied with my supervisor.	9 9 7	17 10 10	16 18 18	42 50 44	14 13 20	3.3 3.5 3.6	1.2 1.1 1.1
P	20.	I am encouraged to "cut red * tape" in order to get my job done. (cf. 59)	6 7 6	49 46 44	21 26 28	19 18 19	5 3 3	2.7 2.6 2.7	1.0 1.0 .9
A	21.	I get work orders from the same person all the time.	6 6 4	50 50 50	12 18 22	31 24 22	1 1 2	2.7 2.7 2.7	1.0 1.0 .9
R	22.	I feel that I am constantly being watched to see that I obey all the rules.	10 8 14	50 48 49	14 19 21	18 18 11	7 7 5	2.6 2.7 2.5	1.1 1.1 1.0
R	23.	I make my own rules in order * to get my job done.	21 9 8	65 57 60	10 20 21	3 12 9	2 2 1	2.0 2.4 2.3	.7 .9 .8
Me	24.	On my job, I produce a whole product or perform a complete service.	2 1 1	7 7 9	6 6 14	62 64 58	22 22 18	3.9 4.0 3.8	.8 .8 .9
A	25.	I can make my own decisions without checking with anyone else.	9 5 4	31 32 26	21 24 26	34 32 36	5 8 7	3.0 3.1 3.2	1.1 1.1 1.0
Po	26.	My job gives me a chance to try out ideas of my own.	3 5 2	21 18 17	12 18 20	55 52 54	9 8 6	3.5 3.4 3.4	1.0 1.0 .9
L	27.	Most jobs in this work center have something different happening from day to day.	4 3 3	23 23 22	12 14 18	49 48 43	11 12 13	3.4 3.4 3.4	1.1 1.1 1.1

Scale	No.	Item	Percent					$\bar{X}$	S.D.
			Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
Me	28.	I feel that most of the things I do on my job are meaningless.	28	61	4	4	3	1.9	.8
			27	59	9	4	2	1.9	.8
			33	52	8	3	4	1.9	.9
Po	29.	I often do things in my work that I wouldn't do if it were up to me.	10	49	13	26	1	2.6	1.0
			8	49	16	23	4	2.7	1.0
			11	48	17	21	3	2.6	1.0
R	30.	I am expected to follow orders without questioning them.	5	44	13	30	7	2.9	1.1
			5	36	17	37	4	3.0	1.1
			5	40	23	26	5	2.9	1.0
Me	31.	The work I do on my job makes a visible impact on a service or a product.	1	3	4	62	28	4.2	.7
			1	2	4	62	31	4.2	.7
			1	1	6	60	32	4.2	.7
P	32.	"Red tape" is often a problem * in getting my job done.	3	30	15	37	14	3.3	1.1
			4	41	19	27	10	3.0	1.1
			5	38	27	22	8	2.9	1.1
A	33.	People who like to make their * own decisions would become discouraged in this work center.	5	39	19	32	4	2.9	1.0
			4	38	26	27	6	2.9	1.0
			5	40	28	21	6	2.8	1.0
R	34.	I am not allowed to leave my working area without permission.	2	22	8	51	16	3.6	1.0
			4	23	12	49	12	3.4	1.1
			5	27	13	46	9	3.3	1.1
Po	35.	I have enough freedom to do my job as I see fit.	4	28	14	48	6	3.2	1.0
			4	24	20	47	5	3.3	1.0
			4	23	23	44	7	3.3	1.0
L	36.	In this work center there is something new and different to do almost every day.	6	28	15	44	6	3.2	1.1
			4	29	18	42	7	3.2	1.1
			4	24	22	40	9	3.3	1.1
A	37.	Everyone here has one superior to whom he or she reports regularly. (cf. 58)	2	7	6	71	13	3.9	.8
			0	13	9	65	13	3.8	.8
			2	13	12	63	10	3.7	.9
L	38.	I usually work under the same circumstances from day to day.	1	16	6	66	10	3.7	.9
			1	16	12	62	9	3.6	.9
			1	18	15	57	8	3.5	.9
A	39.	How things are done in this work * center is left pretty much up to the person doing the work.	3	40	11	38	7	3.0	1.1
			3	34	16	41	5	3.1	1.0
			5	30	23	36	5	3.1	1.0
Mo	40.	All in all, I am satisfied with my present job.	4	10	13	48	24	4.0	1.0
			4	6	14	55	21	3.8	1.0
			6	6	16	55	17	3.7	1.0
P	41.	Going through the proper channels at all times is constantly stressed.	3	18	18	49	12	3.5	1.0
			1	17	25	49	8	3.5	.9
			3	18	25	48	5	3.3	.9

Percent

Scale	No.	Item	Percent					$\bar{X}$	S.D.
			Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
P	42.	I am left to my own judgment as to how to handle most problems.	2	27	13	51	6	3.4	1.0
			1	25	18	52	4	3.3	.9
			1	25	17	52	4	3.4	.9
L	43.	Each person in my work center has a specific job to do.	3	24	9	55	8	3.4	1.0
			3	20	10	60	8	3.5	1.0
			1	18	15	57	9	3.6	.9
P	44.	Most workers in this work * center are encouraged to use their own judgment in handling everyday situations.	1	18	14	59	6	3.5	.9
			2	18	21	54	5	3.4	.9
			0	22	19	54	4	3.4	.9
L	45.	No two days are ever the same * in my job.	5	30	15	41	9	3.2	1.1
			4	30	15	44	7	3.2	1.1
			5	33	18	37	7	3.1	1.1
Mo	46.	All in all, I am satisfied with the people in my work center.	5	20	9	58	11	3.6	1.0
			5	10	16	58	12	3.6	1.0
			4	11	18	58	9	3.6	.9
A	47.	I can get parts or supplies without clearing it with my supervisor.	8	38	13	37	4	3.0	1.1
			8	31	10	44	7	3.1	1.1
			7	28	14	45	6	3.1	1.1
A	48.	Any decision I make has to have the boss's approval.	4	49	17	24	5	2.8	1.0
			6	47	19	25	3	2.7	1.0
			8	48	23	19	1	2.6	.9
R	49.	I am constantly being watched * for possible rule violations.	8	58	15	15	4	2.5	1.0
			9	47	22	17	5	2.6	1.0
			13	53	20	10	5	2.4	1.0
L	50.	This work center has a complex division of labor. (cf.60)	2	28	26	36	6	3.2	1.0
			3	24	31	38	4	3.1	.9
			4	31	32	30	4	3.0	1.0
P	51.	Whenever I have a problem on the job, I am supposed to go to the same person for an answer.	8	52	10	27	2	2.6	1.0
			7	48	14	29	2	2.7	1.0
			4	49	17	28	1	2.7	1.0
Me	52.	My job is essential to the * success of the work center.	1	2	6	54	36	4.2	.8
			1	3	6	59	32	4.2	.7
			1	1	7	61	29	4.2	.7
Po	53.	My job allows me to control my own work pace.	3	21	13	53	9	3.4	1.0
			4	22	14	53	7	3.4	1.0
			3	19	17	53	8	3.4	1.0
L	54.	Everyone in this work center has a specific function to perform.	3	10	7	68	13	3.8	.9
			2	12	10	63	13	3.7	.9
			-	13	14	63	10	3.7	.8
Po	55.	I feel pushed on the job.	9	52	17	13	8	2.6	1.1
			8	50	19	16	7	2.6	1.1
			7	59	24	6	6	2.4	.9
P	56.	I have to follow strict operating procedures at all times.	3	32	23	36	6	3.1	1.0
			2	31	26	36	5	3.1	1.0
			4	30	31	29	6	3.0	1.0

Percent

Scale	No.	Item	Percent					X	S.D.
			Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
L	57.	One thing I like in this work * center is the variety of work I get to do.	6 4 3	20 15 14	13 13 18	51 55 52	9 14 13	3.4 3.6 3.6	1.1 1.0 1.0
A	58.	Everyone in this work center must report to his or her supervisor on a regular basis. (cf. 37)	-- 2 2	-- 25 28	-- 16 19	-- 49 44	-- 7 6	-- 3.3 3.2	-- 1.0 1.0
P	59.	I am encouraged to cut corners to get my job done. (cf. 20)	-- 10 8	-- 55 59	-- 18 17	-- 15 13	-- 2 2	-- 2.4 2.4	-- .9 .9
L	60.	This work center has many different types of jobs. (cf. 50)	-- 2 2	-- 13 15	-- 10 12	-- 64 58	-- 11 14	-- 3.7 3.7	-- .9 1.0
	58/61.	I heard about STEP (Socio-technical Systems Evaluation Program) before today.	1 3 3	9 12 12	2 3 2	75 69 71	12 13 12	3.9 3.8 3.8	.8 .9 .9
	59/62.	I understand what STEP is.	4 5 5	9 13 9	13 15 15	65 59 64	7 8 7	3.6 3.5 3.6	.9 1.0 .9
	60/63.	In the last six months, * morale in my work center has <u>decreased</u> .	3 6 8	25 32 30	30 28 28	28 22 18	14 12 16	2.8 3.0 3.0	1.1 1.1 1.2
	61/64.	In the last six months, productivity in my work center has <u>increased</u> .	4 7 4	16 15 16	28 31 31	45 39 41	5 8 9	3.3 3.3 3.3	1.0 1.0 1.0
	62/65.	I expect productivity in my * work center to <u>decrease</u> due to STEP.	5 8 11	34 44 45	38 37 29	18 7 8	4 3 7	2.8 2.5 2.6	.9 .9 1.0
	63/66.	I expect morale in my work * center to <u>improve</u> due to STEP.	4 8 12	18 18 15	38 41 30	34 35 34	5 5 9	3.2 3.0 3.1	.9 1.0 1.1
	67.	I like what STEP is trying to do.	3 4	7 3	29 30	51 50	10 13	3.6 3.7	.9 .9
	68.	I like what STEP has done so far.	-- 5 6	-- 13 7	-- 43 45	-- 33 36	-- 5 7	-- 3.2 3.3	-- .9 .9
	69.	I have received new training as a result of STEP.	-- 20 16	-- 43 36	-- 21 23	-- 13 20	-- 3 5	-- 2.4 2.6	-- 1.0 1.1
	70.	I do different work as a result of STEP.	-- 18 15	-- 43 39	-- 25 30	-- 11 14	-- 2 2	-- 2.4 2.5	-- 1.0 1.0
	71.	I work in a different location as a result of STEP.	-- 19 18	-- 50 49	-- 20 22	-- 8 9	-- 3 1	-- 2.3 2.3	-- 1.0 .9

Percent

Scale No.	Item	Strongly		Neither		Strongly		X	S.D.
		Disagree	Disagree	Agree nor	Disagree	Agree	Agree		
72.	Communication in this work center has <u>improved</u> as a result of STEP.	--	--	--	--	--	--	--	--
		15	31	34	18	2	2.6	1.0	
73.	The training resulting from STEP will <u>not change</u> productivity in my work center.	--	--	--	--	--	--	--	--
		4	23	38	29	6	3.1	1.0	
74.	The training resulting from STEP will help <u>improve</u> morale in my work center.	--	--	--	--	--	--	--	--
		11	18	39	27	4	3.0	1.0	
75.	Completeness of kitting and availability of parts has <u>not changed</u> in the last 6 months.	--	--	--	--	--	--	--	--
		2	16	28	41	12	3.4	1.0	
76.	It has become <u>easier</u> to get tools and equipment in the last 6 months.	--	--	--	--	--	--	--	--
		17	40	27	14	2	2.4	1.0	
77.	I would like to work <u>more</u> overtime.	--	--	--	--	--	--	--	--
		5	13	27	34	20	3.5	1.1	
78.	The quality of work in this work center has <u>improved</u> in the last 6 months.	--	--	--	--	--	--	--	--
		6	18	36	35	6	3.2	1.0	
79.	In the last 6 months, absenteeism in this work center has <u>decreased</u> .	--	--	--	--	--	--	--	--
		4	18	55	21	2	3.0	.8	
80.	Turnover in this work center has <u>increased</u> in the last 6 months.	--	--	--	--	--	--	--	--
		5	22	41	27	5	3.0	.9	
		2	19	45	29	4	3.2	.8	

**Directions:** For each of the following questions please circle the number that corresponds to your answer.

Scale				$\bar{X}$	S.D.
64/81.	What is your evaluation of the overall productivity of your work center?			3.5	.9
		$\%$	$\%$	3.4	.9
		$\%$	$\%$	3.4	.9
	1. Not productive	1	3	1	
	2. Slightly productive	9	9	11	
	3. Productive	41	44	45	
	4. Very productive	30	33	32	
	5. Extremely productive	17	12	10	
65/82.	What is your evaluation of the overall morale of your work center?			2.9	1.0
		$\%$	$\%$	2.9	1.0
		$\%$	$\%$	3.0	1.0
	1. Very low morale	12	12	10	
	2. Low morale	17	13	20	
	3. Fair morale	47	51	41	
	4. High morale	19	19	23	
	5. Very high morale	4	5	6	
TV 66/83.	To what extent do you perform the same tasks each day? *			2.7	1.4
		$\%$	$\%$	2.7	1.3
		$\%$	$\%$	2.8	1.3
	1. Almost all my tasks are the same.	24	22	20	
	2. Many of my tasks are the same.	27	26	25	
	3. About half my tasks are the same.	15	17	23	
	4. Some of my tasks are the same.	21	25	18	
	5. Almost no tasks are the same.	13	9	14	
TV 67/84.	How much the same are the day-to-day situations, problems, or issues you encounter in performing your major tasks?			2.2	1.0
		$\%$	$\%$	2.3	1.0
		$\%$	$\%$	2.3	1.0
	1. Very much the same	24	24	20	
	2. Mostly the same	44	44	49	
	3. Quite a bit different	18	20	20	
	4. Very much different	8	6	8	
	5. Completely different	4	5	4	
TV 68/85.	During a normal week, how frequently do exceptions arise in your work tasks which require very different methods or procedures for doing it?			2.2	1.0
		$\%$	$\%$	2.1	.9
		$\%$	$\%$	2.2	1.0
	1. Very rarely	21	25	25	
	2. Occasionally	52	52	46	
	3. Quite often	15	16	20	
	4. Very often	8	5	5	
	5. Constantly	3	3	4	



Scale				$\bar{X}$	S.D.	
TV	69/86.	How often do you follow about the same work methods or steps for doing your major tasks from day to day?			3.8	1.2
		$\frac{\%}{7}$	$\frac{\%}{6}$	$\frac{\%}{3}$	3.8	1.0
	1. Very seldom	9	7	7	3.9	1.0
	2. Sometimes	8	13	15		
	3. About half the time	44	47	46		
	4. Quite often	31	27	29		
	5. Very often					
TD	70/87.	How easy is it for you to know whether you do your work tasks correctly?			4.2	.9
		$\frac{\%}{1}$	$\frac{\%}{1}$	$\frac{\%}{1}$	4.1	.9
	1. Very difficult	5	5	1	4.1	.9
	2. Quite difficult	16	18	22		
	3. Somewhat easy	34	37	40		
	4. Quite easy	45	39	35		
	5. Very easy					
TD	71/88.	What percent of the time are you sure of what the outcomes * of your work will be?			4.6	.9
		$\frac{\%}{3}$	$\frac{\%}{2}$	$\frac{\%}{2}$	4.5	.9
	1. 0-20%	2	2	0	4.5	.9
	2. 21-40%	5	5	10		
	3. 41-60%	19	20	23		
	4. 61-80%	72	70	65		
	5. 81-100%					
TD	72/89.	In the past 3 months, about how often did difficult problems * arise in your work for which there were no immediate or apparent solutions?			1.3	.8
		$\frac{\%}{77}$	$\frac{\%}{85}$	$\frac{\%}{82}$	1.3	.7
	1. Once a week or less	12	9	11	1.3	.7
	2. 2-4 times a week	3	2	5		
	3. Once a day	3	2	2		
	4. 2-4 times a day	1	2	--		
	5. 5 or more times a day					
TD	73/90.	About how much time did you spend solving these work problems? *			1.9	1.1
		$\frac{\%}{48}$	$\frac{\%}{54}$	$\frac{\%}{52}$	1.8	1.7
	1. Less than 1 hour a week	26	26	25	1.9	1.2
	2. 1-4 hours a week	11	10	12		
	3. 1 hour a day	7	6	6		
	4. 2-3 hours a day	4	5	5		
	5. 4 or more hours a day					
	91. My work center contains a new Work Leader (Verifier) position.	$\frac{\%}{--}$	$\frac{\%}{51}$	$\frac{\%}{43}$		
	1. Yes	--	49	56		
	2. No					

Scale

92.	This position has helped increase productivity in my work center.							
		$\frac{\%}{--}$	$\frac{\%}{26}$	$\frac{\%}{29}$				
	1. Yes	--	26	29				
	2. No	--	32	24				
	3. My work center does not have a Work Leader (Verifier) position	--	42	47				
93.	My work center contains a new WG-2 worker to move aircraft and perform general cleanup.							
		$\frac{\%}{--}$	$\frac{\%}{27}$	$\frac{\%}{7}$				
	1. Yes	--	27	7				
	2. No	--	73	93				
94.	This worker has helped to increase productivity in my work center.							
		$\frac{\%}{--}$	$\frac{\%}{22}$	$\frac{\%}{8}$				
	1. Yes	--	22	8				
	2. No	--	21	16	$\frac{\%}{--}$	$\frac{\%}{57}$	$\frac{\%}{76}$	
	3. My work center does not have these workers	--						
95.	My work center was <u>directly</u> involved in the reorganization due to STEP.							
		$\frac{\%}{--}$	$\frac{\%}{39}$	$\frac{\%}{33}$				
	1. Yes	--	39	33				
	2. No	--	61	67				
96.	The reorganization of my work center has increased the productivity in my work center.							
		$\frac{\%}{--}$	$\frac{\%}{28}$	$\frac{\%}{27}$				
	1. Yes	--	28	27				
	2. No	--	31	27	$\frac{\%}{--}$	$\frac{\%}{47}$		
	3. My work center was not involved in the reorganization	--						
74/97/	What is your sex?							
103		$\frac{\%}{97}$	$\frac{\%}{91}$	$\frac{\%}{95}$				
	1. Male	97	91	95				
	2. Female	3	9	5				
75/98/	How long have you worked at this <u>Depot</u> ?							
104		$\frac{\%}{9}$	$\frac{\%}{20}$	$\frac{\%}{13}$	$\frac{\%}{26}$	$\frac{\%}{18}$	$\frac{\%}{9}$	
	1. Less than 1 year	9	20	13	4. 11-15 years	26	18	9
	2. 1-5 years	16	18	31	5. 16-20 years	24	24	28
	3. 6-10 years	15	12	8	6. More than 20 years	10	8	12
76/99/	How long have you worked in this <u>work center</u> ?							
105		$\frac{\%}{17}$	$\frac{\%}{32}$	$\frac{\%}{25}$	$\frac{\%}{11}$	$\frac{\%}{12}$	$\frac{\%}{9}$	
	1. Less than 1 year	17	32	25	4. 11-15 years	11	12	9
	2. 1-5 years	35	30	45	5. 16-20 years	9	6	7
	3. 6-10 years	24	18	11	6. More than 20 years	3	2	3

Scale		$\bar{X}$	S.D.		
77/100/	How old were you on your last birthday?	42.0	10.8		
106		40.7	11.3		
	_____ years old	42.3	10.3		
78/101/	What is your job title? (e.g., laborer, A/C mechanic, *				
107	heat treater, plastic worker) _____				
79/80/102/	What is your pay-grade and wage classification? (e.g., WG *				
108	5, GS 10, WT 3) _____				
81/103/	Which of the following best describes your career intentions				
110	at the present time?			<u>%</u>	<u>%</u>
	1. I will definitely stay until retirement			67	59
	2. I will probably stay until retirement			21	25
	3. Undecided			7	8
	4. I will stay for now but will probably leave before retirement			2	4
	5. I will definitely leave at the earliest opportunity			1	4
					3
82/104/	What is your education level (indicate highest level completed)?			<u>%</u>	<u>%</u>
111					<u>%</u>
	1. Did not finish high school			13	11
	2. High school graduate or G.E.D.			30	32
	3. Some college or technical training beyond high school (1-3 years)			50	53
	4. Graduated from college (B.A., B.S., or other Bachelor's degree)			2	3
	5. Some graduate school			2	5
	6. Graduate degree (Master's, Ph.D., M.D., etc.)			0	0
					0
83/105/	What is your ethnic background?			<u>%</u>	<u>%</u>
112					<u>%</u>
	1. Anglo	29	30	37	
	2. Black	4	4	3	
	3. Hispanic	62	62	59	
	4. American Indian	1	1	1	
	5. Other (please specify)	1	3	2	
84/106/	Are you <u>officially</u> a supervisor or an acting supervisor? *				
109				<u>%</u>	<u>%</u>
	1. Yes	13	7		
	2. No	87	93		
85/107/	What is the name of your work center? _____				
113					
86/108/	What is the identification number of your work center?				
114	(e.g., 5DB1A) _____				

Scale

87/109/ What is your social security number? \_\_\_\_\_  
115

110/ Did you participate in the first administration of this  
116 survey 6 months ago (December 1982)?

	<u>%</u>	<u>%</u>	<u>%</u>
1. Yes	--	51	60
2. No	--	49	41

111/ Who is your immediate supervisor? \_\_\_\_\_  
117 (This will help verify which work center or line you are in.)

---

In the space below, write any additional comments, questions, suggestions, complaints, etc. that you might have about your work or this project.

EXHIBIT 2 (continued)

# CORPUS CHRISTI ARMY DEPOT

## EMPLOYEE SURVEY

(SUPERVISOR SAMPLE)

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TECHNICAL DIRECTOR, ARMY RESEARCH INSTITUTE  
FOR THE BEHAVIORAL AND SOCIAL SCIENCES  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL  
DEPARTMENT OF THE ARMY~~

PT 5503a  
(ATZI-NCR-MA-82-40A)

	PERCENT RESPONSE					$\bar{X}$	S.D.
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
1. I have to check with the boss before I do almost anything.	33	51	8	8	--	1.9	.6
2. The organization stresses following the established procedures.	3	5	13	62	16	3.8	.9
3. All in all, I am satisfied with my work center.	5	8	3	59	26	3.9	1.0
4. People working here usually find their jobs monotonous.	13	49	15	21	--	2.4	1.0
5. Only persons in management positions can decide how a job should be done.	31	54	3	8	5	2.0	1.1
6. There really are no specific rules in this work center.	23	64	3	8	--	2.0	.9
7. Most jobs in this work center involve a variety of different kinds of activities.	--	3	8	74	15	4.0	.6
8. The people in this work center understand how they should act.	--	3	18	59	18	4.0	.7
9. I feel that I can act as my own boss in most matters.	3	23	8	59	8	3.5	1.0
10. It seems as though there is a rule for everything here.	3	28	21	44	3	3.2	1.0
11. Nothing is said if you come to work late occasionally.	23	62	3	13	--	2.1	.9
12. Even small matters have to be referred to some higher-up for a final answer.	21	54	10	13	3	2.2	1.0
13. There can be little action until a supervisor approves a decision.	13	46	10	28	3	2.6	1.1
14. My job is so simple that virtually anybody could handle it with little or no initial training.	49	36	5	5	5	1.8	1.1

	PERCENT RESPONSE					$\bar{X}$	S.D.
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
15. My work center has a manual of rules and regulations to be followed.	--	10	5	64	18	3.9	.8
16. At times, going through the proper channels becomes more important than getting the work done.	10	36	15	28	10	2.9	1.2
17. Standard procedures are to be followed in almost all situations.	--	21	8	56	15	3.7	1.0
18. Around here it's not important how much you know, it's whom you know that really counts.	13	33	8	31	13	3.0	1.3
19. All in all, I am satisfied with my supervisor.	5	13	15	51	15	3.6	1.1
20. I am encouraged to "cut red tape" in order to get the job done.	3	39	21	33	5	3.0	1.0
21. I get work orders from the same person all the time.	3	56	13	23	5	2.7	1.0
22. I feel that I am constantly being watched to see that I obey all the rules.	15	54	21	10	--	2.3	.9
23. I make my own rules on the job.	15	62	15	3	5	2.2	.9
24. On my job, I produce a whole product or perform a complete service.	5	18	18	39	15	3.4	1.1
25. I can make my own decisions without checking with anyone else.	--	36	26	36	7	3.1	.9
26. My job gives me a chance to try out ideas of my own.	--	18	13	62	8	3.6	.9
27. Most jobs in this work center have something different happening from day to day.	3	13	13	68	5	3.6	.9

	PERCENT RESPONSE					$\bar{X}$	S.D.
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
28. I feel that most of the things I do on my job are meaningless.	18	67	13	--	--	2.0	.6
29. I often do things in my work that I wouldn't do if it were up to me.	13	49	5	29	--	2.5	1.1
30. I am expected to follow orders without questioning them.	8	39	23	23	5	2.8	1.1
31. The work I do on my job makes a visible impact on a service or a product.	3	5	8	56	26	4.0	.9
32. Red tape is often a problem in getting a job done.	--	26	13	39	15	3.5	1.1
33. People who like to make their own decisions would become discouraged here.	5	54	15	21	3	3.0	1.0
34. I am not allowed to leave my working area without permission.	10	44	10	31	3	2.7	1.1
35. I have enough freedom to do my job as I see fit.	--	28	18	44	8	3.3	1.0
36. In this work center there is something new and different to do almost every day.	--	33	10	46	8	3.3	1.0
37. Everyone here has one superior to whom he or she reports regularly.	3	18	5	62	10	3.6	1.0
38. I usually work under the same circumstances from day to day.	8	18	23	44	5	3.2	1.1
39. How things are done around here is left pretty much up to the persons doing the work.	3	41	18	33	3	3.0	1.0
40. All in all, I am satisfied with my present job.	--	13	10	46	26	4.0	1.0
41. Going through the proper channels at all times is constantly stressed.	--	18	18	49	10	3.5	.9



	PERCENT RESPONSE					$\bar{X}$	S.D.
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
42. I am left to my own judgment as to how to handle most problems.	3	18	3	69	5	3.6	.9
43. Each person in my work center has a specific job to do.	--	15	5	64	13	3.8	.9
44. Most of us are encouraged to use our own judgment in handling everyday situations.	--	10	8	72	8	3.8	.7
45. No two days are ever the same in this job.	5	26	21	39	8	3.2	1.1
46. All in all, I am satisfied with the people in my work center.	--	--	10	69	18	4.1	.5
47. I can get supplies without clearing it with my superior.	--	26	5	49	18	3.6	1.1
48. Any decision I make has to have the boss's approval.	13	69	5	8	3	2.2	.9
49. I am constantly being checked up on for rule violations.	13	62	8	13	2	2.3	1.0
50. This work center has a complex division of labor.	8	39	10	41	--	2.9	1.1
51. Whenever I have a problem on the job I am supposed to go to the same person for an answer.	8	51	18	18	3	2.6	1.0
52. My job is essential to the success of the plant.	3	5	8	51	31	4.1	.9
53. My job allows me to control my own work pace.	5	18	13	54	8	3.4	1.1
54. Everyone in this work center has a specific function which he or she has to perform.	3	8	5	67	13	3.8	.9
55. I feel pushed on the job.	5	54	23	10	5	2.6	1.0
56. I have to follow strict operating procedures at all times.	3	39	26	28	3	2.9	1.0

	PERCENT RESPONSE					$\bar{X}$	S.D.
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree		
57. One thing people like around here is the variety of work they get to do.	3	10	23	56	8	3.6	.9
58. I heard about STEP (Socio-technical Systems Evaluation Program) before today.	3	5	3	62	26	4.1	.9
59. I understand what STEP is.	--	13	10	64	13	3.8	.8
60. In the last six months, morale in my work center has improved.	5	15	23	44	13	3.4	1.1
61. In the last six months, productivity in my work center has increased.	3	10	15	56	13	3.7	.9
62. I would expect productivity in my work center to increase due to STEP.	3	15	21	46	10	3.5	1.0
63. I would expect morale in my work center to improve due to STEP.	5	15	15	46	13	3.5	1.1

Directions: For each of the following questions please circle the number that corresponds to your answer.

		$\bar{X}$	S.D.
64.	What is your evaluation of the overall productivity of your work center? $\frac{\%}{}$ -- 1. Not productive -- 2. Slightly productive 23 3. Productive 64 4. Very productive 10 5. Extremely productive	3.9	.6
65.	What is your evaluation of the overall morale of your work center? $\frac{\%}{}$ 3 1. Very low morale -- 2. Low morale 33 3. Fair morale 54 4. High morale 10 5. Very high morale	3.7	.8
66.	To what extent do you perform the same tasks from day to day? $\frac{\%}{}$ 8 1. Almost all my tasks are the same day-to-day. 33 2. Many of my tasks are the same day-to-day. 13 3. About half my tasks are the same day-to-day. 41 4. Some of my tasks are the same day-to-day. 5 5. Almost no tasks are the same day-to-day.	3.0	1.1
67.	How much the same are the day-to-day situations, problems, or issues you encounter in performing your major tasks? $\frac{\%}{}$ 18 1. Very much the same 41 2. Mostly the same 23 3. Quite a bit different 10 4. Very much different 8 5. Completely different	2.5	1.1
68.	During a normal week, how frequently do exceptions arise in your work tasks which require very different methods or procedures for doing it? $\frac{\%}{}$ 15 1. Very rarely 59 2. Occasionally 21 3. Quite often 5 4. Very often -- 5. Constantly	2.2	.7

		$\bar{X}$	S.D.
69.	How often do you follow about the same work methods or steps for doing your major tasks from day to day?	3.6	1.3
	$\frac{\%}{10}$ 1. Very seldom		
	10 2. Sometimes		
	18 3. About half the time		
	36 4. Quite often		
	26 5. Very often		
70.	How easy is it for you to know whether you do your work tasks correctly?	3.9	.9
	$\frac{\%}{--}$ 1. Very difficult		
	8 2. Quite difficult		
	21 3. Somewhat easy		
	46 4. Quite easy		
	26 5. Very easy		
71.	What percent of the time are you generally sure of what the outcomes of your work efforts will be?	4.6	.7
	$\frac{\%}{--}$ 1. 0-20%		
	3 2. 21-40%		
	5 3. 41-60%		
	26 4. 61-80%		
	67 5. 81-100%		
72.	In the past 3 months, how often did difficult problems arise in your work for which there were no immediate or apparent solutions?	1.6	1.1
	$\frac{\%}{69}$ 1. Once a week or less		
	15 2. About 2-4 times a week		
	3 3. About once a day		
	5 4. About 2-4 times a day		
	5 5. 5 times or more a day		
73.	About how much time did you spend solving these work problems?	2.3	1.3
	$\frac{\%}{31}$ 1. Less than 1 hour per week		
	39 2. About 1-4 hours per week		
	13 3. About 1 hour per day		
	8 4. About 2-3 hours per day		
	10 5. 4 hours or more per day		

Exhibit 3

Means and Standard Deviations of  
Scales for Employees and Supervisors

Scale	N=271		N=39		N=310	
	Employees X	SD	Supervisors X	SD	Total Sample X	SD
Hierarchy of Authority	2.88	.44	2.67	.44	2.84	.45
Procedural Specification	3.17	.38	3.04	.46	3.15	.39
Presence of Rules	3.16	.42	3.12	.41	3.15	.42
Division of Labor	3.01	.47	2.96	.40	2.98	.46
Morale	3.55	.85	3.90	.74	3.58	.84
Alienation	2.39	.43	2.40	.42	2.35	.55
a. Powerlessness	2.81	.60	2.60	.64	2.79	.59
b. Meaninglessness	1.90	.50	2.04	.55	1.91	.51
Task Variability	2.33	.77	2.53	.68	2.35	.76
Task Difficulty	1.62	.59	1.83	.56	1.65	.59

Exhibit 4

Demographic Characteristics of Supervisors and  
Employees Who Completed the Survey

	Supervisors		Employees	
	%	(N)	%	(N)
<u>Sex</u>				
Male	97.4	(38)	91.9	(249)
Female	2.6	(1)	6.6	(18)
<u>Length of Time Worked at Depot</u>				
less than 1 year	--		8.9	(24)
1-5 years	--		15.5	(42)
6-10 years	10.3	(4)	14.8	(40)
11-15	7.7	(3)	25.5	(69)
16-20	53.8	(21)	23.6	(64)
more than 20 years	28.2	(11)	10.3	(28)
<u>Length of Time Worked at Work Center</u>				
less than 1 year	7.7	(3)	16.6	(45)
1-5 years	48.7	(19)	35.1	(95)
6-10 years	12.8	(5)	23.6	(64)
11-15 years	10.3	(4)	11.4	(31)
16-20 years	15.4	(6)	8.5	(23)
more than 20 years	5.1	(2)	3.3	(9)
<u>Age</u>				
0-20 years	2.6	(1)	2.6	(7)
21-30 years	2.6	(1)	14.8	(40)
31-40 years	15.4	(6)	41.0	(111)
41-50 years	30.8	(12)	17.7	(48)
51-60 years	43.6	(17)	18.5	(50)
more than 60 years	5.1	(2)	5.5	(15)
<u>Career Intentions</u>				
I will definitely stay until retirement.	76.9	(30)	67.2	(182)
I will probably stay until retirement.	7.7	(3)	21.0	(57)
Undecided	10.3	(4)	7.4	(20)
I will stay for now but probably leave before retirement.	2.6	(1)	2.2	(6)
I will definitely leave at the earliest opportunity.	2.6	(1)	.7	(2)

(continued)

Exhibit 4 (continued)  
 Demographic Characteristics of Supervisors and  
 Employees Who Completed the Survey

	Supervisors		Employees	
	%	(N)	%	(N)
<u>Education Level</u>				
Did not finish high school	5.1	(2)	13.3	(36)
Graduated from high school or G.E.D	33.3	(13)	29.9	(81)
Some college or technical training beyond high school	59.0	(23)	49.4	(134)
Graduated from college	--		1.5	(4)
Some graduate school	--		1.5	(4)
<u>Race or Ethnic Background</u>				
Anglo	46.2	(18)	28.8	(78)
Black	7.7	(3)	4.4	(123)
Hispanic	43.6	(17)	62.4	(169)
American Indian	--		.7	(2)
Other	--		1.1	(3)

APPENDIX C

HANDWRITTEN COMMENTS ON THE CORPUS CHRISTI  
ARMY DEPOT EMPLOYEE SURVEY  
(DEC 82)

1. I would also like to say that the system for promotion at this Depot is not very good. I think there is a lot of discrimination and favoritism when supervisors make final selection. I would like to see the eradication for dead end shops, such as the one I work in.
  2. Hangar 43 would be a more pleasant place to work in if we had:
    1. More electrical outlets that worked
    2. More fans that worked (in summer)
    3. Heaters that worked in winter
    4. Doors that were weather stripped to keep out the north wind
    5. Rest rooms with HOT running water to wash dirty hands.
  3. I know the Colonel is aware of some of the problems with the apprentice class here at CCAD and is trying to improve it. The more effort that is put into improving this course the better it will be for future apprentice classes and for the Depot.
  4. The problem is not the people on the Depot. It is personnel that is stopping the people from doing their job. Let the people have a say in things in the shops that they work for and the job will be done right! Let the people in the shop vote for upper levels in the shop, and the job will get done.
  5. I, as an employee, feel that supervisors should take an interest in the work that is performed by each of his employees. By this I mean that a supervisor should give recognition to an employee who performs his work in a well organized manner. By recognition I mean such things as: SSPAs, Outstanding Performance Awards. We as employers are under the impression that all these awards programs have been terminated in our section until we read the monthly paper and we read the names of other employees who get awards. We feel that if awards were issued properly in our work center, our morale would be higher. Employees would really put out 110% to try to get an award or recognition. Employees would go that extra mile just to try to get awarded for their efforts.
  6. Referring to the weather. It is not the weather outside, but in this work center. We feel that we need a new building because of exertion in summer, and no air conditioning. We feel we need more air conditioning than any other shop at CCAD.
- Question #18. In my work center we have some people who get away with anything, no experience, lazy, file discrimination, and still get promoted.



Question #5. It seems that we have no say here.

Question #12. Some supervisors are not qualified for their position, even top management.

Question #41. Even management doesn't have the answers.

Question #55. Too much is expected of some people. Even if someone else is not doing their job, the Crew Chief gets blamed, and this is not a one man job.

Question #59. Even if I do, nothing will be accomplished.

Question #84. My intentions after I graduate from the apprentice program is to be a supervisor and get this place running the way it should.

We constantly have a parts shortage.

7. We have a great need for better supervisors here at CCAD. WE also need better training and more motivation. We need WG-7 and WG-9 who can teach. The WG-7s and WG-9s who have worked here a while don't care and won't teach new people. The supervisors here at CCAD don't care as long as they are being paid.

There is also a need to break the routine the employees get into. This might be done either through cross-training in other shops or through a complete rotation in shop jobs.

8. Question #46. Some people do not pull 100% when you pull more.

Question #62. Productivity would increase if some of the people get off their ----- and would work. The government is spending money for nothing on some of the people here.

Question #63. I wish I could take a test or have some [chance to show] what I can do to get to the next step. Some people get a step higher even though they do not know.

9. Some of my answers won't mean very much, I have been at [this] Depot 2 weeks.

Daily I see qualified people put into work centers where their experience, skills and knowledges are never used.

I have detected a certain amount of apathy in the tool room. Some of the people working there are very slow and could apparently care less if you got the tools needed to do the job properly. And they always seem to be out of what you need.

With (\*) years experience in aircraft maintenance and quality control, I do not intend to stay in the work center I am in any longer than it takes to get back into either maintenance or quality control.

10. I live about 55 miles from work and there are times when I am told that we will be working overtime and I drive my car instead of carpooling. Then, at the very last minute, they cut the overtime and I end up spending gas money instead of earning it. This happens quite often.

11. I would like to see something done about the guy who works with real dedication everyday and the ones who like to waste time. There are often times when a person has to carry someone in the shop and comes up with hours left so the one who was goofing off can account for some extra time. It seems the supervisors don't have too much say-so. The worker still does what he wants.

12. To Whom this may concern:

I feel too much emphasis is stressed upon productivity in this center. One knows the importance of being competitive, for I have also labored on the outside before Civil Service. I know my effort or how hard I must labor in order to keep my job. Make no mistake, I love my job.

What ails my carcass, is the way management has power.  
The Union is worthless - and so are the rights of any man.

Let's try and forget productivity for a little while and concentrate on the rights of the employee. We the employee(s) are the ones that have his Depot where it is today.

13. I firmly know that the promotion procedures here do need to be changed, because a hard working person does not advance in pay or grade as well as he or she should. I think this is a problem that needs attention.

14. I believe that if a survey is taken, no smoking should be observed in the room, and also CCAD meetings (shop, safety, etc.). I am offended by sitting next to a smoker!

15. I have not seen the full effect or changes that the STEP program is supposed to implement.

I am sure that the results of the program will have a significant impact on the work centers' product output and the overall employees' morale at the work center.

With a few refinements, the STEP program will eventually take effect on the whole workforce's attitude and productivity will be on the upswing.

16. Question #83. Item 3. How did the "Hispanic" classification come about? Over 95% of the people I know disagree with it.

17. Remarks: Why don't we have any heaters where I work? It's too cold.

18. I disagree with promoting people because of ethnic background, discrimination because of color, race, sex, etc. Promote because the person merits that position.

Do not promote because of favoritism.

Give jobs to people who can do the job.

19. I don't think this program (STEP) will make any difference, but I hope it will.

We need to see that the best qualified people are moved into the right positions, so that we can get the support we require.

20. My job at CCAD is the best job I ever had. I enjoy my job, but I think the supervisors have a little too much power under their belts. They are at the point where they're just about demanding you work overtime.

There is no appreciation for the work you do.

21. This survey is not going to change anything. Everything is going to go on as it always has.

22. We need more QC work leader personnel to speed up the operation for this Depot.

23. Question #15. Commanders Guidance Bulletins and Rules Governing Conduct and Behavior of employees are available, but many people never read. If they do, they never understand them.

Question #22. There are several people in the management chain, above the shop supervisor, who are mentally unable to cope with people situations of any kind that do not totally agree with their personal views. They are unable to separate their personal prejudices from business.

24. I would like to make a few comments: Several fellow workers would appreciate it, and would feel much better about their work upon completion, if they were congratulated on their fine work. This is not done in our shop. I think that our morale would increase greatly if we all had "a pat on the back" when it is deserved.

---

Note. All comments are slightly edited to enhance readability. More significant changes are indicated by brackets, i.e., [ ]. An asterisk (\*) is used to denote the deletion of information that might violate the confidential nature of the response.

APPENDIX D

HANDOUT FOR THE JUNE 1983  
IN-PROCESS REVIEW

STEP In-Process Review

Agenda

<u>Action Item</u>	<u>Presenter</u>
PSA Changes	Jakie Santillano
Forecasting Changes	Errol Herwig
Production Control Changes	Tom Wilkins
ASTORS Changes	Adolfo Moreno
ASTORS Rotational Training for Mechanics	Adolfo Moreno
Airframe Shop Realignment	Mike Ramirez
Maintenance Verifier (Work Leader)	Mike Ramirez
Assembly Line Aircraft Movement and Clean-up	Mike Ramirez
Hardware Carousel	Peggy Thompson
Streamlining of Aircraft Flow	Scott Sanson
Reduction of Dead End Jobs	Horace Combest
Supervisory Understudy Positions	Mary Martinez
Mechanic Certification (Performance Testing)	Mary Martinez
Directives to Underscore Depot Philosophy	Sandra Strub
Supervisory/Management Training	Sandra Strub
Team Building, Inter-Team Relations, Conflict Management, Communication, and Counseling Training	Dyanna Scarlett
Role Identification Training	Charles Pressley
STEP Measurement Indicators	Dr. Paul vanPelt
Quality-Productivity Ratios	Ed Connell
Present and Future Role of the SDC	Harold Sinnacher

STEP IPR - 16 JUNE 1983

1. Progress

Airframe Preshop Analysis Branch assigned to Maintenance Quality Control Division effective 16 January 1983.

2. Milestone(s)

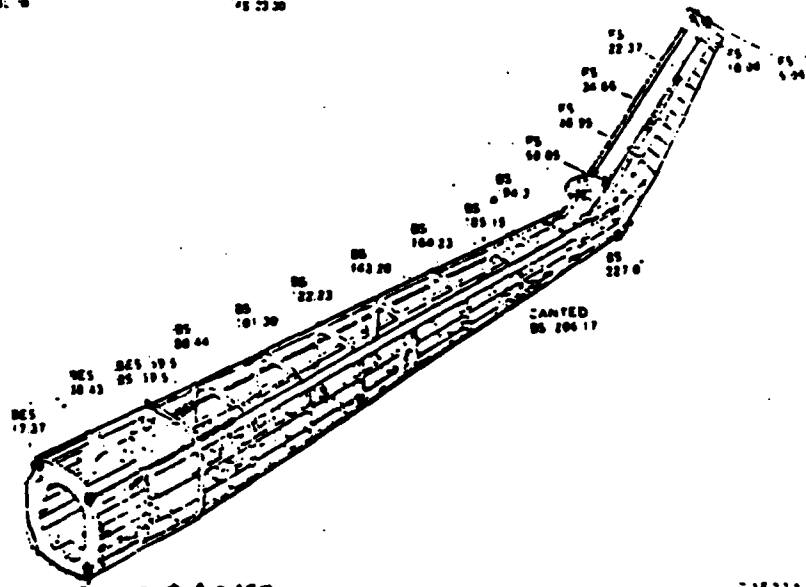
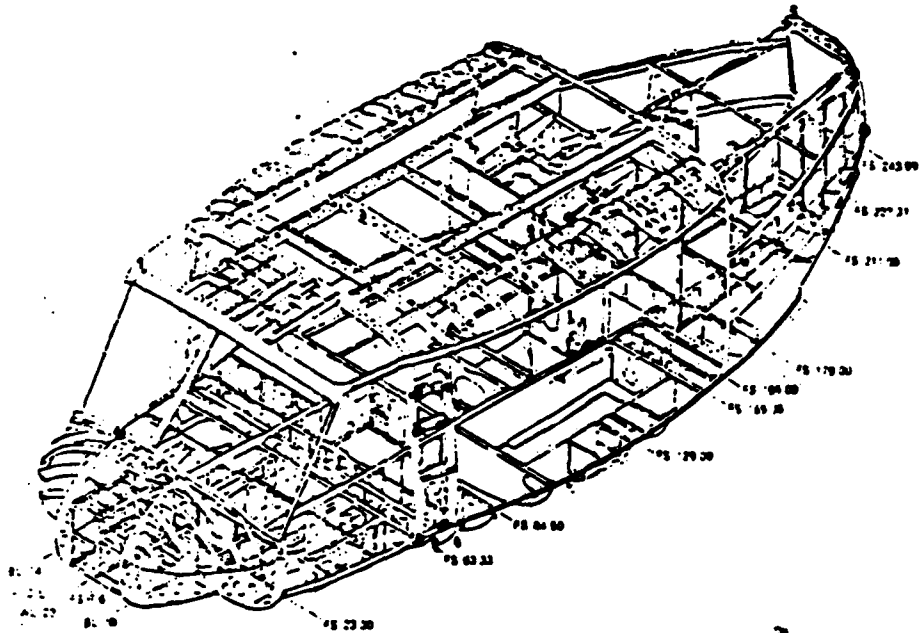
Completed

3. Problems

None

4. Feedback

- a. All comments expressed have been positive.
- b. No known controversial situations between PSA and QC since implementation.
- c. PSA Branch Chief attends weekly Maintenance Quality Control Branch Chiefs' Meetings.
- d. Open discussions pertaining to Production/Quality programs, progress, schedules.
- e. O/T usage requirements reduced with filling of vacancy positions and/or detail of QC Inspectors to PSA duties if necessary.
- f. Better communications between PSA Evaluators, QC Inspectors and Maintenance personnel.



- CRACKS
- CORROSION
- MISSING OR LOOSE PARTS

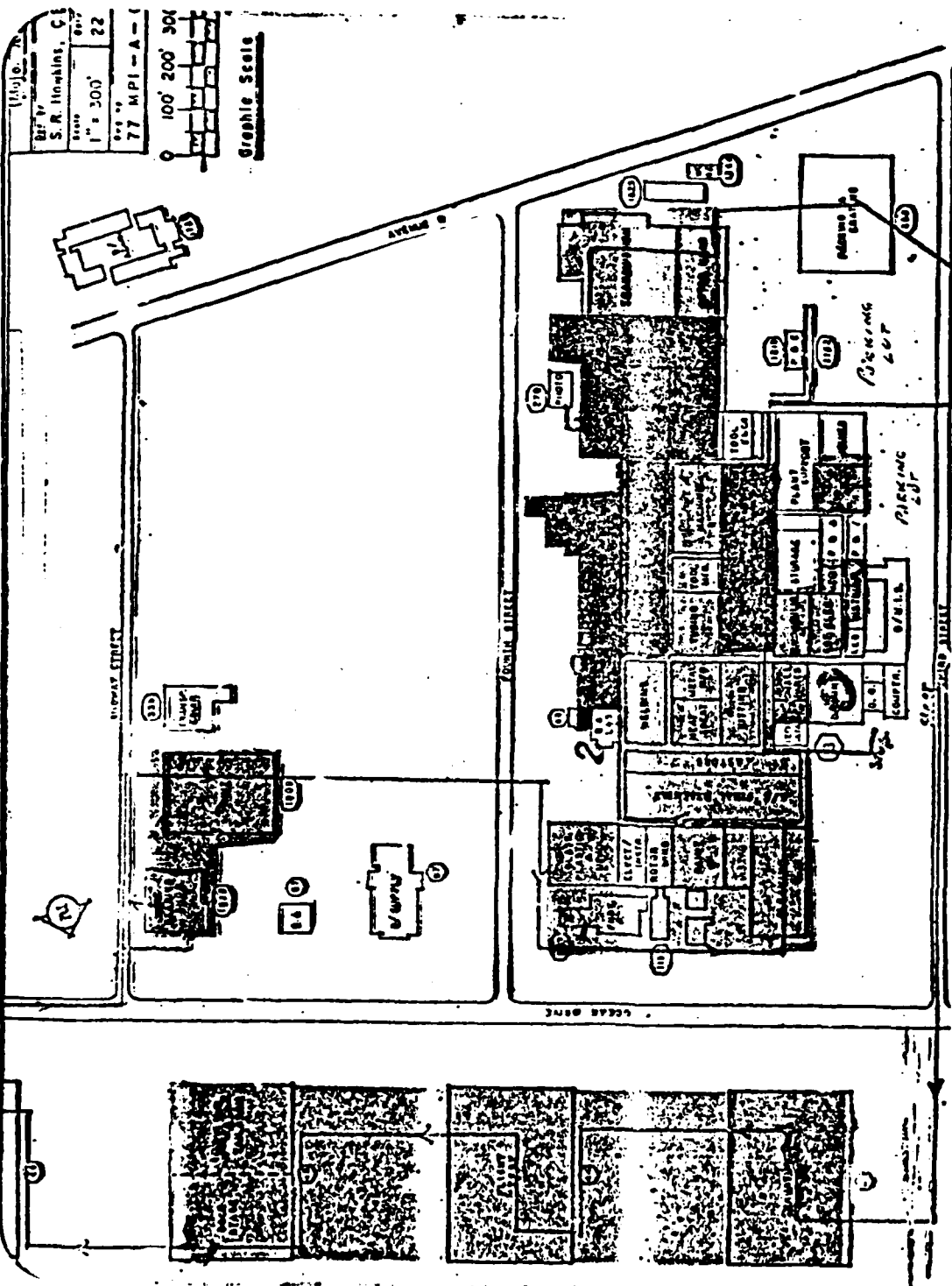
Figure 2.2. Fuselage Structure

S T E P I P R - 16 JUN 83

PPC FORECASTING FUNCTION TO DIRECTORATE FOR SUPPLY

- PROGRESS - 8 VACANT POSITIONS WERE TRANSFERRED  
3 SUPERVISORY POSITIONS NOT FILLED TO-DATE  
43 MRL REVIEWS COMPLETED -  
NAVY IPR PROCEDURES BEING CHANGED  
APPROXIMATELY 65% OF DML SCRUB COMPLETED  
- DIRECT LINK CLOSE PROXIMITY TO PRODUCTION CONTROLLERS  
- SUPPLY ROLE CHANGED FROM PASSIVE TO ACTIVE
- MILESTONE - SUPERVISORY REFERRAL LIST TO BE ISSUED, 20 JUN 83  
- COMPLETE SCRUB OF ALL PARTS SHORTAGES ON NAVY PROGRAMS  
COORDINATED AND IMPACT TO SCHEDULES IDENTIFIED PRIOR  
TO AUGUST IPR  
- TARGET TO COMPLETE SCRUB OF 40,000 DML LINE ITEMS JULY 31
- PROBLEMS - VACANT SUPERVISORY POSITIONS HAVE SERIOUSLY DELAYED ALL  
ANTICIPATED CHANGES/IMPROVEMENTS!  
- NO AVAILABLE SPACE FOR ENGINE FORECASTERS
- FEEDBACK - FORECASTERS SAY, "WE'RE TOLD WE WORK FOR SUPPLY - BUT  
IT'S BUSINESS AS USUAL - WE FELL LIKE STEP CHILDREN"  
- ITEM MANAGERS SAY WE ARE GETTING MUCH BETTER RESPONSE  
FROM FORECASTERS  
- TSARCOM MATERIEL MANAGEMENT VISIBLY IMPRESSED AND BETTER  
ABLE TO BUY SUFFICIENT QUANTITIES OF REPAIR PARTS  
- OTHER ACTIVITIES EXPLORING ADVANTAGES OF FORECAST MOVE
- RECOMMENDATIONS - PRIORITY BE GIVEN TO FILLING THE THREE VACANT SUPER-  
VISOR SPACES  
PRIORITY BE GIVEN TO LOCATE ENGINE FORECASTERS ON  
MEZZ #7





STEP IPR 26 JUNE 1983

PRODUCTION CONTROL CHANGES

PROGRESS

1. PRODUCTION CONTROL TO PP&C DIVISION
2. GS-09 PRODUCTION CONTROLLERS COORDINATING SCHEDULES
3. GS-08 PRODUCTION CONTROLLERS WORKLOADING SHOP
4. RECRUITMENT/PLACEMENT COMPLETED
5. PARTS EXPEDITERS ASSIGNED TO ALL AREAS
6. ASSIGNMENTS, ROLES AND JOB PERFORMANCE STANDARDS COMPLETED
7. TRAINING FOR ALL PERSONNEL ON-GOING

MILESTONES

1. TURN-IN ALL IDENTIFIED EXCESSES TO DIR, SUPPLY: 30 SEP 83
2. CENTRALIZE ALL REQUISITIONING ACTIVITIES TO A MATERIAL CONTROL AND INVENTORY CENTER: 31 JAN 84
3. TRAINING - COMPLETED BY 4 NOV 83; ON-GOING AS REQUIRED

PROBLEMS

1. MECHANICS PERFORMING PRODUCTION CONTROL FUNCTIONS DUE TO PRODUCTION CONTROLLERS IN TRAINING
2. PRACTICAL APPLICATION OF TRAINING - CLASSROOM VS REAL LIFE

FEEDBACK

1. INCREASED OUTPUT IN STRUCTURES AREA
2. REDUCTION OF PARTS CHASING BY PRODUCTION PERSONNEL - 4100 m/HRS IN JAN vs 1300 M, HRS IN MAY
3. TURN-INS TO SUPPLY \$796,347.00.
4. GS-09 PRODUCTION CONTROLLERS - RELIEF FROM MENIAL TASKS
5. GS-08 PRODUCTION CONTROLLERS - SHOP LOADING AND MONITORING WORK IN-PROCESS
6. TRAINING - "BEST IN-HOUSE TRAINING EVER"

STEP IPR 16 JUNE 1983

ASTORS CHANGES

PROGRESS

MOVE ASTORS TO PP&C DIVISION

KITTING COMPLETENESS

TIMELY DELIVERY

TRAINING

MILESTONES

KITTING AIRCRAFT PALLETS AT 97% to 100%

IN PROCESS TRAINING

PROBLEMS

RECEIPT OF PARTS FROM SHOPS

ROBBING PARTS WITHOUT CCAD FORM 557

FEEDBACK

IMPROVED COMMUNICATION

ASSEMBLY LINE DELIVERY

STEP IPR 16 JUNE 1983

ASTORS ROTATIONAL TRAINING FOR MECHANICS

PROGRESS

NO ACTION TO DATE

MILESTONES

NONE

PROBLEMS

NONE

FEEDBACK

RECOMMEND RE-EVALUATION

STEP IPR 16 JUNE 1983

AIRFRAME SHOP REALIGNMENT

PROGRESS

TRANSITION COMPLETED ON:  
ACFT DISAY UNIT TO PROCESS SECTION  
AFRM PAINT UNIT TO FLT & GND CK SECTION  
BOOM QCA-WG BLDU UNIT TO ACFT ASSY-SP PROJ SECTION

MILESTONE

IMPLEMENTATION COMPLETED

PROBLEMS

NONE

FEEDBACK

POSITIVE  
STEP TO EVEN FLOW  
CONTROL BY ELEMENT OF IMPACT

STEP IPR 16 JUNE 1983

MAINTENANCE VERIFIER

PROGRESS

18 OF 19 POSITIONS FILLED  
TRAINING IN PROCESS  
3 BLOCKS COMPLETED  
FAVORABLE QUALITY AUDIT

MILESTONES

CRITICAL TRAINING TO BE COMPLETED BY 8 JULY 1983  
ONGOING AS NEED ARISES

PROBLEM

SELECTION OF VERIFIER FOR LINE 4  
PROFICIENCY REQUIRED IN ALL SERIES OF ARMY AND CROSS SERVICE ACFT  
REFERRAL HAS BEEN EXHAUSTED OF THIS TYPE OF CANDIDATE

ADDITIONAL NAMES CANNOT BE REFERRED

TO ISSUE NEW REFERRAL:

NEW JOB DESCRIPTION

NEW JOB AUDITS

NEW JOB ANALYSIS

NEW PROMOTION BULLETIN

FEEDBACK

VERIFIER-CHALLENGING JOB, BIG PICTURE OVERVIEW  
MECHANICS-TECHNICAL SUPPORT, ASSET TO MECHANICS

FEEDBACK (CONTINUED)

SUPERVISOR-EXTENSION OF TECHNICAL ASSISTANCE, BETTER UNDERSTANDING OF THE QUALITY CONTROL FUNCTION, "OVERALL ASSET TO ME".  
INSPECTOR-"WE CAN HELP EACH OTHER PRODUCE BETTER RESULTS."

ON THE NEGATIVE SIDE

"OUR SHOP INFORMAL LEADER IS THE BEST, BUT NEVER STOOD A CHANCE."  
"WE CANNOT FOLLOW SOMEONE WE HAVE TO TRAIN."  
"OUR DESTINY IS GOVERNED BY REGULATIONS WE DARE NOT CHALLENGE."

STEP IPR 16 JUNE 1983

ASSEMBLY LINE MOVEMENT AND CLEAN UP

PROGRESS

FIVE MOVERS/CLEANERS ON THE JOB  
TRAINED IN SAFET AND ACFT HANDLING  
FOUR HAVE BEEN PROMOTED  
FOUR REPLACEMENTS SELECTED

MILESTONES

TRAINING: 20-22 JUNE 1983  
DEPLOY: 23 JUNE 1983

PROBLEMS

NONE AT THIS TIME

FEEDBACK

MECHANICS-RELIEF FROM MENIAL TASKS  
MOVERS-GOOD OPPORTUNITY FOR ACFT EXPOSURE  
GENERAL-"WE OUGHT TO HAVE THEM THROUGHOUT THE DIRECTORATE TO DO HOUSEKEEPING DUTIES."



**STEP IPR  
16 JUNE 83  
HARDWARE CAROUSEL**

**o PROGRESS**

o EA FOR CAROUSEL IN LARGE HGR COMPLETED AND DISAPPROVED

o EA FOR BLDG 258 AND FORWARDED TO DESCOM

**o PROBLEMS**

o DESCOM DISAPPROVED EA FOR BLDG 258 AND RECOMMENDS MISSION OF BLDG 258 BE INCORPORATED IN ASRS PLUS

# **STEP IPR 16 JUNE 83 STREAMLINING OF AIRCRAFT FLOW**

## **o PROGRESS**

**o STEP PROPOSAL EVALUATED**

## **o PROBLEMS**

**o TRANSPORTATION**

**o SPACE**

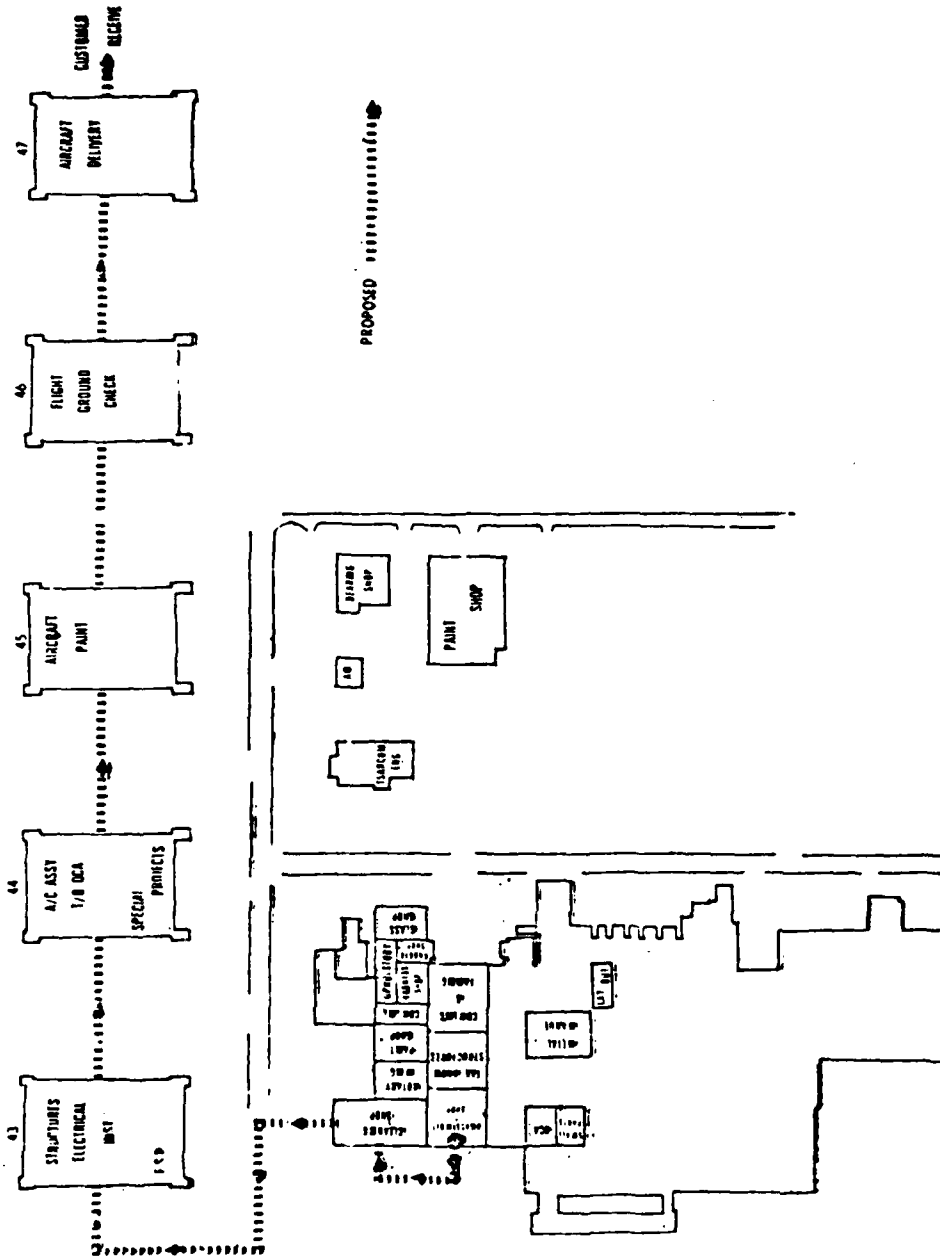
**o FLEXIBILITY**

**o COST**

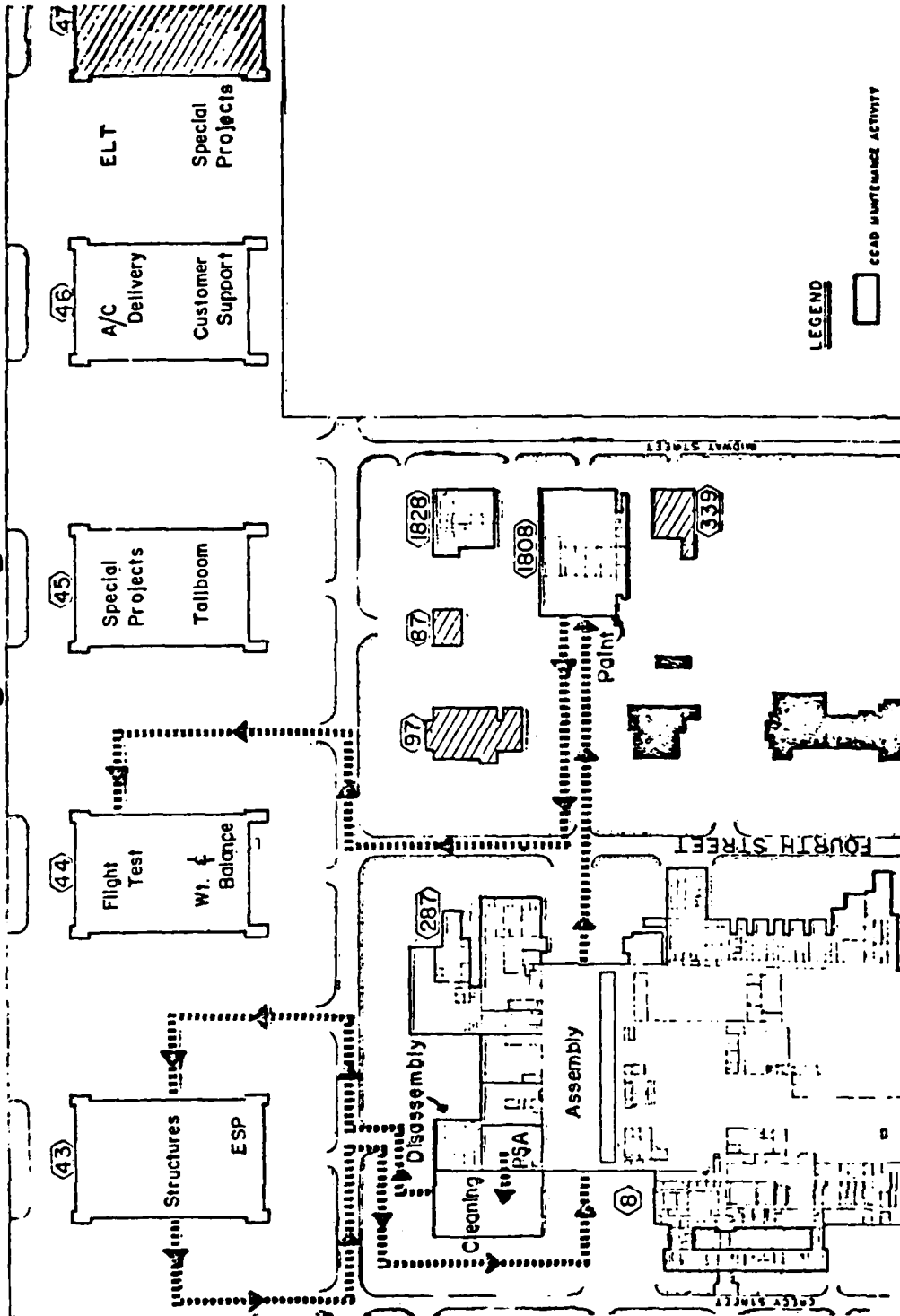
## **o FEEDBACK**

**o PED PROPOSAL**

# LONG-RANGE PROPOSAL FOR STREAMLINING OF AIRCRAFT FLOW



# PED Long Range Plans



DEAD-END JOB PROGRAM

(D/MAINTENANCE)

PROGRESS - A/F SHOP DIV CLEANING SHOP, DISASSEMBLY SHOP

FIFTY-SIX EMPLOYEES WERE COUNSELED, AND COMPLETED INDIVIDUAL DEVELOPMENT PLANS (IDP'S). THOSE INTERESTED WERE ENROLLED IN CORRESPONDENCE COURSES TO MATCH THEIR DESIRED WORK ASSIGNMENT. THREE EMPLOYEES WERE DETAILED TO DESIRED WORK ASSIGNMENT FOR 60 DAYS. THIRTEEN HAVE BEEN REASSIGNED FROM SHOP 5DB1B SINCE PROGRAM BEGAN.

ENGINE SHOPS DIV CLEANING SHOP, DEPRESERVATION AND CONTAINER REPAIR SHOP

FORTY-TWO EMPLOYEES WERE COUNSELED, COMPLETED IDP'S AND THOSE INTERESTED WERE ENROLLED IN CORRESPONDENCE COURSES TO MATCH THEIR DESIRED WORK ASSIGNMENT. ONE EMPLOYEE FROM EACH SHOP WILL BE DETAILED TO DESIRED WORK ASSIGNMENT. NINE EMPLOYEES HAVE BEEN REASSIGNED SINCE DEAD-END JOB REDUCTION EMPHASIS STARTED IN CCAD.

DEAD-END JOB PROGRAM

MILESTONES FOR ACTIONS NOT COMPLETED

(MAINTENANCE)

COMP SHOPS DIV - BEARING UNIT AUGUST 1983

PP&C DIV - TOOL, PARTS ATTENDANT SEPTEMBER 1983

(QUALITY ASSURANCE)  
SUP QC DIV - WAREHOUSE WORK INSP OCTOBER 1983

(SUPPLY)  
GEN SUP DIV - WAREHOUSE WORKERS NOVEMBER 1983

(MISCELLANEOUS)

CLERK-TYPIST, GS-322-03 SECRETARY, GS-318-03, 03 JUNE 1984  
MAIL AND FILE CLERK, GS-305-04 RUBBER EQUIP RPR, WG-4361-08  
DATA TRANSCRIBER, GS-356-02, 03 TRACTOR OPERATOR, WG-5705-05  
FORKLIFT OPERATOR, WG-5704-05

IMPLEMENTATION PROBLEMS

DELAY IN DETAILING SECOND GROUP IN A/F DIV BECAUSE OF LARGE NUMBER REASSIGNED.

T & D NOT STAFFED TO ADMINISTER ADDITIONAL PROGRAMS

FEEDBACK

REASSIGNED EMPLOYEES ARE VERY HAPPY. LOSING SUPERVISORS ARE BITING THE BULLET WITHOUT COMPLAINT.

S I E P I P R - 16 Jun 83

Supervisory Understudy Positions

PROGRESS: Current merit promotion regulations allow for use  
Retirement survey of present supervisory incumbents completed

MILESTONES: Identify position for understudy - ongoing  
Establish and fill position - 45/60 days after position is identified

PROBLEMS: None at this time

FEEDBACK: Positive - should provide for a fully trained supervisor  
should eliminate charges of grooming, favoritism and pre-selection

S I E P I P R - 16 JUN 83

Performance Testing

PROGRESS: Training on use of performance testing completed at RRAD - Jan 83  
Feasibility of contracting out the work being considered

MILESTONES: Scope of work package completed and forwarded to Procurement Division  
- 1 Jul 83

Contract Awarded 15 Aug - 1 Sep 83

PROBLEMS: None at this time

FEEDBACK: Some opposition expressed by Union

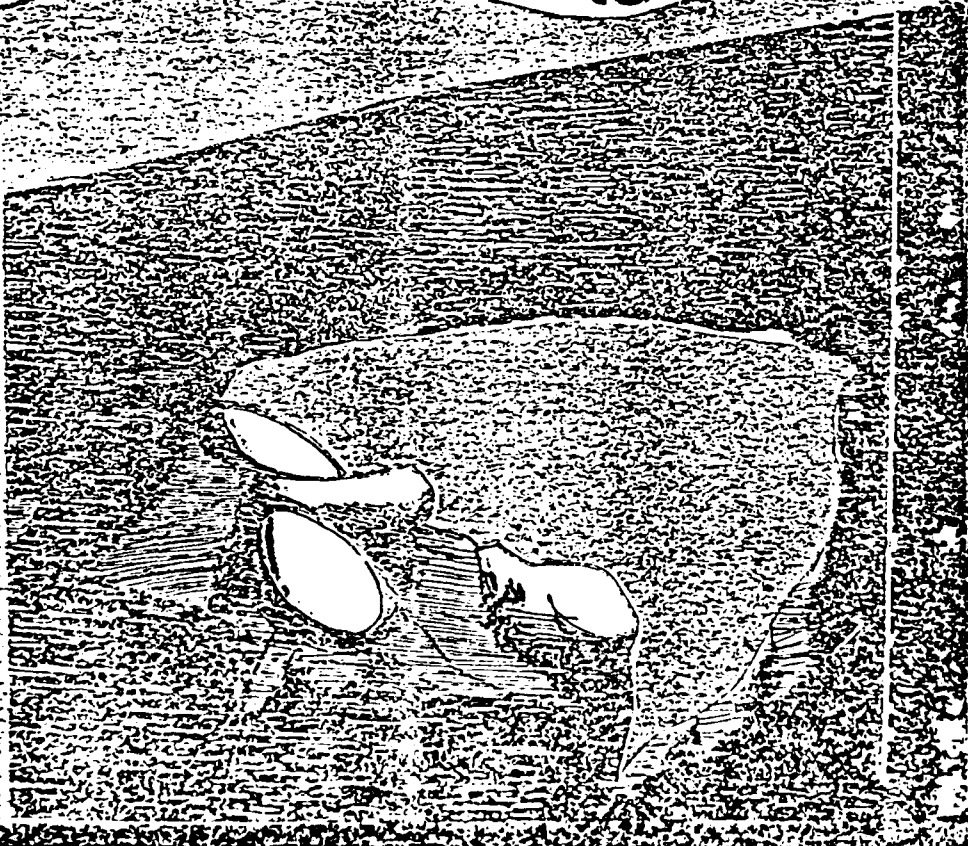


Directives to Underscore Depot Philosophy

<u>Directive</u>	<u>Issue Date</u>
Explanatory	20 Jun 83
Visibility of Management	27 Jun 83
Monetary Incentives and Other Forms of Employee Recognition	5 Jul 83
Communication - Keeping the Employee Informed	11 Jul 83
Respect for Individuals - Recognizing their Importance	18 Jul 83
Management Integrity and Responsibility	25 Jul 83
Training	1 Aug 83
Discipline	8 Aug 83
Harrassment and Intimidation	15 Aug 83
Favoritism	22 Aug 83
Discrimination	29 Aug 83

CORPUS CHRISTI ARMY DEPOT  
CORPUS CHRISTI, TEXAS

**PROGRAMS**  
**for SUPERVISORY**  
**and MANAGEMENT**  
**DEVELOPMENT**  
**7984**



STEP IPR  
16 June 1983

ROLE IDENTIFICATION TRAINING

A. PROGRESS

1. Airframes Division	Completed
2. Components Division	Completed
3. Engines Division	Completed

B. MILESTONES

None

C. PROBLEMS

1. Scheduling of Training Sessions
2. Presentations
3. Work Leader Positions

D. FEEDBACK

1. Maintenance Verifier Positions
2. Production Control

QUALITY PRODUCTIVITY RATIOS

"QPR"

BACKGROUND

PROGRESS

QPR ANALYSIS

REPLACE UH-1H CARGO DOOR TRACK  
(PART NUMBERS 205-030-220-7 AND 205-030-220-8)

INPUT DATA (FEB - MAY 83):	
NUMBER OF TRACKS REPLACED:	61
NUMBER OF DEFECTIVE TRACKS:	9
WORK CENTER LABOR COST PER HOUR:	\$35.91
STANDARD TIME TO REPLACE ONE TRACK (HOURS):	12
AVERAGE TIME TO TRIM ONE DEFECTIVE TRACK (HOURS):	5.56
STANDARD LABOR COST TO REPLACE ON TRACK:	\$431.00
AVERAGE LABOR COST TO TRIM ONE DEFECTIVE TRACK:	\$200.00

QPR FORMULA

CARGO DOOR TRACK

QPR = TOTAL NUMBER OF ITEMS X PROCESSING COST PER ITEM X NUMBER OF DEFECTIVE ITEMS X DEFECT PROCESSING COST PER ITEM

NUMBER OF ITEMS REPLACED

$$= \frac{61 \times 431.00 + 9 \times 200.00}{61}$$

$$= \frac{28,091.00}{61}$$

$$= \$461.00 \text{ AVERAGE COST TO REPLACE TRACK (INCLUDES DEFECT PROCESSING COST)}$$

QPR ANALYSIS  
CARGO DOOR TRACK  
AVERAGE DEFECT PROCESSING COST

AVERAGE COST TO REPLACE TRACK;  
(INCLUDES DEFECT PROCESSING COST) \$461.00

LESS: STANDARD COST \$431.00

AVERAGE COST INCREASE PER TRACK REPLACED: \$ 30.00



PROBLEMS

FEEDBACK

APPENDIX E

Key Work Centers

	<u>Work Center</u>	<u>Code</u>	<u>Number of People</u>
1.	Tailbooms	5DC1D	57
2.	Structures Repair	5DC2A(1,2,3,4)	117
3.	Glass/Plastic	5DC3A/B	51
4.	Assembly	5DB3(A/B/C/D)	174
5.	Airframe Paint	5DB2L	37
6.	Flight/Ground Check	5DB2 (A/B/C)	54
7.	Staging/Kitting	52J10	20
8.	Disassembly	5DB11	18

APPENDIX F

STEP-Related Training  
(Through June 1983)

Course	Number of Hours	Number of People	Type of People <sup>a</sup>	Total Hours
1. Parts Requisitioning Practices & Procedures	120	158	ME	18960
2. Instructor Training	40	37	WL	1480
3. Introduction to Quality	21	18	WL	378
4. Technical Writing	40	101	ME, WL	4040
5. Shop Workloading	40	94	PC	3760
6. Interpersonal Communication	16	19	WL	304
7. Role Definition	2	900	ALL	1800
8. Leader Management and Development Course	40	55	SUP	2200
			TOTAL HOURS	32,922
			-----	
			STAFF YEARS	15.76

<sup>a</sup> ME refers to Material Expeditors; WL refers to Work Leaders; PC refers to Production Controllers; and SUP refers to Supervisors.

FORMATIVE EVALUATION VI (JULY - DEC 83) OF THE SOCIOTECHNICAL EVALUATION  
PROGRAM (STEP) AT THE CORPUS CHRISTI ARMY DEPOT

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December 1983

SCOPE OF THE EVALUATION

This evaluation covers the activities following the 16 June 83 In-Process Review (IPR) through December 1983. It is based on two "snapshots" of the progress made in the implementation. The first was during a one-week site visit and IPR in October; the second was a two-day visit in early December with one of the STEP consultants who had not been at the Corpus Christi Army Depot (CCAD) since formal implementation of STEP was begun nearly a year earlier.

During this time the results of the June administration of the Employee Survey became available and permitted comparisons with the DEC 82 administration. These results, as well as an update on the hard data measures, will be briefly discussed. All these findings and observations and assessments were presented formally in a major IPR for the Commander, DESCOM, on 28 October 1983.

OCTOBER 1983 IN-PROCESS REVIEW

Description

On 28 October 1983, a formal IPR was conducted for the Commander, DESCOM and two other representatives from DESCOM. The DESCOM representative and the author, representing ARI, were the only "outsiders" at the IPR. From CCAD, the STEP Design Group members and individuals with direct responsibilities for implementing and tracking the various recommendations were present. Also present was the usual assembly of top managers with the notable exceptions of the Director of Maintenance, and the Chief of the Production, Planning, and Control Division.

Appendix A contains the briefing slides which were presented by the different Depot principals involved in STEP. Appendix B contains ARI's presentation. Each will be briefly discussed.

### Depot presentation

The Depot presentations addressed each of the STEP recommendations and gave a brief status report on each.

- WG-2 laborers are considered useful and productive, but positions have high turnover.
- Maintenance Verifiers have been selected and trained and are working in areas of most impact. Improvements are noted in various areas including defects, rework hours, communication, and smoothing of aircraft flow.
- Production Controller (PC) transfer to the Production, Planning and Control Division (PPC) is complete. PCs have been trained and are planning, sequencing, requisitioning and scheduling the parts, hardware, and materials required by the shops. Overall effect is positive.

During this time a discussion ensued in which the Commander, DESCOM, sought and got reassurances that the PCs were not being tasked with anything new. However, the PC function is now more fully manned to remedy a DSOS reorganization of several years earlier. Many quality and experienced PCs were lost in that reorganization. Due to the pay differences between WGs and GSs these highly qualified people are not coming back to the PC job and the current workforce has many new and less experienced PCs. A recommendation to upgrade all PC's was advanced and was not rejected by DESCOM.

- Movement of Automated Storage and Retrieval System (ASTORS) to PPC has led to increased communications between ASTORS and shops and a re-evaluation of what needs to be stored in ASTORS and what can be controlled in the shops or on the assembly line. Transfer of the parts forecasting function from the Maintenance to the Supply Directorate and its relocation in close proximity to the shops has been successful. The function has become more proactive and the material requirements lists (MRL) reviews are now considered vital, are more comprehensive, are ahead of schedule and are accomplished with input and cooperation among all the key parties involved.
- Transfer of the Pre-Shop Analysis function to the Directorate for Quality Assurance has had the expected positive effect of greater communication between the examiners and the inspectors. A program was initiated to plot defects on a diagram of the Airframe to show inspectors/examiners those areas where defects are most frequently found.
- The development of performance tests for use in the promotional process will be contracted out and is proceeding as planned.
- Supervisor understudy positions are being identified, announced, and applicants are competitively selected for these positions as soon as they become known. No problems are envisioned.

- Dead-end jobs have been identified and employees choosing to participate are being referred to correspondence courses or supervisors with job vacancies in the program.
- A supervisor/management training program has been developed for CCAD to bring training on-site, to minimize TDY (travel) costs, and to ensure a quality sequential/progressive program tailored to the specific needs of the Depot.

#### ARI presentation

Appendix B contains the slides for ARI's presentation which accounted for nearly 50% of the IPR's duration. The ARI researcher was introduced by the CCAD Commander with the acknowledgement that he had not seen the briefing but hoped it was favorable.

ARI's briefing reviewed ARI's role in the project, the approach used, and the accomplishments to date. The measures used to evaluate STEP were introduced and problems with each were briefly discussed.

Results of the archival ("hard") data were mixed and difficult to interpret due to the variability of the data, contaminations by other factors, and the complexity of the measures. Similarly, there were no major overall differences in employee and supervisor perceptions between the December 82 and June 83 administrations of the employee survey. The CCAD Commander pointed out that this may be due, in part, to the fact that in December 82, the STEP project had already been around a while to exert its influence and that the STEP training consumed most of the interval between the two administrations.

Nevertheless, there were some meaningful indicators of positive change in response to individual survey questions. These changes tended toward greater perceived fairness in personnel matters, greater autonomy and participation in work-related decisions, and generally positive attitudes about STEP. Most significantly, those employees directly involved in STEP perceived a much greater increase in productivity than those employees not directly involved in the reorganization.

A content analysis of the handwritten volunteered comments on the June 83 survey still reflected some concern in the areas of alienation, personnel actions, and supervisory practices. These findings are generally confirmed by subjective observations and interviews. See Appendix C for the comments.

Most discussion was generated by the "interpretations" and "lessons learned" portion of the presentation. There was general concurrence with the interpretation that it was "too early to tell" and that the lack of an initial drop in performance following the intervention may actually be a positive indicator. The Commander, DESCOM, commented that it took the Japanese 30 years to reach this high level of productivity.

The Commander, DESCOM, also questioned the meaning of "limited capacity for improvement" as a possible explanation of the lack of results. This was taken to mean CCAD was unable or unwilling to change. Rather this had been intended to refer to CCAD's already high performance level and not to any limitation in their capacity, ability or motivation to improve.

There was also some discussion of "passive non-cooperation by some." The Commander, DESCOM, indicated that usually this is "large" and wanted to know the basis and meaning of "some". It was explained that this observation was highly subjective and represented periodically encountered discrepancies between what people said they would do and what others report they did--or, more usually did not do. "Some" refers to more than a "few," but less than "most" or "many".

In the lessons learned, the Commander, DESCOM, suggested that "maintaining reasonable and low expectations" be reworded to "maintaining reasonable and realistic expectations." He recognized the problem with having too high an expectation but believed that one should not have low expectations. There was no disagreement with this observation.

#### Evaluation

No doubt, as a result of the presence of the Commander, DESCOM, the IPR was considerably more formal than previous IPRs. This was entirely appropriate, since the IPR was for his benefit and was not a "working" IPR for CCAD's benefit. Considerable learning had taken place and both the slides and presentations by the STEP Design Group members and other key Depot personnel were well-organized and professionally delivered. This can be attributed, in part to the "dry runs" preceeding the actual IPR.

Most of the presentations can be summarized by, "we did what we were supposed to do and everything is going fine." This was generally accurate. Implementation of the STEP recommendations was basically on schedule and slippages were reasonable and due largely to the magnitude and complexity of the tasks involved.

The success of the implementation was largely based on testimonials. However, at this point in time during the project, this was not unreasonable in light of ARI's own briefing of the difficulties encountered in uncovering "hard" evidences of measured improvements. These difficulties tinged the IPR with some frustration and disappointment--not so much with STEP as with the inability to present the hard data to substantiate the subjectively "sensed" improvements in the Depot.

The evaluation of the Commander, DESCOM, took a similar track in his concluding comments. He liked what he heard and saw. He believed that CCAD was better than it was before, but indicated that "the jury was still out" on overall effectiveness. Yet, he would be the first to admit that initiatives such as STEP are long-term interventions.

## DATA COLLECTION AND INTERVIEWS

### Description

During the week of the IPR, extensive interviews were conducted with key managers at the Depot to assess Depot status. Based on these interviews and coupled with direct observation, the following conclusions could be drawn.

There was implementation of a number of innovations. "Call lights" were installed on the assembly line to permit mechanics to quickly signal the need for assistance. A special caged staging area for small parts was constructed to reduce parts robbing, and aircraft now had the "due out" date stamped on their nose to permit quick and ready visibility of its progress on the assembly line.

The Depot, as a result of working extensive overtime, had "caught up" and could now begin to smooth the flow. This was the "best shape they'd been in since the Vietnam War."

The Depot had had difficulties meeting DESCOM'S direct/indirect manhour ratio in June 83. In October of 1983 that deficiency had apparently been remedied but at the expense of increased manhours per UH-1H. Efforts to identify the reasons for the increased manhours were extensive. Some of the increase was attributed to an increase in work required, but the bulk was unexplainable. Inaccurate reporting of hours particularly in some work centers, was hypothesized to be a main factor. The large number of new hires and increased amounts of training were among other factors.

The Automated Labor Production System (ALPS) and Maintenance Shop Floor Systems were scheduled to go operational in a week. There had been extensive training of supervisors. Supervisor abilities to learn the new computerized systems varied considerably, with some learning in hours and others in weeks. Expectations about these computer systems were mixed, and there was considerable disagreement about the usefulness of the systems. Computer downtime was a major problem and criticism.

It continued to be difficult to assess if there was a reduction in parts shortages. Computerized printouts of "% fill" are considered virtually meaningless. Many (35%) of the aircraft parts no longer go to ASTORS but go directly to up-front staging areas. Although this works fine, it does not give the Depot the slack it needs in the event there is a sudden requirement to increase production. That is, there would not be a sufficient inventory to support a sudden increase in production.

Personnel activity had been intense. The Depot was in a hiring mode; there were a number of reclassifications, including some (about 20) downgradings (e.g., in the Quick Change Unit). Real progress was being made on the "supervisor understudy" program, the performance testing contract, and



the dead-end job program. In the latter program, there was the danger of going too fast, because it continued to be important to also have good and experienced workers even in dead-end jobs.

Many of the pay/classification complaints heard from employees reflect the complexities of a system which has workers in many different pay schedules working side-by-side. This is complicated by different oversight responsibilities, e.g., the DCSPER only tracks and monitors "grade creep" in the GS grade levels.

The collection of hard data measures encountered two serious setbacks. First the MIS-Q computerized reporting system, which included reports of the number and types of defects found, "went down" in late summer of 1983. This was the result of a hardware switch and software incompatibilities. This downtime was expected to last a number of months and essentially left the Depot without defects data.

Also during the summer, the PE (Performance Efficiency) ratios were eliminated. This measure provided weekly, monthly, and yearly cumulative data to each direct labor shop to show to what extent actual hours reported corresponded to measured standards. DESCOM criticisms of the audit trails and inadequate documentation of the standards led to the decision to eliminate the PE until these standards could be approximately restructured and documented.

### Evaluation

Production-wise the Depot appeared in much better shape than it had been. There were considerable evidences that innovations were taking place, and there was a lot of talk about being proactive rather than reactive. At the same time, there were considerable frustrations in not being able to do the best job possible due to the complexities of the system and the bureaucratic constraints.

Micromanagement was cited a number of times as a major obstacle to getting the job done. This appeared to be a legitimate complaint, considering the reported orientation of some managers to involve themselves heavily in the "fixing of problems" as soon as these reached their level of awareness. This tended to generate a certain amount of ill-will in the subordinates and frequently generated more work than would have been required otherwise.

The overall mood at the Depot continued to be optimistic and hopeful that all the energies and efforts being expended to increase productivity would, with time, demonstrate a positive effect. Despite frustrations at not being able to demonstrate more tangible progress, the greater participation of everyone in the decision-making process had had a significant positive effect on the cohesion and morale of the Depot.

## THE 7-8 DECEMBER 83 SITE VISIT

This two-day site visit was designed to coincide with the first return visit of one of the sociotechnical design consultants. Because it is based on only two days, it is necessarily limited in scope, but will help serve to update some of the events that transpired since the October IPR for the Commander, DESCOM.

### Description and Evaluation

One of the more meaningful activities during the two-day visit was attendance at one of the weekly meetings of Maintenance Verifiers (MVs). Attendance at this meeting resulted in a number of observations.

- MVs are having regular meetings to discuss common problems and to develop solutions to those problems.
- The meeting was a vehicle for a representative from the material expeditors (production control) function to inform the MVs that 1/3 of the crew chiefs' requisitions for small common parts are incorrect or unjustified. A branch chief's availability at this meeting allowed everyone to learn that defect reports from MIS-Q are again being distributed. MVs will be able to use these to help identify common defects and mechanics who may require more guidance.
- Participation of a Quality Inspector at the meeting showed useful and constructive coordination. The MVs appeared to be mechanic- and training-oriented and helped to act as a buffer between the mechanics and the Quality Control Inspector or supervisor. Reportedly, mechanics are more likely to claim ignorance and request help from their MV than their supervisor.
- There was considerable cohesion among the MVs, much of it attributed to the bonds formed during their formal training. Although part shortages (especially in engines and hydraulics) remained a serious problem, A/C are produced in less flow days than before. Having MV counterparts in the prime shops may be expected to facilitate the getting of parts from those centers. Special project details are perceived to drain important expertise from the work centers and tend to create an elitist corps who alone are eligible for the desirable TDY assignments.

The Forecaster move to the Supply Directorate appears to have resulted in a more proactive ordering of parts and an increase in MRLs (Material Review Lists). Now firmly staffed with a mixture of new supervisors, derived from both former maintenance and supply employees to ensure representative balance, interactions with TSARCOM (Troop Support and Aviation Material Readiness Command) are improving and resulting in less defensiveness and more mutual trust. Relationships with Production Control are

good, due to shared STEP training experiences. Although transferred to a Directorate of perceived lower status, the forecasters now have more freedom to do their job and their job has been more explicitly recognized to be "important."

Based on a recommendation made at the time of the last IPR, a log book had been started to document various changes being implemented at the Depot. Some significant changes recorded pertain to the Branch-level tracking of sick leave, spot checks of pallet fill-rates, updating of kitting printouts, overtime directives, and use of Forms 831 to requisition common hardware. Also included are several MFRs, proposals for changes, and documentations of new problem solving IPRs. The log is of a high quality and will serve as useful documentation of Depot change management.

The new shop floor system shows some promise, although it is going through a lengthy shakedown procedure and is still down an excessive amount of time.

The newly hired employees and supervisors are changing the character of the Depot. Without the added burden of overcoming old habits (which may not be as useful today as they were yesterday), new employees are often the most ready to grasp the new ideas and procedures being institutionalized.

Although the number of flowdays has decreased, the manhours per UH-1H have increased. "Hard" assessment of the effects of STEP are premature, although softer measures, such as a decrease in the number of interruptions (crises) are reported by some supervisors and managers.

The consultant's assessment of the progress (made since the beginning of the implementation phase a year earlier) was that much had been done and he believed the Depot to be about where he had thought it would be. He noted that there were still some problems with coordinating the roles of Production Controllers, Maintenance Verifiers, Supervisors, etc. and that additional role clarifications and team building would be desirable. It was also clear that the extent to which the STEP-designed changes worked well was often determined largely by the personality characteristics and styles of the individuals involved.

#### SUMMARY

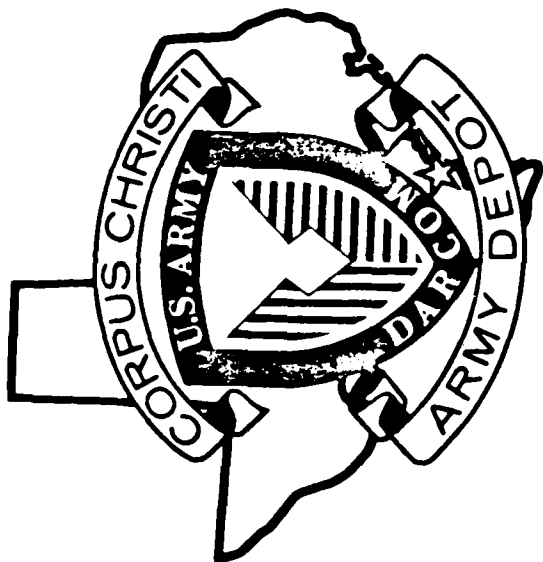
Considerable progress had been made at the Depot since June 1983. STEP training was largely completed and newly-trained personnel have had a chance to function in their new roles. This surfaced some natural rough spots and frictions as the different personalities "jockeyed" for position.

The mood at the Depot is still optimistic, but there is distinct disappointment in not seeing more dramatic results. Particularly frustrating was the increase in manhour costs for the UH-1H and the difficulties encountered in trying to identify the source of the increase.

STEP spinoffs continue to emerge. Although often intangible, the extensive training is generally deemed long overdue and highly worthwhile. This training and the STEP philosophy have provided CCAD managers with a more systemic view of their organization and have "broken the old molds." STEP initiatives and the new participative approach to decision-making and problem solving have helped "grease the skids" for a number of other innovations. Generally, the Depot is planning more, is more proactive, and is more creative in its adaptations to change.

Finally, there is an increasing recognition of the importance of a valid and reliable measuring system. This is important not just to meet mandated reporting requirements, but to permit the Depot to evaluate itself meaningfully over time and to track its performance. Such performance measures are also an important requisite for any award system and the Commander, CCAD, has tasked the Resources Management and Evaluation Division to develop a system that will permit more meaningful performance comparisons across units. With such a system, and to the extent it is meaningful and fair, recognition and rewards can then be given to superior units for maximum impact and benefit.

**CORPUS CHRISTI ARMY DEPOT**



**Briefing**

PRESENTED TO

**MG HENRY H. HARPER**

**28 OCTOBER 1983**

# SOCIO-TECHNICAL EVALUATION PROGRAM

(STEP)

## IN-PROCESS-REVIEW TOPICS

AIRCRAFT ASSEMBLY LINE MOVERS

MAINTENANCE VERIFIERS

PRODUCTION CONTROL FUNCTION

AUTOMATED STORAGE AND RETRIEVAL FUNCTION

REPAIR PARTS FORECASTING FUNCTION

PRE-SHOP ANALYSIS FUNCTION

PERFORMANCE TESTING

SUPERVISORY UNDERSTUDY POSITIONS

DEAD-END JOB PROGRAM

SUPERVISORY/MANAGEMENT TRAINING PROGRAM

GOOD MORNING, SIR.

AS YOU RECALL, THE ORIGINAL APPROVAL, FROM DESCUM, TO IMPLEMENT THE STEP INITIATED RECOMMENDATIONS, ASKED FOR A MID-YEAR IPR TO BE GIVEN AT HEADQUARTERS. THIS WAS ORIGINALLY SCHEDULED FOR 1 SEPTEMBER, AND SUBSEQUENTLY DELAYED DUE TO SCHEDULING CONFLICTS WITH THE COMMANDER'S CONFERENCE.

THESE ARE THE TOPICS TO BE BRIEFED THIS MORNING, AND WE HOPE THAT THE INFORMATION WE HAVE FOR YOU WILL BE USEFUL TO YOU AND YOUR STAFF BETWEEN NOW AND THE TIME OF THE DECISION BRIEFING, SCHEDULED FOR EARLY IN 1984.

AIRCRAFT ASSEMBLY LINE MOVER

ANYTIME AIRCRAFT WERE PRODUCED OUT OF THE ASSEMBLY LINE, THE ENTIRE LINE WAS STOPPED TO MOVE THE COMPLETED AIRCRAFT OUT AND THEN TO MOVE THE REST OF THE AIRCRAFT TO THEIR NEW STATIONS. THE MOVEMENT AND CLEANUP PROCESS WAS ENGAGING THE SKILLS AND LABOR OF HIGHER GRADED MECHANICS, THEREFORE PRODUCTIVE TIME WAS LOST ON THESE MENIAL TASKS.

FIVE AIRCRAFT MOVERS/CLEANERS WERE HIRED TO ASSUME THESE DUTIES AT THE LABORER WG-02 LEVEL. THESE EMPLOYEES MOVE THE AIRCRAFT AND CLEANUP THE RESPECTIVE AREAS ONE HOUR PRIOR TO THE NORMAL TOUR OF DUTIES ALLOWING LITTLE OR NO TIME FOR DISRUPTIONS. AFTER THEY COMPLETE THEIR ASSIGNED DUTIES, THE MOVERS SUPPORT THE PRODUCTION ELEMENT TO DELIVER SMALL PARTS TO THE AIRCRAFT AND HELP TO STOCK HARDWARE BINS, AVERAGING APPROXIMATELY 16 HOURS OF INDIRECT LABOR. THE MOVEMENT AND CLEANUP ARE CHARGED TO DIRECTS.

THE ONLY PROBLEM HAS POSITIVE CONNOTATIONS. WE HAVE A HIGH TURNOVER OF THESE INDIVIDUALS BECAUSE THEY ARE PROMOTED TO WG-05 HELPERS AS SOON AS POSITIONS ARE VACANT. THIS IS IN KEEPING WITH THE PHILOSOPHY STATEMENT AND OUR EFFORTS TO CONTROL DEAD-END JOBS.



# AIRCRAFT ASSEMBLY LINE MOVERS

## BACKGROUND INFORMATION

ENTIRE LINE WAS STOPPING TO MOVE AIRCRAFT  
TIME LOST TO MOVE AIRCRAFT AND CLEAN-UP AREA

## CURRENT STATUS

WG-02 MOVERS HIRED  
AIRCRAFT MOVEMENT AND CLEAN-UP OCCURS PRIOR TO REGULAR TOUR OF DUTY  
AVERAGE OF 16 HOURS INDIRECT LABOR  
SUPPORT TO PRODUCTION CONTROL

## PROBLEMS

180% TURNOVER IN INCUMBENTS

### MAINTENANCE VERIFIER POSITIONS

IT WAS THE PERCEPTION AT ONE TIME THAT QUALITY ASSURANCE INSPECTED QUALITY INTO THE PRODUCTS RATHER THAN TO BUILD QUALITY INTO THE PRODUCTS BY THE MECHANICS. THIS WAS THE RESULT OF THE SKIMPY TRAINING PHASE THAT WE AFFORDED NEW EMPLOYEES. THE PACE WAS SO ACCELERATED THAT MEANINGFUL ON THE JOB TRAINING AND FORMAL TECHNICAL EDUCATION WAS VIRTUALLY NON-EXISTENT. THE CONCEPT OF THE MAINTENANCE VERIFIER WAS BORN BECAUSE OF THIS PHILOSOPHY.

NINETEEN MAINTENANCE VERIFIERS HAVE BEEN STRATEGICALLY PLACED IN THE AREAS OF MOST IMPACT - STRUCTURES, ASSEMBLY AND FLIGHT TEST. THE INCUMBENTS HAVE BEEN TRAINED TO ASSUME THEIR ROLES. THEY HAVE BEEN EXPOSED TO INTERPERSONAL RELATIONSHIPS, TECHNICAL WRITING, EFFECTIVE COMMUNICATION, TECHNICAL MANUALS, ETC. THROUGH THEIR VERIFICATION PROCESS AND TRAINING EFFORTS, WE HAVE REALIZED A DECLINE IN DEFECTS BY APPROXIMATELY 40%. THIS IN TURN HAS RESULTED IN A REDUCTION OF REMORK MANHOURS BY 40%. COMMUNICATION HAS STRENGTHENED THE TIES OF THE VERIFIERS BETWEEN THE ASSEMBLY LINE AND AMONG THE OTHER AREAS THAT IMPACT THEM. TRAINING IS MORE SERIOUS IN THAT NOW IT IS ON A ONE TO ONE BASIS WITH EXPECTED RESULTS. THE PROOF OF THE TEST IS THE SHAPENING OF MECHANICS SKILLS AMONG THE NEW EMPLOYEES AND THE REINFORCEMENT OF SKILLS OF OUR VETERAN MECHANICS. BETTER UNDERSTANDING OF THE AIRCRAFT AND AIRCRAFT PROCESSES HAS IMPROVED TURNAROUND TIME AND HAS CONTRIBUTED DRAMATICALLY TO THE SMOOTHING OF THE AIRCRAFT FLOW.

## MAINTENANCE VERIFIER POSITIONS

### BACKGROUND INFORMATION

RESPONSIBILITY FOR QUALITY BELONGED TO QUALITY ASSURANCE ALONE  
A NEED TO IDENTIFY TRAINING REQUIREMENTS  
ABSENCE OF MEANINGFUL O-J-T

### CURRENT STATUS

POSITIONS FILLED  
INCUMBENTS TRAINED  
DECLINE IN DEFECTS  
BETTER COMMUNICATION  
TRAINING IMPROVED  
REDUCTION IN REWORK  
IMPROVED TURNAROUND  
SHOP SKILLS IMPROVED  
SMOOTHING OF AIRCRAFT FLOW

GOOD MORNING , SIR. MY NAME IS CHARLES PRESSLEY. I AM A PRODUCTION CONTROLLER IN THE MFG PLNG BR OF PROD PLNG & CONTROL DIV. I WAS, ALSO, A MEMBER OF THE STEP DESIGN GROUP.

I HAVE TWO TUPICS TO BRIEF YOU ON. THE FIRST BEING THE MOVE OF AIRFRAMES PRODUCTION CONTROL FUNCTION TO PPC DIV.

BACKGROUND INFORMATION - AS YOU REMEMBER, SIR, FROM A PREVIOUS PRESENTATION IN SEP 82, THE TECHNICAL ANALYSIS OF THE SOCIO-TECH PROGRAM IDENTIFIED PARTS AVAILABILITY AS A KEY VARIANCE INVOLVED IN AIRFRAMES OVERHAUL. THE SOCIAL ANALYSIS IDENTIFIED THE PRODUCTION CONTROL FUNCTION TO BE UNDERSTAFFED AND INEFFECTIVE. THESE WEAKNESSES CRIPPLED THE EFFORT TO PROVIDE PARTS TO MECHANICS IN A TIMELY MANNER. IT RESULTED IN AN UNEVEN WORK FLOW AND CAUSED FRUSTRATION OF MECHANICS AND SUPERVISORS WHO WERE NOT TRAINED FOR THIS TYPE OF WORK BETTER INTEGRATION OF THE PRODUCTION CONTROL FUNCTION AT THE SHOP LEVEL IN SCHEDULING THE WORKLOAD WOULD ALLEVIATE MANY OF THE PARTS PROBLEMS BEING EXPERIENCED.

CURRENT STATUS - CURRENTLY, A LARGE PORTION OF THIS PROBLEM HAS BEEN RESOLVED BY MOVING THE AIRFRAME PRODUCTION CONTROL FUNCTION TO PPC DIV. WE HAVE CREATED A PRODUCTION SPECIALIST IN EACH SHOP WHO IS RESPONSIBLE FOR PLANNING, SEQUENCING, REQUISITIONING, AND SCHEDULING PARTS, HARDWARE, AND MATERIALS REQUIRED BY THE SHOPS. THIS FUNCTION HAS REDUCED THE NEED FOR MECHANICS AND SUPERVISORS TO CHASE DOWN AND FOLLOW UP ON PARTS, MATERIALS, AND HARDWARE. SUPPORT SHOPS ARE BEING SCHEDULED ON A DAILY BASIS. PRIORITY

ARE BEING IDENTIFIED TO SHOP SUPERVISORS WHICH INSURES PROPER ITEMS ARE BEING WORKED. WE ARE MAINTAINING AN ADEQUATE STOCK OF COMMON HARDWARE ON THE ASSEMBLY LINE TO SUPPORT MECHANICS AND ELIMINATE PARTS CHASING.

THE INITIAL TRAINING FOR PERSONNEL IN ALL THREE COMMODITY AREAS HAS BEEN COMPLETED. THIS THREE WEEKS OF INTENSIVE TRAINING WAS CONDUCTED JOINTLY BY PERSONNEL FROM DIR, SUPPLY AND DIR, MAINT. THE INTERFACE OF THESE TWO DIRECTORATES STRENGTHENED THE COMMUNICATION LINK IN PROVIDING BETTER PARTS REQUISITIONING PRACTICES AND PROCEDURES. WE HAVE HEARD VERY POSITIVE COMMENTS ON TRAINING FROM ALL PPC ELEMENTS.

SUPERVISORS AND QUALITY PERSONNEL ARE NOW BEING BROUGHT INTO PLANNING AT AN EARLIER STAGE. THEY ATTEND PRODUCTION CONTROL MEETINGS, DISCUSS RECURRING DEFECTS, AND MAKE RECOMMENDATIONS TO IMPROVE PRODUCTION. WE HAVE MADE ADJUSTMENTS OF SUPERVISORY PERSONNEL FOR PPC DIVISION TO PROVIDE MAXIMUM UTILIZATION OF SKILLS AND ABILITIES. THESE SUPERVISORS HAVE BEEN PLACED IN CHARGE OF PERSONNEL BASED ON THEIR EXPERTISE AND PREVIOUS BACKGROUND. THIS KNOWLEDGE ASSURES GREATER DEPTH IN ASSISTING SUBORDINATES WITH PRODUCTION PROBLEMS AND ALSO PROVIDES INTEGRATION WITH SHOP SUPERVISORS.

VII-18

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AN EXTENSIVE EFFORT TO IDENTIFY EXCESS PARTS HAS TAKEN PLACE AND \$638,104.81 IN MATERIAL HAS BEEN TURNED INTO SUPPLY. THIS EFFORT IS ONGOING. OUR CURRENT SYSTEM OF CONTROLLING ALL ROUTABLE PARTS VIA THE CARDS AND SHORTAGE LISTINGS HAS RESULTED IN OVER CONTROL. THE SHOP TRAVELERS OF 448 OUT OF A POSSIBLE 985 ROUTED ITEMS ARE IN THE PROCESS OF BEING CHANGED TO BE MANAGED BY THE ASSEMBLY LINE IN LIEU OF BEING KITTED IN ASTORS. THESE PARTS ARE ITEMS SUCH AS TUBES, HOSES, DUCTS, AND SMALL PARTS THAT THE PRIME SHOP NEED NOT BE RESPONSIBLE FOR REQUISITIONING AND PLACING INTO ASTORS. THE ASSEMBLY LINE WILL CONTROL THIS PROCESS AND GREATLY REDUCE THE HANDLING TIME AND STORAGE PRIOR TO ASSEMBLY ON THE AIRCRAFT.

WE NOW HAVE A FIRM VISIBILITY FOR OUR AIRCRAFT SCHEDULE THAT WE HAVE NEVER HAD BEFORE. SOME EXAMPLES OF THIS VISIBILITY ARE: WE HAVE 42 AIRCRAFT SCHEDULED FOR OCTOBER. ALL OF THESE AIRCRAFT HAVE CLEARED THE ASSEMBLY LINE AND 26 SOLD TO SUPPLY AS OF 20 OCTOBER. FOR NOVEMBER, 11 OF THE 42 AIRCRAFT SCHEDULED ARE OFF THE ASSEMBLY LINE. 12 AIRCRAFT OF THE DECEMBER SCHEDULE ARE ON THE ASSEMBLY LINE AND WE ARE PLANNING INTO JANUARY. THERE IS NOW A UNIFIED EFFORT IN COMMUNICATIONS, AND EXCHANGE OF INFORMATION FROM SUPPORT SHOPS IN COMPONENTS AND ENGINE DIVISIONS, AND ALSO BETWEEN PRODUCTION CONTROLLERS, MAINTENANCE VERIFIERS, AND QUALITY. THESE INDIVIDUALS ARE NOW POOLING THEIR IDEAS AND WORKING AS A GROUP TO RESOLVE PRODUCTION AND KITTING PROBLEMS. THIS COHESIVENESS BETWEEN SHOPS AND PEOPLE HAS ALLOWED FOR SMOOTHER AIRCRAFT PRODUCTION.

SIR, BASICALLY OUR OBSERVATIONS ARE THAT THE PEOPLE AT CCAD HAVE A VERY POSITIVE

# AIRFRAME PRODUCTION CONTROL FUNCTION

MATERIAL  
BILLING

## BACKGROUND INFORMATION

BEING  
E  
ED  
WILL  
MBLY

PRODUCTION CONTROL FUNCTION UNDERSTAFFED AND INEFFECTIVE  
STRENGTHEN COORDINATION LINKS  
PRODUCTION SPECIALIST TO SCHEDULE WORKLOAD

## CURRENT STATUS

SCHEDULING SUPPORT SHOPS  
INITIAL TRAINING COMPLETE  
PLANNING STAGES INCLUDE SUPERVISORS/QUALITY  
IDENTIFY EXCESS PARTS  
POSITIVE COMMENTS ON COMMUNICATION AND EXCHANGE OF INFORMATION  
SMOOTH AIRCRAFT PRODUCTION

VII-20

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OBER.  
ET

## OBSERVATIONS

OLLERS,  
AND

TIME TO FULLY INCORPORATE PLANNED ACTION

ATTITUDE TOWARDS A COMMON GOAL OF WORKLOADING AND SCHEDULING THE SHOPS, BUT THERE ARE PRODUCTION CONTROL POSITIONS YET TO BE FILLED AND ADDITIONAL TRAINING TO FULLY UTILIZE THIS TALENT. TO ACHIEVE BETTER MANAGERIAL CONTROL IT IS THE OPINION OF MY SUPERVISORS THAT A MILESTONE OF 6 MONTHS TO 1 YEAR IS NEEDED TO INCORPORATE ALL PLANNED ACTIONS.

ARE THERE ANY QUESTIONS?



THE SECOND TOPIC IN MY BRIEFING IS THE MOVE OF THE ASTORS FUNCTION FROM AIRFRAMES SHOPS DIVISION TO PPC DIVISION. ASTORS IS THE ACRONYM FOR AUTOMATED STORAGE AND RETRIEVAL SYSTEM.

BACKGROUND INFORMATION - OUR SYSTEM WAS UNABLE TO PROVIDE PARTS IN A TIMELY MANNER. THE WORKFLOW WAS UNEVEN AND SUPERVISORS/MECHANICS WERE FRUSTRATED CHASING PARTS AND DEALING WITH INCOMPLETE KITS. THE PRODUCTION CONTROL FUNCTION WAS UNDERSTAFFED DUE TO THE DESOS REORGANIZATION. SUPERVISORS WERE OVERLOADED WITH THE RESPONSIBILITY OF ALLEVIATING PARTS SHORTAGES IN ANY MANNER THEY COULD. (ROB-BACK, NIGHT RIDERS - NORMAL AFTER DUTY HOURS PERSONNEL FROM FLIGHT TEST WHO REMOVE AIRCRAFT PARTS FROM ASTORS, ASSEMBLY LINE, AND PRIME SHOPS TO MAKE COMPONENT EXCHANGES). EMPLOYEES WHO ASSEMBLED KITS WERE NOT FAMILIAR WITH THE GENERAL APPEARANCE, FUNCTION, OR CONDITION OF PARTS FOR SPECIFIC AIRCRAFT. NO ONE GROUP WAS TOTALLY RESPONSIBLE FOR COMPLETE KITTING IN SUPPORT OF THE ASSEMBLY LINE WHICH CAUSED MASSIVE DISRUPTION BY MECHANICS AND SUPERVISORS. THE CONSENSUS WAS THAT THE RESPONSIBILITY FOR KITTING COMPLETENESS AND TIMELY DELIVERY SHOULD BE ASSIGNED TO ASTORS.

CURRENT STATUS - CURRENTLY THE TRAINING OF MATERIAL EXPEDITORS, PRODUCTION CONTROLLERS AND VERIFIERS HAS BEEN COMPLETED. THE COMMUNICATIONS BETWEEN ASTORS AND SHOPS CONTINUES TO IMPROVE BECAUSE OF THE CONCENTRATED EFFORT.

# AUTOMATED STORAGE AND RETRIEVAL SYSTEM FUNCTION

## BACKGROUND INFORMATION

RESPONSIBLE DELIVERY OF COMPLETE KITS  
EMPLOYEES UNFAMILIAR WITH PARTS FOR KITTING

## CURRENT STATUS

TRAINING COMPLETE  
IMPROVED COMMUNICATION  
DELIVERY OF MATERIAL  
STRIVING FOR 95-100% PALLET FILL

## OBSERVATIONS

KITTING REQUIREMENTS INCREASING

THE DIR, MAINT. TRANSPORTATION REQUIREMENTS HAVE STABILIZED. THIS INCLUDES THE DELIVERY OF MATERIAL FROM DIR, SUPPLY TO DIR, MAINT. WE HAVE GREATLY IMPROVED THE RESPONSIVENESS FROM THE TIME THE MATERIAL IS MADE AVAILABLE FOR DELIVERY TO THE TIME IT IS RECEIVED BY THE USER.

WE ARE STILL STRIVING FOR 95-100% PALLET FILL. CURRENTLY THE LEVEL OF FILL IS 80-85%. CHANGES ARE PRESENTLY BEING WORKED ON TO HELP IDENTIFY ITEMS THAT REALLY NEED TO BE STORED IN ASTORS. AN IPR WAS HELD THIS MONTH TO IDENTIFY AND RESOLVE PROBLEMS THAT ARE STILL WITHIN THE ASTORS SYSTEM. ONE OF THE MANAGEMENT IMPROVEMENT ACTIONS BEING CONSIDERED IS THE FEASIBILITY OF A NIGHT SHIFT IN ASTORS TO PREPOSITION PARTS FOR THE ASSEMBLY LINE.

OBSERVATIONS - THE MOST SIGNIFICANT OBSERVATION IS THAT THE REQUIREMENTS FOR THE ASSEMBLY OF OVERHAUL KITS CONTINUE TO INCREASE. THIS IS ALSO PART OF THE MAINTENANCE SHOPS FLOUR SYSTEM (MSFS) AND WILL BE USED FOR THE SYSTEMS REQUIREMENTS IN THE KITTING MODULE.

ARE THERE ANY QUESTIONS?

IF NOT THIS CONCLUDES MY BRIEFING.

GOOD MORNING SIR!

I AM ERROL HERWIG, I AM A MEMBER OF THE STEP DESIGN GROUP. I AM ALSO THE ACTION OFFICER ON THE TRANSFER OF THE FORECAST FUNCTION FROM MAINTENANCE TO SUPPLY.

THE FORECASTING FUNCTION WAS MOVED INTO SUPPLY DURING JAN 83 AS SCHEDULED -- 8 OF THE 24 SPACES TRANSFERRED WERE VACANT. ALL 3 OF THE SUPERVISOR POSITIONS WERE VACANT.

THE SUPERVISORY JOB DESCRIPTIONS WERE EVALUATED AND RE-WRITTEN IN KEEPING WITH THE INTENT OF THE STEP RECOMMENDATION. THE 3 SUPERVISORS' SPACES WERE FILLED DURING JULY. THOSE NEW SUPERVISORS THEN RESTRUCTURED AND REDEFINED THE DUTIES OF THE FUNCTIONAL POSITIONS WITHIN THEIR SECTION. WE EXPECT TO FILL ALL OF THE VACANCIES DURING NOV 83.

GAINING THIS FUNCTION WITHOUT SUPERVISORS AND FULLY TRAINED PERSONNEL HAS DELAYED THE IMPROVEMENTS WHICH WE HOPED TO ACCOMPLISH IMMEDIATELY. WE ARE EXPERIENCING SOME STEP LADDER EFFECTS DUE TO THE PROMOTIONS MADE FROM WITHIN THE SECTIONS. THE RESULTING PERSONNEL TURBULENCE DUE TO THESE PROMOTIONS WILL TAKE A WHILE TO SMOOTH OUT. HOWEVER, THE QUALITY GAINS WHICH WOULD HAVE BEEN REALIZED BY RUSHING TO FILL THE VACANCIES

NOT WITHSTANDING THOSE VACANCIES, THE MAJOR BENEFIT WE HAVE REALIZED IS THE AWARENESS THAT MRL REVIEWS WHILE BEING OF LONG TERM VALUE, REQUIRED IMMEDIATE ACTION. STEP AND THE ROLE CHANGE OF THE FORECASTERS, RAISED THE MRL REVIEW AND THE PHENOMENA IS THAT BOTH CCAD AND THE MRC REALIZE THE LONG TERM IMPACT OF THESE REVIEWS AND ARE NOW FULLY RESOURCING THEM.

THE LAGGING, LOW PRIORITY FY83 REVIEW SCHEDULES WERE ACCELERATED AND COMPLETED AHEAD OF THE ORIGINAL SCHEDULE. AVSCOM INITIALED A MRL REVIEW MEMORANDUM OF UNDERSTANDING WITH CCAD, AND EVEN THOUGH NEGOTIATIONS FOR FY84 SCHEDULES ARE NOT COMPLETE, WE JUST COMPLETED A 2-WEEK REVIEW ON THE T53-L13 BA TURBINE ENGINE. PAUL HENDRICKSON, CHIEF OF AIRCRAFT SYSTEMS DIV, AVSCOM HEARLDED THE MRL RESULTS AND IS PREPARED TO FULLY RESOURCE THEM. THIS EQUATES TO APPROXIMATELY 8 TO 10 THOUSAND HOURS OF TDY TIME.

A DEFENSE LOGISTICS, AGENCY REPRESENTATIVE FROM PHILADELPHIA ATTENDED A PORTION OF THE T53 ENGINE REVIEW. THEY HAVE NEVER PREVIOUSLY BEEN INVOLVED IN DEPOT LEVEL PARTS REQUIREMENTS COMPUTATIONS. THIS SHOULD IMPROVE THEIR OVERALL WEAPON SYSTEMS SUPPORT TO ARMY AVIATION.

REPAIR PARTS FORECASTING FUNCTION  
TRANSFER OF SPACES

BACKGROUND INFORMATION

JAN 83 - ORGANIZATION TRANSFER ACCOMPLISHED AS SCHEDULED

24 - SPACES TRANSFERRED

8 - SPACES WERE VACANT

ALL SUPERVISOR SPACES WERE VACANT

CURRENT STATUS

REDEFINED SUPERVISOR JOB REQUIREMENTS

SUPERVISOR SPACES FILLED JULY 83

RESTRUCTURED AND REDEFINED FUNCTIONAL POSITIONS

5 - SPACES VACANT

THE MRL REVIEWS DID NOT REDUCE REPAIR PARTS REQUIREMENTS BUT HAS INCREASED THEM SUBSTANTIALLY. THIS INCREASE TRIGGERED IMMEDIATE PROCUREMENT REQUESTS BY THE MRC. THE MRL REVIEW PROCESS WHERE THE MECHANIC, PC, IM, ENGR, QUALITY AND SUPPLY PERSONNEL WALK THRU THE REPAIR PROCESS ITEM BY ITEM, IS A FAR MORE PRAGMATIC APPROACH THAN THE EARLIER EFFORTS WHERE THESE INDIVIDUALS WORKED IN ISOLATION, DEFINING OR CHANGING REQUIREMENTS.

REPAIR PARTS FORECASTING FUNCTION  
MATERIEL REQUIREMENTS LIST REVIEWS (MRL)

BACKGROUND INFORMATION

FY 83 MRL REVIEWS LACKED FUNDING AND EMPHASIS

CURRENT STATUS

MRC CHANGED FROM PASSIVE TO ACTIVE

MRC INITIATED MRL MCL WITH CGAD

MRC ACCELERATED AND FUNDED SCHEDULED REVIEWS

OBSERVATIONS

MRL REVIEWS NOW CONSIDERED VITAL FOR MATERIEL SUPPORT

MRL REVIEWS NOW MUCH MORE SUCCESSFUL AND COMPREHENSIVE

DLA INVOLVEMENT PLANNED FOR FUTURE REVIEWS



STEP RECOMMENDED THAT THE FORECASTERS SHOULD BE A DIRECT LINK AND BE LOCATED IN CLOSE PROXIMITY TO THE SHOP PRODUCTION CONTROLLER.

THE AIRFRAME AND COMPONENT FORECAST SECTIONS ARE CO-LOCATED GEOGRAPHICALLY BETWEEN THE AIRFRAME AND COMPONENT SHOP DIVISION. THIS IS IDEAL DUE TO THE CONSTANT INTERFACE BETWEEN THESE ELEMENTS. THE ENGINE SECTION HAS NOT BEEN RELOCATED TO-DATE.

PRESENTLY, ALL SUITABLE LOCATIONS ARE OCCUPIED BY OTHER ELEMENTS WHICH ALSO REQUIRE CLOSE PROXIMITY. THE FORECASTERS AND THE WRENCH TURNER WHO IN THIS CASE IS THE SHOP PRODUCTION CONTROLLER MUST WORK TOGETHER, AND CANNOT DUE TO THE DISTANCE BETWEEN WORK SITES. THIS MOVE IS CONTINGENT UPON RESOLUTION OF SPACE SHORTAGE.

REPAIR PARTS FORECASTING FUNCTION

RELOCATING FORECASTERS

BACKGROUND INFORMATION

FORECASTERS SHOULD BE DIRECT LINK  
TO SHOP PRODUCTION CONTROLLER

CURRENT STATUS

AIRFRAME AND COMPONENTS SECTIONS ARE  
CENTRALLY LOCATED

ENGINE SECTION NOT RELOCATED TO DATE

OBSERVATIONS

RELOCATION AWAITING RESOLUTION OF SPACE PROBLEMS

PRESHOP ANALYSIS (PSA) FUNCTION

ONE OF THE STEP RECOMMENDATIONS WAS TO MOVE AIRFRAME PRESHOP ANALYSIS BRANCH FROM DIRECTORATE OF MAINTENANCE TO THE DIRECTORATE FOR QUALITY ASSURANCE.

BACKGROUND INFORMATION

AIRFRAMES PSA WAS ASSIGNED TO MAINTENANCE QUALITY CONTROL DIVISION EFFECTIVE 16 JANUARY 1983.

ENGINES PSA WAS ASSIGNED TO MAINTENANCE QUALITY CONTROL DIVISION EFFECTIVE 14 AUGUST 1983. THIS CHANGE WAS NOT A STEP RECOMMENDATION, BUT WAS THE RESULTS OF A TSARCOM (AVSCOM) QUALITY EVALUATION OF CCAD CONDUCTED 10 THRU 26 JANUARY 1983. REASONS FOR THIS MOVE WAS TO STANDARDIZE THE PSA ORGANIZATIONAL STRUCTURE.

CURRENT STATUS

ALL MILESTONES ACCOMPLISHED WITH NO PROBLEMS.

ALL COMMENTS EXPRESSED HAVE BEEN POSITIVE.

PSA SUPERVISORS ATTEND WEEKLY MAINTENANCE QUALITY CONTROL MEETINGS.

OPEN DISCUSSIONS PERTAINING TO PRODUCTION/QUALITY PROBLEMS, PROGRESS, SCHEDULES.

OVERTIME USAGE BY PSA HAS BEEN REDUCED BY

FILLING VACANT PSA POSITIONS

ABILITY TO BORROW G.C. INSPECTORS TO FILL AN URGENT PSA TASK -

BOTH QC AND PSA REPORT TO SAME SUPERVISOR.

BETTER COMMUNICATIONS BETWEEN PSA EVALUATORS, QC INSPECTORS, AND MAINTENANCE PERSONNEL.

PROBLEMS

NO PROBLEMS SURFACED DURING THIS MOVE.

MANY PSA EVALUATORS WERE RECRUITED FROM THE QC WORK FORCE.

# PRESHOP ANALYSIS (PSA) FUNCTION

## BACKGROUND INFORMATION

AIRFRAME PSA BRANCH ASSIGNED TO MAINTENANCE QUALITY CONTROL DIVISION - 16 JAN 83  
ENGINE PSA BRANCH ASSIGNED TO MAINTENANCE QUALITY CONTROL DIVISION - 14 AUG 83

## CURRENT STATUS

ALL MILESTONES COMPLETED  
ALL COMMENTS POSITIVE  
PSA BRANCH CHIEFS ATTEND WEEKLY MAINTENANCE QUALITY CONTROL MEETINGS  
OPEN DISCUSSIONS PERTAINING TO PRODUCTION/QUALITY PROBLEMS, PROGRESS, SCHEDULES  
O/T USAGE REQUIREMENTS REDUCED  
BETTER COMMUNICATIONS

## PROBLEMS

NONE AT THIS TIME

DEFECTS

ONE OF THE SIDE EFFECTS AS A RESULT OF PSA MOVING TO QC IS SHOWN ON THIS CHART (TRANSP #2).

DEFECTS WRITTEN BY THE QC INSPECTORS AFTER PSA EVALUATION AND SUBSEQUENT STRUCTURAL REPAIRS ARE REFERRED TO AS "PSA OVERSIGHT".

THESE DEFECTS ARE WRITTEN IN THE AIRFRAME STRUCTURES AND TAILBOOM SHOP AND ARE PLOTTED ON THE UH-1 STRUCTURE DIAGRAM.

THE 3 MOST REPETITIVE TYPES OF DEFECTS NOTED ARE

RED - CRACKS

GREEN - CORROSION

BLUE - MISSING, WRONG PARTS OR INSTALLED IMPROPERLY

THIS CHART WILL BE USED DURING JOINT MEETINGS BETWEEN PSA EVALUATORS AND QC INSPECTORS

TO DETERMINE IF PSA EVALUATION IS ADEQUATE

ARE THERE PROBLEMS WITH DMWR - TECHNICAL DATA

ARE WE GOLDPLATING INSPECTIONS

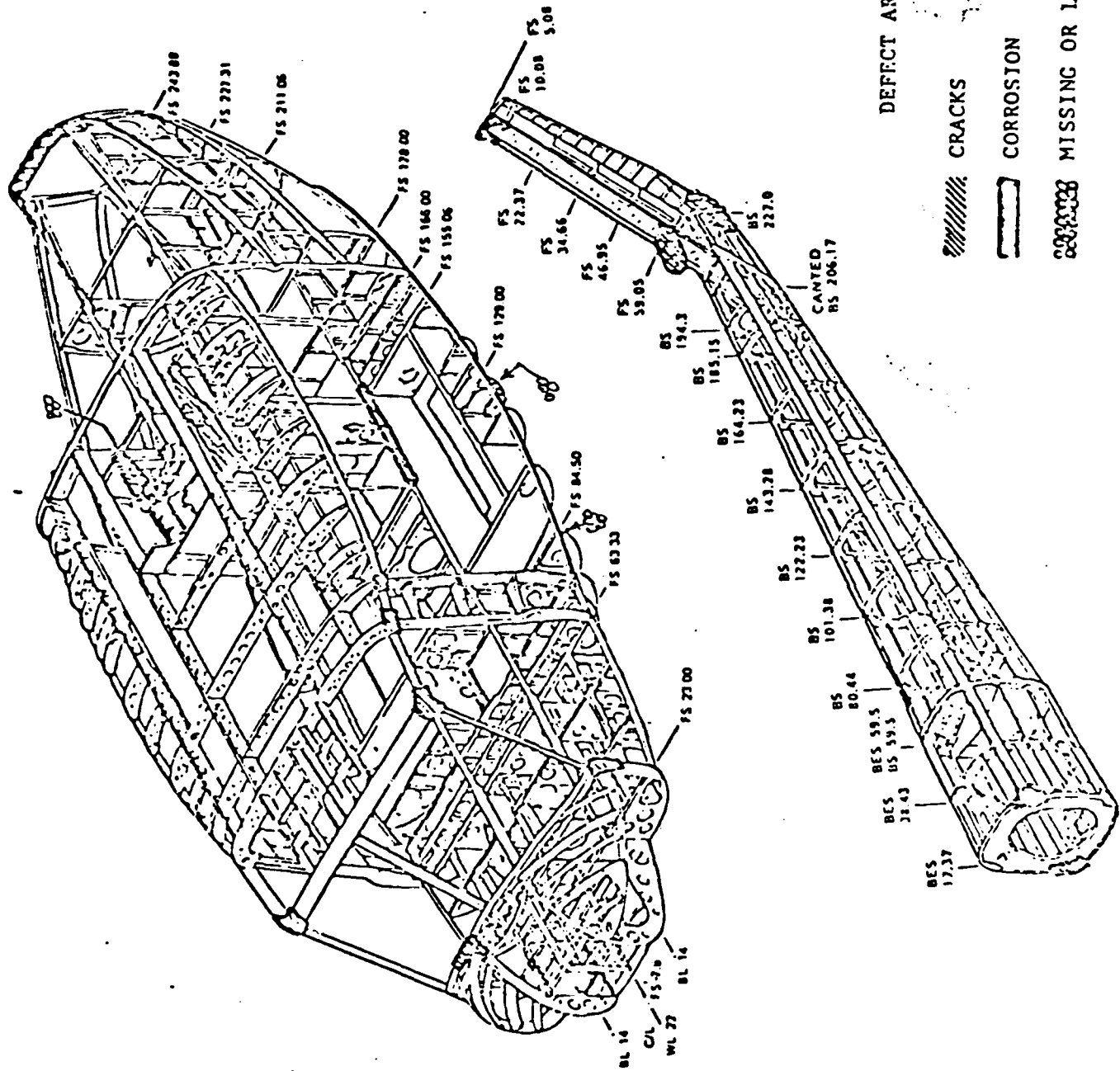
ARE WE OVERPROCESSING PRODUCT.

CONCLUSION

THIS PROGRAM OF PLOTTING DEFECTS WILL BE EXPANDED TO INCLUDE ANALYZING REPETITIVE DEFECTS ON OTHER AIRCRAFT SUCH AS OH-58, AH-1 AND CH-47.

WE HAVE NOTED A 10% DECREASE IN DEFECTS, RESULTING IN A REDUCTION OF REWORK MANHOURS.

IT IS OUR OPINION THAT THE MOVE OF PSA TO QUALITY CONTROL WAS COST EFFECTIVE AND A WISE MANAGEMENT DECISION.





GOOD MORNING -

I AM MARY MARTINEZ OF THE RECRUITMENT AND PLACEMENT BRANCH, CIVILIAN PERSONNEL DIVISION. MY OFFICE IS RESPONSIBLE FOR IMPLEMENTATION OF TWO STEP RECOMMENDATIONS.

THE FIRST ONE I WANT TO BRIEF YOU ON THIS MORNING IS PERFORMANCE TESTING.

ONE OF THE STEP INITIATIVES RESULTED IN THE DECISION TO BEGIN USING PERFORMANCE TESTING AS ONE OF THE CANDIDATE EVALUATION MEASURING INSTRUMENTS WHEN CONSIDERING CANDIDATES FOR PROMOTION TO AIRCRAFT MECHANIC POSITIONS IN THE AIRFRAME SHOPS DIVISION OF THE DIRECTORATE FOR MAINTENANCE.

DUE TO THE AMOUNT OF TIME WE KNEW IT WOULD TAKE TO CONDUCT THE JOB ANALYSIS AND DEVELOP THE TEST, IT WAS ALSO DECIDED TO CONTRACT OUT THIS PORTION OF THE PROJECT.

THE SCOPE OF WORK PACKAGE WAS COMPLETED BY CIVILIAN PERSONNEL DIVISION AND SUBMITTED TO PROCUREMENT DIVISION ON 1 JULY. ESTIMATED COST OF THE CONTRACT IS BETWEEN \$8,000 AND \$10,000. THIS INCLUDES:

- A. CONDUCTING A JOB ANALYSIS TO IDENTIFY KNOWLEDGES, SKILLS AND ABILITIES REQUIRED FOR SUCCESSFUL JOB PERFORMANCE.
- B. DETERMINING WHICH MEASURING INSTRUMENT IS APPROPRIATE TO MEASURE EACH KSA AND ASSIGNING WEIGHTS TO THE VARIOUS MEASURING INSTRUMENTS.
- C. DEVELOPING THE PERFORMANCE TEST AND THE ORAL INTERVIEW QUESTIONS.
- D. DEVELOPING THE SCORING PROCEDURE.

PROCUREMENT DIVISION IS ACCEPTING BID PROPOSALS AT THIS TIME AND ESTIMATES HAVING A CONTRACT AWARDED IN LATE NOVEMBER.

WE DO NOT ANTICIPATE ANY PROBLEMS IN THE IMPLEMENTATION OF THIS RECOMMENDATION.

## PERFORMANCE TESTING

### BACKGROUND INFORMATION

TEST TO BE DEVELOPED FOR AIRCRAFT MECHANIC POSITIONS IN AIRCRAFT SHOPS DIVISION  
JOB ANALYSIS AND TEST DEVELOPMENT TO BE CONTRACTED OUT

### CURRENT STATUS

SCOPE OF WORK PACKAGE COMPLETED AND FORWARDED TO PROCUREMENT DIVISION ON 1 JULY 1983  
CONTRACT PROJECTED TO BE AWARDED IN MID TO LATE NOVEMBER 1983

### PROBLEMS

NONE AT THIS TIME

ANOTHER STEP INITIATIVE RESULTED IN THE DECISION TO IMPLEMENT ON A TEST BASIS THE UNDERSTUDY CONCEPT WHEN FILLING SUPERVISORY POSITION VACANCIES.

AN UNDERSTUDY IS ONE WHO IS COMPETITIVELY SELECTED FOR THE PURPOSE OF BEING TRAINED TO ASSUME THE DUTIES OF A POSITION SCHEDULED TO BE VACATED IN A DEFINITE PERIOD OF TIME, USUALLY ONE YEAR OR LESS. NON-COMPETITIVE PROMOTION OF THE INCUMBENT TO THE TARGET POSITION MAY BE EFFECTED WHEN IT BECOMES VACANT PROVIDED THE EMPLOYEE HAS DEMONSTRATED THE REQUIRED QUALIFICATION LEVELS. IF THE EMPLOYEE IS NOT PROMOTED, HE MUST BE REMOVED FROM THE UNDERSTUDY POSITION THROUGH ADVERSE ACTION PROCEDURES.

THE MAIN BENEFIT THAT WE EXPECT TO DERIVE FROM THE USE OF THE UNDERSTUDY CONCEPT IS THAT UPON PROMOTION TO THE TARGET POSITION, WE SHOULD HAVE A FULLY TRAINED SUPERVISOR READY TO PERFORM FULL SCOPE SUPERVISORY DUTIES. WE ALSO THINK THE UNDERSTUDY CONCEPT WILL ELIMINATE CHARGES OF GROOMING, FAVORITISM AND PRE-SELECTION THAT WE ARE CURRENTLY EXPERIENCING WHEN FILLING SUPERVISORY POSITIONS.

REGARDING CURRENT STATUS ON THIS PROJECT, THE CHIEF, AIRFRAME SHOPS DIVISION HAS IDENTIFIED THE POSITION OF SHEETMETAL MECHANIC FOREMAN, WS-10, AS THE ONE TO BE UNDERSTUDIED. THE UNDERSTUDY POSITION HAS BEEN ESTABLISHED AS A SHEETMETAL MECHANIC FOREMAN, WS-9, ONE GRADE BELOW THE TARGET POSITION.

RECRUITMENT ACTION HAS BEEN INITIATED, AND THE PROMOTION BULLETIN ADVERTISING THE POSITION VACANCY HAS BEEN PUBLISHED AND DISTRIBUTED.

ESTIMATED DATE FOR ISSUANCE OF A REFERRAL LIST TO THE SELECTING OFFICIAL IS THE LATTER PART OF NEXT MONTH.

AGAIN, WE DO NOT ANTICIPATE ANY PROBLEMS IN THE IMPLEMENTATION OF THIS RECOMMENDATION. ARE THERE ANY QUESTIONS?

THIS CONCLUDES MY BRIEFING. THANK YOU.

## UNDERSTUDY POSITION

### BACKGROUND INFORMATION

UNDERSTUDY IS ONE SELECTED TO TRAIN TO ASSUME DUTIES OF THE TARGET POSITION.  
NON - COMPETITIVE PROMOTION TO THE TARGET MAY BE EFFECTED.

### CURRENT STATUS

POSITION TO BE UNDERSTUDIED HAS BEEN IDENTIFIED.

UNDERSTUDY POSITION BEING ESTABLISHED AS SHEETMETAL MECHANIC (A/C) FOREMAN, WS-9.  
ESTIMATED DATE FOR ISSUANCE OF REFERRAL LIST IS MID-NOVEMBER.

### PROBLEMS

NONE AT THIS TIME.

DEAD-END JOB PROGRAM

OUR DEAD-END JOB PROGRAM IS DESIGNED TO MOVE EMPLOYEES OUT OF POSITIONS HAVING NO PROMOTIONAL POTENTIAL TO THOSE WITH A LADDER OF PROGRESSION.

TO DATE, WE HAVE SURVEYED 5 WORK CENTERS DESIGNATED BY POSITION MANAGEMENT AND CLASSIFICATION AS HAVING DEAD-END POSITIONS. A TOTAL OF 112 EMPLOYEES HAVE CHOSEN TO PARTICIPATE IN THE PROGRAM.

WITH THE ASSISTANCE OF THEIR SUPERVISORS, THESE EMPLOYEES COMPLETED INDIVIDUAL DEVELOPMENT PLANS AND INDICATED POSITIONS TO WHICH THEY DESIRED REASSIGNMENT. THEY WERE ALSO ENROLLED IN CORRESPONDENCE COURSES COMMENSURATE WITH THEIR JOB INTEREST. A LIMITED NUMBER OF DETAILS WERE ALSO EFFECTED.

A LISTING OF THESE EMPLOYEES WAS PREPARED, AND IS MAINTAINED. THOSE WHO ARE MINIMALLY QUALIFIED ARE REFERRED TO SUPERVISORS WITH VACANCIES, AND 29 HAVE BEEN REASSIGNED TO DATE.

ONLY PROBLEM ENCOUNTERED IS THAT OCCASIONALLY DETAILS ARE DELAYED FOR WORKLOAD REASONS.

REASSIGNED EMPLOYEES ARE MORE SATISFIED. SUPERVISORS ARE COOPERATING TO MAKE PROGRAM A SUCCESS.

# DEAD-END JOB PROGRAM

## BACKGROUND INFORMATION

PROGRAM TO ASSIST EMPLOYEES IN BEING REASSIGNED FROM POSITION WITH  
NO PROMOTION  
POTENTIAL TO ONE FAVORABLE FOR PROGRESSION

## CURRENT STATUS

INTEREST SURVEYS COMPLETED IN FIVE WORK CENTERS  
ENROLLED PARTICIPANTS IN CORRESPONDENCE COURSES  
EFFECTED LIMITED NUMBER OF EXPERIENCE DETAILS

## IMPLEMENTATION PROBLEMS

WORKLOAD SOMETIMES DELAYS DETAILS

## FEEDBACK

REASSIGNED EMPLOYEES ARE ELATED  
SUPERVISORS ARE COOPERATING TO MAKE PROGRAM A SUCCESS

DURING BOTH OUR SOCIAL AND OUR TECHNICAL ANALYSES, ONE OF THE THINGS THAT WAS MOST APPARENT WAS A STRONG FEELING AMONG BOTH SUPERVISORS AND NONSUPERVISORS THAT OUR TRAINING FOR SUPERVISORS AND MANAGERS WAS HOPELESSLY INADEQUATE. WE SEEMED POWERLESS TO IMPROVE UPON THE TRAINING BEING OFFERED DUE TO THE PROHIBITIVE COSTS ASSOCIATED WITH INCREASING TDY TRAINING OPPORTUNITIES, AND THE FACT THAT THE COURSES OFFERED BY VARIOUS TRAINING INSTITUTIONS WERE NOT ALL INCLUSIVE OF OUR NEEDS.

VII-44

STEP SOLVED THESE PROBLEMS BY DESIGNING OUR OWN SUPERVISORY/MANAGEMENT TRAINING PROGRAM. THIS PROGRAM HAS NO TDY COSTS ASSOCIATED WITH IT DUE TO THE FACT THAT ALL COURSES WILL BE OFFERED ON-SITE. THE COURSES WILL BE TAILORED TO OUR OWN UNIQUE NEEDS, RATHER THAN THE GENERALIZED COURSES CURRENTLY AVAILABLE. UNDER THIS PROGRAM WE CAN TRAIN 20 SUPERVISORS AT ONE TIME; AND IN THE COURSE OF A YEAR WE WILL HAVE TRAINED FROM 20 TO 60 PEOPLE, IN A GIVEN COURSE, FOR LESS THAN IT PREVIOUSLY COST US TO TRAIN ONLY A FEW. AND THE BEAUTY OF IT IS THAT THEY WILL BE TRAINED IN EXACTLY THE AREAS WHERE WE NEED THEM TO BE TRAINED.

THIS PROGRAM WILL BE IMPLEMENTED ON 1 JAN 84.

THERE ARE NO PROBLEMS AT THIS TIME.

# SUPERVISORY/MANAGEMENT TRAINING

## BACKGROUND INFORMATION

SUPERVISORS AND MANAGERS INADEQUATELY TRAINED  
TDY COSTS PROHIBITIVE TO INCREASING TRAINING  
COURSES OFFERED NOT ALL-INCLUSIVE OF OUR NEEDS

## CURRENT STATUS

SUPERVISORY/MANAGEMENT TRAINING PROGRAM DESIGNED  
NO TDY COSTS  
COURSES TAILORED TO OUR UNIQUE NEEDS  
MORE INDIVIDUALS WILL BE TRAINED  
IMPLEMENTATION DATE OF 1 JAN 84

## PROBLEMS

NONE AT THIS TIME



**EVALUATION OF THE  
SOCIO-TECHNICAL EVALUATION PROGRAM (STEP)  
AT THE CORPUS CHRISTI ARMY DEPOT  
BY THE  
U.S. ARMY RESEARCH INSTITUTE**

**DR. PAUL VAN RIJN  
OCTOBER 1983**

# **ARMY RESEARCH INSTITUTE ROLE**

**MEMORANDUM OF UNDERSTANDING WITH DESCOM (1980) TO PROVIDE:**

**1. FORMATIVE EVALUATIONS**

**2. SUMMATIVE EVALUATION**

**AND TO**

**3. CONDUCT ORGANIZATIONAL RESEARCH**

## ARI APPROACH

### -MULTI-METHOD

- DIRECT OBSERVATION
- INTERVIEWS
- SURVEYS
- CCAD ARCHIVAL DATA

### -MULTI-LEVEL

- INDIVIDUAL
- WORK CENTER
- SECTION
- BRANCH
- DIVISION

### -PRIMARY FOCUS ON UH-1H

### -ASSESSMENT BEFORE, DURING, AFTER STEP

## ACCOMPLISHMENTS TO DATE

- PERIODIC FORMATIVE EVALUATIONS
- IDENTIFICATION OF ARCHIVAL DATA BASES
- CCAD EMPLOYEE SURVEY (DEC 82 AND JUNE 83)
- CCAD SUPERVISOR SURVEY (DEC 82)
- WORK CENTER SURVEY (MAR 83)
- FEEDBACK REPORT OF DEC 82 EMPLOYEE SURVEY
- AIRCRAFTSMAN ARTICLE (OCT 83)

## MEASURES

- ARCHIVAL MEASURES
  - NUMBER OF DEFECTS
  - PERFORMANCE EFFICIENCY (PE)
  - COMPLETENESS OF KITTING
  - TURNAROUND TIME
  - MANHOURS/UH-1H
  - PERSONNEL (E.G., SICK LEAVE, AWARDS)
  - DIRECT/INDIRECT LABOR
  - OVERTIME
- SURVEYS
  - COMPARISON OF DEC 82 AND JUNE 83 SURVEYS
  - HANDWRITTEN COMMENTS ON JUNE 83 SURVEY
- OBSERVATIONS

## PROBLEMS WITH ARCHIVAL MEASURES

- UNRELIABLE REPORTING
- DATA DOES NOT TRACK
- SUBJECT TO DISTORTION
- MIXED LEVELS OF ANALYSIS
- VARIABLE TIME FRAMES
- CONTAMINATION BY OTHER FACTORS, E. G.,
  - INSPECTOR ROTATION
  - SHOP FLOOR SYSTEM
  - NEW HIRES
  - TRAINING
  - OT DIRECTIVES
  - CHANGING STANDARDS
  - SPECIAL PROJECTS
  - VARIABILITY OF A/C
- INTERACTION OF NEARLY 60 WORK CENTERS
- COSTS/BENEFITS OF MEASUREMENT

**ARCHIVAL DATA**

**FINDINGS:**

**- RESULTS ARE MIXED**

**- NO DISCERNABLE RELIABLE CHANGE AT  
THIS TIME THAT CAN BE ATTRIBUTED TO  
STEP.**

# SURVEY RESULTS-BACKGROUND

## THE SURVEY

OVER 100 QUESTIONS BASED ON THE CLASSICAL RESEARCH  
LITERATURE OF ORGANIZATIONAL CHARACTERISTICS AND CHANGE

## ADMINISTRATIONS

DEC 82

- 300 EMPLOYEES
- GROUP ADMINISTRATION
- 84% RESPONSE RATE
- 9% OF SAMPLE LESS THAN 1 YR AT DEPOT
- 97% MALE

JUNE 83

- 600 EMPLOYEES
- MAILOUT
- 83% RESPONSE RATE
- 20% OF SAMPLE LESS THAN 1 YR AT DEPOT
- 91% MALE
- 51% TOOK DEC 82 SURVEY



## OVERALL SURVEY RESULTS

- NO OVERALL MEANINGFUL DIFFERENCES BETWEEN

- DEC 82 VS JUNE 83 EMPLOYEE PERCEPTIONS
- JUNE 83 SUPERVISORS VS EMPLOYEES
- JUNE 83 EMPLOYEES REPEATING SURVEY VS THOSE NOT REPEATING
- JUNE 83 EMPLOYEES DIRECTLY AFFECTED BY STEP VS THOSE NOT DIRECTLY AFFECTED BY STEP

## SPECIFIC SURVEY RESULTS I

### COMPARISON OF DEC 82 AND JUNE 83 QUESTIONS

% AGREE  
DEC 82    JUNE 83

18. WHO YOU KNOW COUNTS MORE THAN WHAT YOU KNOW	68	42
22. I MAKE MY OWN RULES TO GET MY JOB DONE	5	14
13. I CAN TAKE LITTLE ACTION WITHOUT SUPERVISORY APPROVAL	48	33
65. I EXPECT PRODUCTIVITY TO <u>DECREASE</u> DUE TO STEP	22	10
32. "RED TAPE" IS OFTEN A PROBLEM IN GETTING MY JOB DONE	51	37

## SPECIFIC SURVEY RESULTS II

### JUNE 83 QUESTIONS ONLY

% AGREE    % DISAGREE

67. I LIKE WHAT STEP IS TRYING TO DO	61	10
68. I LIKE WHAT STEP HAS DONE SO FAR	38	18
72. COMMUNICATION HAS IMPROVED DUE TO STEP	20	46
75. COMPLETENESS OF KITTING/PARTS HAS NOT CHANGED	53	18
92. VERIFIER HAS <u>INCREASED PRODUCTIVITY</u>	26	32
95. STEP REORGANIZATION HAS <u>INCREASED PRODUCTIVITY</u>	28	31
● THOSE INVOLVED DIRECTLY	59	36
● THOSE NOT INVOLVED DIRECTLY	7	28

## HANDWRITTEN COMMENTS ON JUNE 83 SURVEY

- 174 (29%) COMMENTORS
- 391 COMMENTS
- 516 COMMENTS WHEN SORTED INTO MULTIPLE CATEGORIES
- DISTRIBUTION AMONG 14 CATEGORIES

1. SUPERVISION	11%	8. PRODUCTIVITY	3%
2. MANAGEMENT	3%	9. MORALE	5%
3. MAINTENANCE VERIFIER	3%	10. STEP	9%
4. PERSONNEL	11%	11. SURVEY	4%
5. TRAINING	8%	12. JOB	7%
6. COMMUNICATION	3%	13. ALIENATION	15%
7. PARTS/TOOLS AVAILABILITY	8%	14. OTHER	10%

## SUBJECTIVE OBSERVATIONS

- HIGH MORALE AT CCAD
- HIGH LEVEL OF COOPERATION
- MAJOR ALLOCATION OF RESOURCES TO STEP
- PERCEPTIONS OF SUBOPTIMAL
  - PERSONNEL PRACTICES
  - SUPERVISION
  - TRAINING
  - COMMUNICATION
- POSITIVE "GUT FEELINGS" ABOUT STEP
- NEED FOR COHESION AND WORKING TOGETHER
- VERY STABLE WORKFORCE

## LESSONS LEARNED

- OBTAIN TOP MANAGEMENT SUPPORT
- USE "OUTSIDE" CONSULTANTS
- ENSURE GOOD COMMUNICATION/COORDINATION/DOCUMENTATION
- CONSULT SUBJECT MATTER EXPERTS EARLY
- MAINTAIN TASK ORIENTATION
- MINIMIZE VESTED INTERESTS
- IDENTIFY/DEVELOP MEASUREMENT SYSTEM EARLY
- CONSIDER RECOMMENDATIONS TO BE DYNAMIC, NOT STATIC
- CATEGORIZE RECOMMENDATIONS
- MAINTAIN REASONABLE AND LOW EXPECTATIONS
- ENSURE THAT IMPLEMENTATION SYSTEMS EXIST OR ARE DEVELOPED
- RETAIN CONSULTANTS THROUGHOUT IMPLEMENTATION

## INTERPRETATIONS

- IT IS TOO EARLY TO TELL, EFFECTS OF INTERVENTIONS (E. G., TRAINING) ARE LONG-TERM
- INTERVENTIONS FREQUENTLY SHOW INITIAL DROPS IN PERFORMANCE
- INADEQUATE MEASUREMENT PROCEDURES
- LARGE COMPLEX SYSTEMS REQUIRE GREATER EFFORT
- LIMITED CAPACITY FOR IMPROVEMENT
- PASSIVE NON-COOPERATION BY SOME

**WHERE DO WE GO FROM HERE?**

- CONTINUED IMPLEMENTATION/DIFFUSION OF STEP PHILOSOPHY
- CONTINUED DEFINITION OF PRODUCTIVITY MEASURES
- INCREASED FEEDBACK AND INCENTIVE SYSTEMS
- CONTINUED TRAINING
- CONTINUED TRACKING BY THE ARMY RESEARCH INSTITUTE



**"THERE ARE NO QUICK FIXES, AND NOTHING  
WILL SUBSTITUTE FOR CAREFUL PROBLEM ANALYSIS  
AND LONGTERM COMMITMENT TO PAINSTAKINGLY  
WORKED OUT SOLUTIONS."**

**JOHN P. CAMPBELL**

## APPENDIX C

### Representative Comments Received on the June 1983 Administration of the CCAD Employees Survey (WAVE 2)

(Slightly edited for clarity and readability)

#### SUPERVISION

Most of the supervision I have seen here is fair to poor.

Supervisors tend to spend too much time with only certain employees.

The morale is low because of the inability of our supervisor to recognize good quality workers and the good work they perform every day.... Our supervisor, ever since he took over our shop one and one-half years ago, has not handed out one SSPA, outstanding performance award, or even a letter of appreciation to anyone in our shop.... In other words, there isn't even one person in this shop worthy of an award.

...to get this Depot in a more productive way is to get better supervisors and section chiefs, not people who think of themselves first, then the Depot and workers.

Supervisors show favoritism openly.

We have an excellent supervisor, who is very helpful and gives special attention to each worker in the shop.

Supervisors need more training in human relations.

It is most important that the people selected for supervisory positions in the future are men and women who can motivate others to do a good job.

#### MORALE

Morale is at an all-time low and I don't see any help forthcoming now.

When you know that you are going to receive the same rating as a less -productive employee, no matter how hard you work or produce, it is demoralizing.

I don't believe there is any other place/shop I would rather work in. I am very satisfied.

## MANAGEMENT

Production in this work center will not increase if there are no changes made in top management. Constant harassment has decreased morale for the last year.

Not enough credit is given where credit is deserved, and we still have to keep morale high. It's who you know that counts.

Very poor management. We are told one day there will be no overtime and the next thing we are asked by our supervisors is if we want to work Saturday overtime.

I understand what STEP is, but until management gets its act together it will never work in the shops.

## ALIENATION

The mechanics have no say as to how the job should be done.

The morale here is real low because management thinks that the employees are machines. All they do is push, push, push. Not enough credit is given where credit is deserved.... There appear to be different rules for different people.

When you know that you are going to receive the same rating or a less productive employee, no matter how hard you work or produce, it is demoralizing.

## AVAILABILITY OF PARTS/TOOLS

We are still having trouble in getting a/c parts.

We still can't get enough parts to do our job. In fact we are cut back. Everything seems to get harder and harder.

Half of my time is spent chasing for parts and waiting.

My main complaint at this time is the laid-back attitude of some of our production controllers. If we need a part, we sometimes have to wait 2 to 4 hours to get the part and maybe reorder the part. They say they have to wait for a stack so that as not to make too many trips, even when 2 or 3 men are in the office, apparently able to go and get the part.

Why do we still have to get our own parts, when we have 5 or 6 we parts expeditors???

It is a gross waste of manpower for employees to move large work tables, work stands, fans, etc. along the assembly line with them. Each station should have the necessary items.

PRODUCTIVITY

I believe this project will work, if given a chance; and will improve production steadily as time passes.

Production has decreased through the reduction of a journeyman to a work leader. The work leader runs around talking to everyone in the hangar all day long--people of a different trade as well as his own. Morale has decreased because this person has a high-paying job with useless responsibilities.

To get more productive we need to promote supervisors who know how to motivate people. Most of the supervisors in the plant are not trained right, and most of them are certainly not leaders of men.

SURVEY

If these questions are completely confidential, why do you need my Social Security Number, shop name, and supervisor name?

Thank you for the opportunity to express myself.

Personally, I am very dissatisfied with this survey and I hope that this will be the last time that I have to fill one out.

TRAINING

Some of the supervisors look at the apprentices as helpers instead of training us for future journeyman positions.

I believe that if there were a program to better train mechanics, this Depot would be a more productive place than it is now.

In some areas, mechanics will not let you learn all of the work required because they don't want anyone else doing that job. What about when one of these mechanics goes on vacation or misses work?

I believe a class should be established on the assembly line to teach new employees the basics, like how to read a parts manual, how to order parts, etc.

I would like to get more training in the areas required for advancement. You are expected to know these areas, but you get no opportunity for training in them. I feel I would be a better employee.

I would like to see mechanics rotated on a regular basis within their trade, but in different shops. This would help expand the mechanic's knowledge of the overall mission in CCAD, as well as provide an expanded pool of broadly trained and experienced people.

New employees with no training in aircraft repair are left on their own to learn from either good mechanics or bad mechanics.

I am an apprentice and have been through many shops for training.

PERSONNEL

Job rotation into different work areas--NONE.

The people who are hard-working do not get promoted. We need more motivation on the lines, awards, and better supervision.

As a new employee, I don't think it is fair to do or start doing jobs that people have been doing for 10 to 15 years. I'm a fast learner, and as a WG5 am doing the same kind of job as a WG9 and get paid less.

My supervisor has a minimum amount of experience in my field and any problems must be explained in complete detail and even then he does not fully understand.

In the past, I have submitted several suggestions and only my supervisor has given me recognition. The Section Chief and Branch Chief have not given me any credit. They think I am only a working machine and do not appreciate me using my head.

Anyone can read our job description today and compare it with the one ten years ago and acknowledge that it is completely different. I know this won't be read, but maybe someone higher up will check it out.

FORMATIVE EVALUATION VII (JAN - MAY 84)  
OF THE SOCIO-TECHNICAL EVALUATION PROGRAM (STEP)  
AT CORPUS CHRISTI ARMY DEPOT

Paul van Rijn, Ph.D.  
U.S. Army Research Institute  
May 1984

SCOPE OF THE EVALUATION

This is the final formative evaluation and covers the period of December 1983 through the final STEP IPR at DESCOM Headquarters on 16 May 1984. It includes a 9-13 April 1983 site visit, whose primary purpose was the third administration of the Corpus Christi Army Depot Employee Survey. However the visit also involved interviews with key Depot personnel to determine their "bottom line" assessment of STEP. The 16 May IPR was to give the Commander, DESCOM a final update and assessment of STEP and to solicit final DESCOM approval on one of the STEP changes.

SURVEY ADMINISTRATION

Based on a March '84 employee roster, a 25 percent random sample was selected from all work centers directly involved in the STEP project. Because of their critical roles in the workflow and acquisition of parts, 50 percent random samples were selected from Pre-Shop Analysis, Quality Control, Production Control, Forecasting, and Material Staging and Kitting units. When the work center supervisor was not included in the random sampling, the supervisor's name was substituted for that of the nearest adjacent selected employee on the roster.

This sample represents a total of 380 employees and supervisors. The size of this sample was designed to be about half of the June 83 sample in order to minimize the burden on the Depot. Since the June 83 sample was a 50% sample, the current sample can be expected to include at least one-half of the employees who participated in June.

All surveys were batched and distributed with the lists of employees in the sample to each branch office for further distribution to the sections and then work centers. Pre-addressed return envelopes were attached to the surveys to permit confidentiality of responses. All surveys were returned through the internal Depot mail system to the Organizational Effectiveness Office for forwarding to ARI.

There was no apparent difference in the distribution of surveys from the procedures used in June 83, and within a matter of days the completed surveys were being returned. Unlike the June administration, however, the

initial response rate of 59% for this administration was considerably less than the June return rate of 84%. With the addition of a few "stragglers," the final response rate increased to 65%.

Although this response rate is not as high as anticipated, it was not so low as to warrant a second effort. Based on the first two administrations of the survey, there was no basis to assume that a larger number of respondents would significantly alter the survey results. Nevertheless, the results will need to be interpreted more cautiously.

The lower response rate is interesting in and of itself and may be a reflection of diminished interest in STEP. The analysis of the survey and comparisons with previous administrations will be contained in a separate report.

#### INTERVIEW AND OBSERVATIONS

Breakthrough '84. There were definite indications that the Depot had moved into a developmental phase beyond STEP. In the previous week, BREAKTHROUGH '84, a new change program, was initiated with full ceremonies including an Army Band, a 100 x 20 foot banner, a slogan, invited guests, and special awards for outstanding job performance.

Not unlike STEP, the focus of Breakthrough '84 was to increase productivity, quality and safety at CCAD. An important aspect of Breakthrough '84 was to focus the CCAD reward system directly on a set of productivity, safety and quality indicators that are important and meaningful to the mission of CCAD. These measures would be made highly visible through monthly publication in the Aircraftsman, and weekly printouts for each work center. This would permit a constant tracking of performance and would give the work centers almost instant feedback about their performance. The measures used are many of the same ones being assessed in ARI's evaluation of STEP, with some improvements.

CCAD Evaluation of STEP. Interviews with top managers and other key personnel clearly showed that the Depot had moved beyond STEP, although it was explicitly acknowledged that STEP's influences persist. Clearly, the spirit and the philosophy of STEP remain, as well as the systemic and operational changes that were made and are now nearly institutionalized.

Nevertheless, initial reactions to questions about STEP were sometimes negative. This emanated primarily from STEP's inability to demonstrate the increases in the productivity that CCAD had expected from STEP. It was openly acknowledged that STEP really did not have a chance considering the tremendous turmoil created by the other programs at the Depot.

Clearly, the evaluation of STEP was directly related to the expectations about STEP. Where the expectation was increased productivity, STEP was considered a failure, but where STEP was expected to change the way CCAD looked at itself and adapted to change, STEP was viewed as a success.

Most typically, STEP generated a number of expectations and to the extent these were met, STEP was a success. Consequently, the evaluations of STEP must be complex. The STEP principles were hailed, but the outcomes tended to be viewed with disappointment.

More than once it was noted that STEP did not adequately deal with the social aspects of the organization. Despite the extensive interviewing of employees during the social analysis, there was ultimately little that was done to enhance directly the motivation and participation of the majority of workers on the shop floor. Most of the social enhancements were at the level of mid-level and first-line supervisors, members of the STEP Design Group, and those individuals whose jobs and careers were directly enriched by STEP and STEP training.

Even where there was social enhancement, personality conflicts and infighting were not always most constructively resolved. At the lowest worker levels, much of this was not always directly relevant but the perceptions and rumor about the "politics" being played distinctly affected the morale of the work units and their attitudes toward management. A major complaint, and one reflected in a recent survey by the CCAD Organizational Effectiveness Consultant, was a desire for more information about what was happening at CCAD. Supervisors and top managers were seen to need more encouragement to talk with workers on the floor, accentuate the positive, give the bigger picture, and instill a sense of purpose.

Increased pay or grade alone were not considered long-term inducement to produce more or even to increased satisfaction. A new attitude or view needs to be developed. This requires training. Although much-needed, the STEP training should only be considered the beginning of a long term progressive and developmental program. Some of the STEP training may have been too much all at once.

STEP was viewed as a useful training device for the Depot by fostering a more systemic view of the organization, by encouraging participative management, innovation and change, and by enhancing proactive planning and problem solving. Specifically, the members of the STEP Design Group received a first-hand education in organizational management and to the extent they continue to apply this background to their jobs the Depot will inevitably benefit.

On more than one occasion, the observation was made that the STEP Design Group was too low-powered. Considering the magnitude of the system being analyzed, this may be a valid observation and higher-level working support might have ameliorated some of the difficulties encountered in the implementation phase. STEP and its implementation might also have been more successful if the entire impetus for STEP had come from within CCAD. Some felt that CCAD had been "volunteered" by DESCOM and might not on its own have ever felt the need to conduct a project of this scope.



The Depot was generally perceived as having gotten a lot of mileage out of STEP. STEP helped build cohesion, broke the centralization mold, and made it "ok" to be innovative. It helped set the stage to allow other changes. It, and programs like Breakthrough '84, showed that management cares.

The assessment of the impact of STEP as an organizational change technology is severely hampered by the dynamic and sometimes turbulent nature of CCAD and by its top-management turnover. Programs like STEP require a 6-7 year timeframe to reach their maximum potential. This is well beyond the tour of duty of a CCAD Commander and, since the Commander is so crucial to the program, seriously threatens the longevity of such a "non-mandatory" program.

Besides the turbulence of the organization, the government bureaucracy also seriously limits the potential usefulness of sociotechnical analysis. More than once was it remarked that the consultants were not sufficiently familiar with the tremendous number of constraints and regulatory requirements faced by a government military organization. CCAD just doesn't have the autonomy and flexibility to adjust and experiment as organizations in the private sector. Such inability to change rapidly makes it considerably more difficult for managers to sustain the momentum and enthusiasm.

Commander's Task Group or STEP Relook. In order to identify the problem areas that contributed most to the reported increases in manhours for the UH-1H line, the Director for Maintenance and the Commander virtually simultaneously reconvened the STEP Design Group to look into the problem. Due to the overlap of the directives and their differences, there was some initial confusion about the purpose of the task force and its role.

Eventually, it appeared that the Task Group had as a charter not only the investigation of the increased manhours but also a relook at the STEP-initiated changes. Appendix A contains the Task Group report and recommendations.

Briefly, the Task Group looked at the 56 work centers that charged manhours against the 16 UH-1Hs completed in December 1983. Of the 56, 21 exhibited large manhour increases. To further identify the source of the increase, 34 first-line supervisors were interviewed.

Based on these analyses, part of the problem appears to have been the loss of the Performance Efficiency (PE) ratings in June 1983. Because there was not sufficient documentation to support the manhour standards, CCAD suspended use of the standards and PE ratings. Without the ability then to monitor shop performance from month to month, manhour reporting lacked accountability and deteriorated accordingly. On hindsight, continued use of the "defective" standards would at least have permitted monthly comparisons to detect work centers with unwarranted manhour increases.

The Task Group noted considerable inconsistencies and inaccuracies in the reporting of direct and indirect hours, number of defects, and rework manhours. Maintenance Verifiers were perceived more as parts chasers and pre-inspection persons, contrary to their primary intended functions as good instructor mechanics. It was noted that "the audit trail for this position was diluted because of reorganization, influx of new personnel into the shops, MIS-Q system down, training requirements overload, and lack of commonality in the use of the verifier."

The production control function also had some difficulties. Production Controllers (PCs) were "spread too thin" and the pay structure was not sufficiently high to retain the quality people required by the position. There was a "lack of understanding in the day to day functions that controlled cost. . ." and "a lack of commitment in maintaining the discipline essential to foster integrity in a reporting system."

The Task Group made a number of recommendations. These included: 1) accelerate standards development and documentation and set work center goals, 2) develop highly visible and automated reports to permit performance management at all levels of the Depot, 3) conduct manpower studies to determine paper staffing levels, 4) conduct multi-disciplinary training, 5) clarify the roles of verifiers, controllers, supervisors, and inspectors and give refresher training, as needed, and 6) upgrade certain production control positions. To implement each recommendation, there was an implementation POC, various action elements, and reviewers/validators (from the Task Group).

The utilization of a Commander's Task Group draws high praise as an organizational diagnostic and problem solving tool. The Task Group concept fits in closely with the participative management approach advocated by sociotechnical systems theory. However, the confused tasking of the Group and their subsequent performance did not always show the benefits of what was learned during STEP.

More specifically, the tasking appeared vague and did not seem to be clarified by the Task Group. The primary problem was to identify increased manhours, yet the bulk of the findings pertained to matters which were not directly related to the problem. Responsibility appears to have been diffuse, e.g., it was not clear from the report who was included in the Task Group.

Although plagued by the same data problems as ARI, the data collection effort appeared more subjective and unsystematic than necessary. No tables and few figures were presented to support the findings or recommendations. The recommendations themselves tended to be imprecise, and three of three implementation POCs contacted claimed not to have had much input into developing the recommendations and admitted to not having a very good idea about either the meaning or intent of the recommendation they were charged to implement.

Such claims recall previous criticisms of the STEP Design Group for not coordinating more closely with "the experts" responsible for implementation. The apparent repetition of this oversight is reflected in the fashion with which both the POCs and Action Elements were identified in the report. Usually, no specific person was mentioned, only an office, or most typically an entire directorate.

Despite these shortcomings, the Task Group and other initiatives like it (e.g., a Depot-wide Quality Circle on safety) clearly show a Depot that has become more participative, more self-aware, and more adaptive to change. Efforts such as these can contribute significantly to morale, facilitate long-range planning, and can help the Depot adapt more smoothly to the changes required by the environment.

#### DESCOM IN-PROCESS REVIEW ON 16 MAY 1984

This was CCAD's final IPR for the Commander and Deputy Commander of DESCOM on the STEP project. Present for CCAD were the Commander, the Chief of Production, Planning and Control, and three members from the STEP Design Group. There was a representative from the DARCOM Productivity Office and ARI was represented by two researchers.

The CCAD Commander gave the briefing to give DESCOM his assessment of STEP prior to CCAD'S written final report and also to get final DESCOM approval of the organizational move of Forecasters from the Directorate of Maintenance to the Directorate of Supply. The Commander acknowledged that he had not been able to achieve or demonstrate all of the expected 2% gain in savings and attributed this in part to the many other changes that occurred at the Depot during the last few years, such as the special projects and the accession of 1200 new hires.

The CCAD Commander's remarks consisted of a discussion of the merits and problems associated with each of the STEP recommendations. These will be briefly summarized. The entire briefing is contained in Appendix B.

Aircraft Movers/Cleanup. This is working out well and saves a lot of mechanic time. Estimated savings are \$120,000 per year. The Commander, DESCOM, wondered if these workers might not be hired in two shifts so that they would also be able to clean up at the end of the day. Due to shift work and overtime, this was not considered practical. The Commander, DESCOM, suggested that these employees be hired as "on-calls" so as not to have them count against the FTP (full-time permanent) strength count.

Mechanic Certification/Performance Testing. The contract to develop a performance-based promotion test for mechanics had been awarded. The Commander, DESCOM, was very "glad to hear CCAD doing this." The Navy has been far ahead on this type of testing. Once understood by unions, performance testing is received very positively by unions.

Supervisor/Manager Training. A progressive sequential training program had been developed for the Depot and was beginning to be implemented. There was increasing demand and use for the Leadership and Management Development Course (LMDC) and the Supervisor Understudy program had filled its first position.

The DESCOM Commander was particularly supportive of the Understudy Program and recommended it be expanded. Although OPM (Office of Personnel Management) regulations permit competitive selections for understudy positions with later non-competitive promotions, these regulations become more restrictive at levels above first-line supervisors. Consequently, most expansion of this program will come at the lower levels.

Another important and useful management tool was the set of Guidance DFs designed to clarify the CCAD Philosophy Statement. This set of DFs was designed to further share with CCAD managers and supervisors the Commander's intent and to permit managers to make more informed and coordinated decisions.

Reduction of Dead-end Jobs. Out of the 50-60 jobs so designated, 34 persons had been counseled, trained or reassigned. Achieving the right balance of turnover and personnel development, however, is something that will take time.

Quality Assurance. It was difficult to quantify the positive results of the Maintenance Verifier on quality. The number of defects varied considerably from month to month with no apparent overall decrease. A comparison of all of Airframes Division against the UH-1H line only showed a parallel fluctuation of defects until early 1984. Since then, however, the UH-1H line showed a slight decrease in defects while the number of defects in Airframes increased slightly. This was interpreted to be the possible beginning of the payoff on the UH-1H line.

Per request, the DESCOM Commander was told that there was a change in the types of defects encountered. Mostly this consisted of a decrease in repetitive defects. It was noted this may be due to the new hires and that the "litmus test" of a decrease in defects would be to track costs per defect. Admittedly, this would be a real challenge. The DARCOM representative noted that dollars saved is the most compelling argument to convince management to invest in a productivity enhancement program.

The CCAD Commander indicated that the "jury was still out" on the Maintenance Verifier (MV) position but was optimistic that additional training of mechanics, more role clarification and participation of MVs in two Depot-wide quality circles would be very helpful.

Although the move of Production Controllers (PCs) to the Production, Planning, and Control Division was a real plus in terms of increased communication and better personnel utilization, its implementation had been mixed. The training of PCs was very well-received and was being extended to the Components and Engine Divisions. Due to the grade structure of PCs,

however, it had been difficult to attract and retrain the quality people needed in these positions. Some role clarification was also considered desirable. However, even with the difficulties, it had become easier to get things done, the flow of work was better than it had ever been, and parts availability and inventory controls were improving. The Maintenance Shop Floor System will be a "savior," but it must be kept up. Also, some of the PCs may have been put in their positions too early. The DESCOM Commander concurred and suggested that the grade structure problem needs to be resolved and exhorted the Shop Floor System "to work" and be "user friendly."

Move of ASTORS to PPC. Moving the Automated Storage and Retrieval function (ASTORS) to Production, Planning, and Control (PPC) was effective in stabilizing and increasing pallet and kitting fills up to 80%. Of the 20% difference, 10-15% of the variance was still due to CCAD's own inability to know its inventory. The Shop Floor System should help. More improvement was considered possible.

Move of Pre-Shop Analysis to Quality Assurance Directorate. This was a good move. It had led to greater communication between the examiners and quality inspectors and a more consistent interpretation of standards. The examiners now get direct feedback from the inspectors about their oversights. Rework hours had been reduced and the new reorganization permitted more cross-utilization of personnel.

There are current problems in Pre-Shop Analysis due to an OPM requirement to convert WN and WD positions to the GS scale. This will adversely affect 39 (of 43) encumbered positions covered by this regulation. DESCOM would like CCAD to help build a case to suspend this action.

Transfer of Forecasting from Maintenance to Supply Directorate. This was viewed as a real good move, had resulted in better planning, and permitted parts availability to increase while storage actually decreased.

#### CCAD Summary

The CCAD Commander summarized by saying that much of what STEP had done would be directly transferable to other Depots, e.g., the move of Forecasters, the training, the understudy program, and the development of a philosophy statement. If he had to do it again, he would do it on a smaller, more manageable level and would reduce the amount of turbulence simultaneously impacting on the project. DESCOM encouraged CCAD to tell its experiences to other Depots and to use a 29 May Conference at CCAD as an initial forum.

#### ARI Comments

The Commander, DESCOM, asked ARI to comment on its evaluation. In the limited time available, the points were made that CCAD is a better place today than it was two years ago and that despite difficulties in the assessment of change, the more intangible benefits have been considerable. With time, the more tangible increases in productivity and cost savings are

expected to become more apparent. A real plus coming out of STEP is an automated performance measurement system that will permit different levels of the organization to see more clearly, on a month-by-month basis, how they measure up on those indicators that are most meaningful of organizational progress and the accomplishment of CCAD's mission. The high visibility of these measures will permit instant feedback and when coupled (as intended) with appropriate performance awards can make a significant contribution to enhanced cohesion and productivity.

The Commander, DESCOM, concurred with the comments and wanted to know if ARI had a publication requirement and system. When informed that ARI had both, he invited ARI to call on him if assistance were needed in getting published.

#### IPR EVALUATION

The IPR was very professionally done and became increasingly more positive as it progressed. This may be attributed, in part, to the DESCOM Commander's clear grasp and understanding of the difficulties and complexities involved and his genuine appreciation of what had already been accomplished. It is expected that DESCOM will continue to support STEP type projects (perhaps on a smaller more manageable scale) and that some of the more successful aspects of STEP will be transferred quickly to other Depots.

APPENDIX A  
UH-1H MANHOUR STUDY

The objective of the Commander's Task Group was to identify the problem areas that contributed to a significant reported manhour increase in the production of the UH-1 DEX A1 aircraft. The group needed to retrieve first hand-information from the functional level to coincide it with the known factual information that was gathered. This recorded data reflected that the reported December completion of the UH-1H (DEX A1) aircraft indicated an average of 4400 manhours per aircraft. This represented a 745 manhour per aircraft(1) overrun of Extended Hours and approximately 1400 manhours per aircraft overrun of Standard Hours.(2) The December completion sample was selected for the following reasons:

1. Time constraints restricted the formulation of an acceptable base-line of 65 aircraft completions prior to STEP implementation and re-organizations.
2. The average manhour requirements for this sample period was 4400 manhours per aircraft, an all time high.
3. These completions possessed the least amount of carry-in hours which required the fewest amount of manhours in reconstructing records at the work center level.

Of the fifty-six work centers reporting hours expended against these sixteen aircraft completions, twenty-one work centers exhibited large man-hour increases or large percentage of manhour increases.(3) The areas in which the largest amount of manhour overruns were the Airframe Shops Division with 1380 manhours over, the Component Shops Division with 48 manhours over and the Quality Assurance Directorate with 130 manhours over. Even though forty-eight manhours might seem insignificant compared to the other divisions, the percentage of overruns to process parts in the Component Division was significant. Part of the overrun in the Quality Assurance Directorate was attributed to the new testing function.

Thirty-four first line supervisors were interviewed from the Airframe Shops Division, Component Shops Division and associated Directorate for Quality Assurance work centers. The survey interview included questions about cost variances and standards, staffing and proficiency levels of the affected work centers, Maintenance Verifier's contribution to increase or decrease of defects and rework manhours, Production Control support, impact of STEP changes, exchange of information that could have enhanced the manhour usage and performance and performance indicators.

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- 1 End Item Code Standards Index 01/31/84
  - 2 End Item Code Standards Index 01/31/84, SIF 30 Sep 81, interview Work Measurement Branch, Airframes and Components Section
  - 3 Carry-in: M01 JO/PCN Work Center Ledger dtd 30 Sep 83 and JO/PCN work center inquiries

FINDINGS



#### A. Staffing Levels and Experience of Personnel in Affected Work Centers

During the cost survey, work center supervisors from 5DC2A, 5DC2B and 5DB3A were interviewed and asked to rate their assigned personnel utilizing the following criteria:

- a. Outstanding: Can perform any aircraft maintenance task within the work center with no supervision or instruction.
- b. Average: Can perform tasks with some direct supervision or instruction for short periods of time.
- c. Below average: Cannot perform, assigned tasks without the aid of supervision or direct instruction.

The results of the evaluation process were very interesting. Of one hundred and thirty-eight WG-10s, fifty-three were in the outstanding category, twenty-five were not average but were not outstanding, so they were evaluated as above average, forty-two were rated average and ten below average. Of the seventy-three WG-08s, eighteen were rated outstanding, eleven were above average, thirty were average and four were below average. Of the seventy-nine WG-05s, four were rated outstanding, five above average, thirty-two average and five were rated below average. A total of fifty-one people were not rated because they were not directly involved with the UH-1 DEX AI program and a majority of those were new hires. New employees (those with less than three months) were not rated because shop foreman felt that it was premature to render an opinion. It was noted, however, that approximately ninety percent of the new hires had no aircraft experience. These totals did not include sheetmetal mechanics on the Assembly Line (5DB3A). The staffing levels used to rate were obtained from work center's current personnel rosters. A significant point in this survey was that of the people that were rated below average, a majority had more than three years in grade. Those personnel with less than three years experience that were graded below average felt that it was a supervisory and motivation problem rather than ability to perform. Nonetheless, these individuals did not feel any commitment for the compensation they received. Those personnel who were promoted in the prime shops, or were repromotion eligibles or transfers, were rated by the foreman as having no experience. This was reinforced by the personnel that requested voluntary down grades because there was too much pressure on the Assembly Line to meet schedules and just too much was expected of a WG-10 working that area. A WG-10 on the Assembly Line is expected to keep abreast of aircraft charges, quality of functions performed, crew performance, rework manhours and turnaround time. This is in his job description and his salary is commensurate.

#### B. Maintenance Verifier

The survey reflected the supervisors felt very comfortable with the Maintenance Verifiers because there was a perception that the verifier was decreasing defects and rework manhours. But, the perception did not coincide with

the MIS-Q reports. These reports showed a stable to slight increase in defects and rework manhours. A conclusion could not be validated because the manhours reported by the foreman, the manhours reported on the 1022 and the actual manhours reworked were not consistent.

To get a feel from the lowest functional level, a mechanic survey was also performed in the Structures (5DC20) and the Airframe Assembly (5DB30) Sections to extract the mechanic's perception of the Maintenance Verifier. The perception was that the verifier's primary function was to pre-inspect. Therefore, mechanics accepted him more readily because they saw a shift in the accountability for quality. A very high percentage of mechanics polled, related the Maintenance Verifier as a good parts chaser and a good pre-inspection person. A small percentage identified him as a good instructor or a super mechanic.

The Maintenance Verifier was introduced into the system as a innovative approach to the promulgation of quality both in the products produced and in the maintenance of skill level required to preserve continuity in producing quality products. It was not the intent to create a buffer to disguise the quality of work by pre-inspecting. Rather, he was to surveil his area and prevent defects and reduce rework manhours. In order to achieve this, the verifier would become the hub of expertise in his shop and provide knowledge and instruction to the less proficient mechanics. One point of interest was that the audit trail of this position was diluted because of reorganization, influx of new personnels into the shops, MIS-Q system down, training requirements overload and lack of a commonality in the use of the verifier.

### C. Production Control Support

During the STEP process, it was discovered that the number of production controllers was inadequate and the conversion of eleven mechanic positions was recommended. But based on the supervisor and production control interviews, the general perception was that this element was spread too thin. The spaces did not attract or retain individuals with the quality of experience required to be successful for those important duties and the "exodus" of personnel to other high paying - less responsibility fields increased rapidly. The survey also indicated that the production controller felt inadequate because he was tasked with an awesome responsibility, yet lacked the authority to execute it. They attributed this to the disparity in the grade structure, resulting in a master-servant attitude and thus promoting alienation of the two most important individuals that make the wheel turn.

As a result of all the data compiled, it was evident that there was a lack of understanding in the day to day functions that controlled cost. The state of euphoria that prevailed was reinforced by the perception that we were doing "swell". There was a lack of commitment in maintaining the discipline essential to foster integrity in a reporting system.

In pursuit of the objective to identify problem areas that contributed a significant reported manhour increase in the production of the UH-1H DEX A1 aircraft, we the task group, with the coordination and cooperation of the affected areas and their areas of support, arrived at the recommendations that are to follow, These recommendations have an implementation point of contact, the action elements, review validators and milestones that were coordinated with the implementation points of contact. As authorized by the Commander, the implementation point of contact will have the responsibility with commensurate authority to work and report on his/her assigned recommendation. The action elements will be the supporting areas that will be involved in the successful implementation of the recommendation and they will report to the implementation point of contact. The review/validators will be members of the Commander's Task Group. Their function will be to surveil the implementation process and offer help upon request in matters relative to the recommendation, intent and application.

In order to maintain fluid continuity of the implementation process, it was agreed upon by the Commander and all the implementation points of contact that monthly in-process review conferences be held with the implementation points of contact giving the progress reports. The Commander's Task Group members would be present also to serve in a consultant capacity. The date, time, place and attendees of the meeting would be coordinated by the STEP QIC faciliator.

A P P E N D I X B

BRIEFING SLIDES AND TEXT FOR CCAD'S  
MAY 84 IPR AT DESCOM

SOCIO-TECHNICAL EVALUATION PROGRAM

(STEP)

\* SOCIO TECHNICAL EVALUATION PROGRAM (STEP)

GOOD MORNING, SIR. THE PURPOSE OF THIS BRIEFING IS TO PROVIDE YOU WITH A FINAL REPORT ON THE STATUS OF THE IMPLEMENTATION OF THE APPROVED STEP RECOMMENDATIONS. THERE WAS ONLY ONE RECOMMENDATION WHICH REQUIRED HQDARCOM APPROVAL. THAT WAS THE MOVE OF THE FORECASTING FUNCTION FROM DIRECTORATE FOR MAINTENANCE TO DIRECTORATE FOR SUPPLY. I HAVE BROUGHT A LETTER WHICH REQUESTS DARCOM TO APPROVE THAT CHANGE PERMANENTLY.

AS I BEGIN THIS REPORT, I WANT TO ADDRESS MY EARLIER ESTIMATE ON PRODUCTIVITY SAVINGS THAT I MADE WHEN I BRIEFED YOU IN SEPTEMBER 82. AT THAT TIME, I ESTIMATED THE POTENTIAL SAVINGS IN UH-1 PRODUCTION TO BE 2% (OR SOME \$840,000). ALTHOUGH I FEEL THAT THIS ESTIMATED SAVINGS IS STILL ACHIEVABLE, I MUST TELL YOU THAT, SO FAR, WE HAVE NOT MADE IT. AS I GO THROUGH THIS PRESENTATION, I WILL GIVE YOU SOME SPECIFIC MEASURABLE PRODUCTION IMPROVEMENTS. OTHER IMPROVEMENTS--AND THERE HAVE BEEN MANY,--HAVE MOSTLY BEEN IN THE INTANGIBLE CATEGORY SO FAR. IN ALL FAIRNESS TO THE STEP PROCESS, I NEED TO TELL YOU THAT THERE HAS BEEN QUITE A BIT OF TURBULENCE AT CCAD DURING THE PERIOD WHEN STEP WAS BEING IMPLEMENTED. WE HAVE GAINED OVER 1,000 NEW EMPLOYEES

SOCIO TECHNICAL EVALUATION PROGRAM (STEP) (CONT)

(A 32% INCREASE), SET UP A NEW SPECIAL PROJECTS SECTION IN AIRFRAME SHOPS DIVISION, AND COMPLETED THE TRANSFER OF MOST OF THE NCAD DEPOT MAINTENANCE WORKLOAD.

CHANGES OF THIS MAGNITUDE IN ANY ORGANIZATION WITHOUT DETRIMENT WOULD BE DIFFICULT, BUT OCCURRING SIMULTANEOUSLY WITH STEP ORIGINATED CHANGES MAKE IT EXTREMELY DIFFICULT TO TRY TO SEPARATE OUT THE EFFECTS OF ANY OF THESE CHANGES INDIVIDUALLY. THIS IS ESSENTIALLY THE PREDICAMENT I FIND MYSELF IN NOW.

AS A RESULT, I WILL ADDRESS MY COMMENTS TO THE MAJOR STEP CHANGES WHICH ENSUED. WHERE THE RESULTS OF CHANGES CAN BE QUANTIFIED, I WILL PRESENT THOSE NUMBERS. WHERE THEY CAN NOT BE QUANTIFIED, I WILL PROVIDE THE INFORMATION AVAILABLE.

**RECOMMENDATIONS APPROVED BY**

**COMMANDER, CCAD**

- **ASSEMBLY LINE AIRCRAFT MOVEMENT AND CLEAN-UP**
- **MECHANIC CERTIFICATION/PERFORMANCE TESTING**
- **SUPERVISION/MANAGEMENT TRAINING AND OTHER IMPROVEMENTS**
- **REDUCTION OF DEAD-END JOBS**
- **MAINTENANCE VERIFIER POSITIONS**



RECOMMENDATIONS APPROVED BY COMMANDER, CCAD

THE RECOMMENDATIONS SHOWN ON THIS CHART ARE THE STEP INITIATIVES I APPROVED IN SEPTEMBER 1982.

JUST FOR YOUR INFORMATION, I WANT TO RATHER QUICKLY BRING YOU UP-TO-DATE ON THE STATUS OF EACH OF THESE ITEMS; WITH A LITTLE MORE IN-DEPTH REPORT ON THE LAST RECOMMENDATION - THE MAINTENANCE VERIFIER POSITIONS, BEFORE GETTING INTO THE ORGANIZATIONAL CHANGES, WHICH YOU APPROVED.

OUR FIVE ASSEMBLY LINE AIRCRAFT MOVERS AND CLEANERS ARE MOVING THE AIRCRAFT ONE HOUR PRIOR TO THE NORMAL TOUR OF DUTY. AS THE AIRCRAFT ARE BEING MOVED, THEIR PALLETS AND FUNCTIONAL TEST EQUIPMENT ARE MOVED ALSO. AS EACH STATION IS VACATED, IT IS CLEANED AND MADE READY FOR THE OTHER AIRCRAFT COMING INTO THAT STATION. WHEN THE MOVEMENT OF THE LINES IS COMPLETED, THE MOVERS ADDRESS THE CLEANLINESS OF THE REST OF THE ASSEMBLY LINE, PROPERLY DISPOSE OF PALLETS, AND MOVE TEST EQUIPMENT BACK TO THE CORRECT STATION. THE FIVE MANHOURS USED DAILY IN MOVING THE AIRCRAFT AND CLEANING THE STATIONS OFFSET AN AVERAGE OF TWENTY-FOUR MANHOURS UTILIZED BY EACH SHOP PREVIOUSLY, WHEN WE MOVED DURING THE NORMAL TOUR OF DUTY BY HIGHER GRADED

RECOMMENDATIONS APPROVED BY COMMANDER, CCAD (CONT)

MECHANICS. WHEN THE MOVER'S DUTIES ARE ACCOMPLISHED, THEY ARE EXPOSED TO THE AIRCRAFT, DOING REPETITIVE TYPE FUNCTIONS, AND ARE PROGRESSING VERY WELL. THEY ARE ALSO UNDERTAKING APPLICABLE CORRESPONDENCE COURSES AND ARE ENROLLED IN OUR BASIC HELPER TRAINING COURSE. THEY WANT TO PLACE THEMSELVES IN A PROMOTABLE STATUS AND WE ENCOURAGE THEM TO DO SO, IN TUNE WITH OUR PROGRAM TO ELIMINATE DEAD-END JOBS. OVERALL, WE ARE REALIZING A LOW COST TRAINING PROGRAM WITH THIS INITIATIVE IN ADDITION TO THE \$120,596 YEARLY SAVINGS ACHIEVED BY HAVING WH-02 LABORERS ACCOMPLISH THIS FUNCTION, RATHER THAN JOURNEYMAN MECHANICS.

THE MECHANIC CERTIFICATION PROGRAM, WHICH I ORIGINALLY APPROVED, HAS EVOLVED INTO A PERFORMANCE TESTING PROGRAM - SIMILAR TO WHAT IS ALREADY IN PLACE AT RED RIVER ARMY DEPOT. IN JANUARY 1984, WE AWARDED A CONTRACT FOR THE DEVELOPMENT OF PERFORMANCE AND ORAL INTERVIEW TESTS, FOR USE AS MEASUREMENT INSTRUMENTS IN THE EVALUATION OF CANDIDATES COMPETING FOR AIRCRAFT MECHANIC POSITIONS. THE CONTRACT WAS AWARDED TO DR. BETTY JEAN FULLER, A CONSULTANT FROM STANSBURY, UTAH. THE COST OF THE CONTRACT IS SLIGHTLY OVER \$9,000.00. THE COMPLETED "HANDS-ON" PERFORMANCE AND ORAL INTERVIEW PROCEDURE WILL BE USED TO EVALUATE CANDIDATES APPLYING FOR PROMOTION TO INTERMEDIATE

RECOMMENDATIONS APPROVED BY COMMANDER, CCAD (CONT)

AND JOURNEYMAN LEVEL AIRCRAFT MECHANIC POSITIONS IN EIGHT DIFFERENT AREAS OF THE DEPOT. THE FIRST STEP IN THE PROCESS, COLLECTION OF JOB ANALYSIS INFORMATION, HAS BEEN COMPLETED. ANALYSIS AND EVALUATION OF THIS DATA WILL SOON BE COMPLETED, BY A GROUP OF SUBJECT-MATTER EXPERTS. ESTIMATED COMPLETION DATE FOR THE ENTIRE PROJECT IS AUGUST 1984. THE PERFORMANCE TESTING CONCEPT HAS BEEN RECEIVED POSITIVELY BY OUR WORKFORCE. IT IS VIEWED AS A MUCH FAIRER AND MORE OBJECTIVE MEANS OF EVALUATING CANDIDATES FOR PROMOTION, THAN THE CURRENT USE OF THE SUPPLEMENTAL APPLICATION FORM. PLANS ARE TO EVENTUALLY INCORPORATE THIS CONCEPT IN THE CANDIDATE EVALUATION PROCESS FOR ALL WAGE GRADE POSITIONS.

WE HAVE DEVELOPED A DETAILED AND COMPREHENSIVE TRAINING PROGRAM FOR OUR SUPERVISORS AND MANAGERS. A COPY OF OUR NEW CATALOG, "PROGRAMS FOR SUPERVISORY AND MANAGEMENT DEVELOPMENT - 1984," WAS DISTRIBUTED TO SEVERAL DIFFERENT TRAINING INSTITUTIONS TO OBTAIN STUDENT COST PER COURSE, ON 10 MARCH 1984. FEEDBACK RECEIVED TO DATE INDICATES THAT THE TRAINING COST PER STUDENT RANGES FROM \$.60 PER STUDENT CLOCK

RECOMMENDATIONS APPROVED BY COMMANDER, CCAD (CONT)

HOUR AT ONE INSTITUTION, TO \$110.00 PER STUDENT DAY AT ANOTHER. FOUR CLASSES HAVE ALREADY BEEN SCHEDULED DURING THE MAY - JUNE TIME FRAME, AND A TOTAL OF 280 OF OUR SUPERVISORS WILL BE TRAINED IN THESE FOUR COURSES, AT A TOTAL COST OF LESS THAN \$1,000.00 - I HAVE BROUGHT ALONG COPIES OF THE CATALOG FOR YOU TO REVIEW AT YOUR LEISURE. OUR PRIMARY PURPOSE WAS TO TRAIN A MAXIMUM NUMBER OF OUR SUPERVISORS AND MANAGERS, IN COURSE SUBJECTS TAILORED TO OUR NEEDS, AT A MINIMUM COST. I THINK WE ARE WELL ON-THE-ROAD TO ACCOMPLISHING THAT OBJECTIVE.

THE "OTHER IMPROVEMENTS" PORTION OF THIS RECOMMENDATION ENDED UP COVERING TWO SEPARATE INITIATIVES. ONE OF THESE WAS THE ESTABLISHMENT OF SUPERVISORY UNDERSTUDY POSITIONS, TO BE USED FOR THE PURPOSE OF FILLING SUPERVISORY VACANCIES. AN UNDERSTUDY IS ONE WHO IS COMPETITIVELY SELECTED FOR THE PURPOSE OF BEING TRAINED TO ASSUME THE DUTIES OF A POSITION SCHEDULED TO BE VACATED IN A DEFINITE PERIOD OF TIME, USUALLY ONE YEAR OR LESS. NON-COMPETITIVE PROMOTION OF THE INCUMBENT TO THE TARGET POSITION MAY BE EFFECTED WHEN IT BECOMES VACANT, PROVIDED THE EMPLOYEE HAS DEMONSTRATED THE REQUIRED QUALIFICATION LEVELS. IF THE EMPLOYEE IS NOT PROMOTED, HE MUST BE REMOVED FROM THE UNDERSTUDY POSITION THROUGH ADVERSE ACTION PROCEDURES. EFFECTIVE 12 FEBRUARY 1984,

RECOMMENDATIONS APPROVED BY COMMANDER, CCAD (CONT)

OUR FIRST POSITION WAS FILLED ON AN UNDERSTUDY BASIS. THE POSITION BEING UNDERSTUDIED IS THAT OF SHEETMETAL MECHANIC (A/C), WS-10, THE INCUMBENT OF WHICH WILL RETIRE IN JULY 1984. MANAGEMENT HAS INDICATED THE UNDERSTUDY TEST IS PROVING TO BE VERY SUCCESSFUL. THE SELECTEE FOR THE WS-9 UNDERSTUDY POSITION IS UNDERGOING BOTH ON-THE-JOB AND CLASSROOM TRAINING TO PREPARE HIM FOR PROMOTION TO THE TARGET SUPERVISORY POSITION. THE BENEFITS EXPECTED FROM USE OF THE UNDERSTUDY CONCEPT ARE TWOFOLD: (1) UPON PROMOTION TO THE TARGET POSITION, WE WILL HAVE A FULLY TRAINED SUPERVISOR - READY TO ASSUME THE FULL-SCOPE SUPERVISORY DUTIES AND RESPONSIBILITIES, AND (2) WE WILL HAVE ELIMINATED SOME OF THE GROOMING, FAVORITISM AND PRE-SELECTION PERCEPTIONS CURRENTLY BEING EXPERIENCED WHEN FILLING SUPERVISORY POSITIONS.

THE LAST INITIATIVE UNDER THE SUPERVISION/MANAGEMENT RECOMMENDATION IS PUBLICATION OF A SERIES OF DF'S, OUTLINING GUIDANCE TO OUR SUPERVISORS IN MAKING THE CCAD PHILOSOPHY STATEMENT A WAY OF LIFE AT OUR DEPOT. WE HAVE PROVIDED YOU WITH A COPY OF THE NOTEBOOK CONTAINING THESE DF'S, PERSONALIZED WITH YOUR NAME.

RECOMMENDATIONS APPROVED BY COMMANDER, CCAD (CONT)

EACH OF OUR SUPERVISORS - FIRST-LINE THROUGH DIRECTOR - IS RECEIVING THEIR OWN PERSONALIZED COPY, WHICH IS GIVEN TO THEM DURING A MEETING WHERE I EXPLAIN THE REASON FOR WRITING THE DF'S, AND ANSWER ANY QUESTIONS THEY MAY HAVE.

CONCERNING THE RECOMMENDATION TO REDUCE DEAD-END JOBS, WE HAVE BEEN VERY SUCCESSFUL WITH OUR ACTIONS TO LATERALLY MOVE EMPLOYEES OCCUPYING DEAD-END POSITIONS, TO HELPER, WG-5 POSITIONS WITH PROMOTIONAL OPPORTUNITIES. DURING FY83 AND 84, 34 EMPLOYEES WERE REASSIGNED FROM DEAD-END POSITIONS TO HELPERS IN VARIOUS SPECIALTIES OF AIRCRAFT. THESE EMPLOYEES WILL BE GAINING EXPERIENCE TO ENABLE THEM TO BE COMPETITORS FOR THE INTERMEDIATE LEVELS OF THEIR SPECIALTY. WHILE WE HAVE NOT, IN FACT, TRULY ELIMINATED ANY DEAD-END POSITIONS, WE HAVE ENHANCED THE ADVANCEMENT OPPORTUNITIES OF THE EMPLOYEES OCCUPYING THOSE POSITIONS.

AT THIS TIME I WANT TO PROCEED TO THE NEXT SERIES OF CHARTS, TO GIVE YOU A MORE DETAILED ACCOUNT OF THE MAINTENANCE VERIFIERS.

## **QUALITY CONTROL PROBLEMS IDENTIFIED**

- **INDIVIDUALS/GROUPS NOT WORKING TOGETHER**
- **RESPONSIBILITY FOR QUALITY WORK**
- **MISINTERPRETATION OF STANDARDS**

•

QUALITY CONTROL PROBLEMS IDENTIFIED

THE STEP DESIGN GROUP IDENTIFIED MANY PROBLEMS IN THE AREA OF MISUNDERSTANDINGS BETWEEN QUALITY CONTROL INSPECTORS AND THE MECHANICS.

IT WAS FELT THAT INSPECTORS WOULD ONLY POINT OUT PROBLEMS, AND NOT ATTEMPT TO HELP RESOLVE THEM. YET, ON THE OTHER HAND, BOTH INSPECTORS AND MECHANICS FELT THAT THE BURDEN OF CONTROLLING QUALITY WAS THE INSPECTOR'S RESPONSIBILITY ALONE.

MAINTENANCE PERSONNEL ALSO FELT THAT THE INSPECTORS WERE AT TIMES INCONSISTENT IN STANDARDS OF ACCEPTANCE, WHICH RESULTED IN OVER-PROCESSING.

IT WAS RECOMMENDED THAT A MAINTENANCE VERIFIER, A NEW POSITION, BE PLACED IN CERTAIN DESIGNATED SHOPS, ON A TRIAL BASIS. THE ROLE OF THE MAINTENANCE VERIFIER WAS TO PLACE MAINTENANCE PERSONNEL IN-TUNE WITH QUALITY PERSONNEL TOWARD THE COMMON GOAL OF PRODUCING A QUALITY PRODUCT. WE RECEIVED YOUR CONCURRENCE IN ESTABLISHING THIS NEW POSITION AT OUR FIRST STEP IPR IN SEPTEMBER 1982.



# IMPLEMENTATION OF MAINTENANCE

## VERIFIER POSITION

- PROMOTE MAINTENANCE VERIFIERS TO DESIGNATED SHOPS
- TRAINING
- IMPACT ON SUPERVISION, O. C. INSPECTORS AND EMPLOYEES IN SHOPS
- POSITIVE RESULTS
- PROBLEMS

\* IMPLEMENTATION OF MAINTENANCE VERIFIER POSITION

THE STEP DESIGN GROUP, ALONG WITH MANY OTHER CCAD ELEMENTS, UNDERTOOK THE TASK OF ESTABLISHING THE NEW MAINTENANCE VERIFIER POSITION. THE JOB DESCRIPTIONS WERE WRITTEN, THE RECRUITING ACTIONS WERE ACCOMPLISHED, AND THE MAINTENANCE VERIFIERS WERE SELECTED FOR THEIR NEW JOBS IN JUNE 83.

THE VERIFIERS WERE THEN EXPOSED TO OVER ONE-HUNDRED AND TWENTY-EIGHT HOURS OF CLASSROOM TRAINING. THESE COURSES WERE DIRECTED AT IMPROVING TECHNICAL WRITING ABILITIES, LEARNING THE FINER POINTS OF BEING AN INSTRUCTOR, DEALING WITH OTHERS, AND DEVELOPING A WORKING KNOWLEDGE OF QUALITY CONTROL FUNCTIONS. ONE OF THE MANY OBJECTIVES OF THIS TRAINING WAS TO BUILD-UP A TEAM SPIRIT AMONG THE VERIFIERS. THIS WOULD OPEN UP THE LINES OF COMMUNICATION BETWEEN THE DIFFERENT SHOPS. THE MAINTENANCE VERIFIERS AGREE THAT THE TRAINING WAS WELL WORTH THE TIME, AND THEY HAVE USED SOME PORTION OF IT ON A DAILY BASIS.

TO IMPROVE OUR POSTURE IN THE AREA OF IN-HOUSE BOUNDARIES, THE MAINTENANCE VERIFIERS AND INSPECTORS NOW HOLD REGULAR MEETINGS TO DISCUSS PROBLEM AREAS, REPETITIVE DISCREPANCIES, NEW MISSIONS, AND PRODUCTION SCHEDULES. THE VERIFIERS COORDINATE MOVEMENT OF ASSEMBLIES IN THEIR AREAS OF RESPONSIBILITY. THEY ARE

IMPLEMENTATION OF MAINTENANCE VERIFIER POSITION (CONT)

ALSO TRAINING THE NEW EMPLOYEES, AND THE LESS PROFICIENT EMPLOYEES, THROUGH ON-THE-JOB, HANDS-ON, TYPE TRAINING. THE TRAINING CONSISTS OF SPECIAL EQUIPMENT USAGE, HAND TOOLS, TECHNICAL MANUALS USE, AND GENERAL AVIATION MAINTENANCE PRACTICES. THE MAINTENANCE VERIFIER SUPPORTS THE SUPERVISOR IN MAINTAINING POSITIVE ATTITUDES AMONG THE EMPLOYEES IN HIS OWN SHOP AND IN OTHER RELATED SHOPS. OVERALL, THE NEGATIVE FEELINGS, AND MISUNDERSTANDINGS, BETWEEN MECHANICS AND INSPECTORS HAVE IMPROVED. HOWEVER, MANY ACTIONS TAKEN OVER THE PAST YEAR, UNRELATED TO STEP, MAKE IT DIFFICULT TO JUDGE THE EFFECTIVENESS OF THE MAINTENANCE VERIFIER, AS RELATED TO PRODUCTION IMPROVEMENTS AND COST SAVINGS.

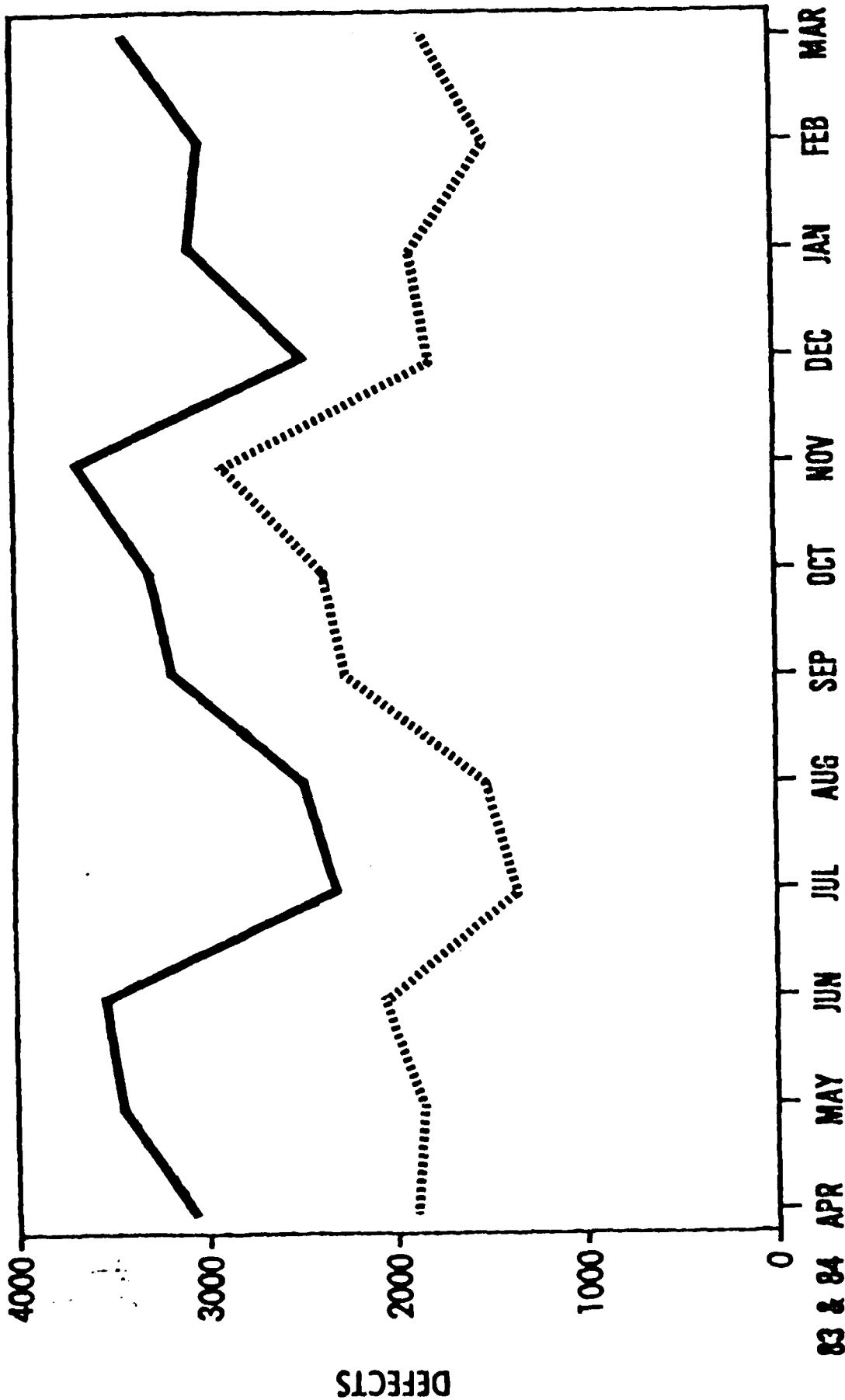
THERE HAVE BEEN MANY POSITIVE RESULTS WHICH ARE DIFFICULT, IF NOT IMPOSSIBLE, TO QUANTIFY: THE ONE-ON-ONE TRAINING FOR NEW EMPLOYEES AND NEWLY PROMOTED EMPLOYEES; THE PRESENCE OF A HIGHLY SKILLED INDIVIDUAL WITH THE RESPONSIBILITY TO LEAD, AND WORK WITH, LESS PROFICIENT CREW CHIEFS AND CREW MEMBERS; THE ESTABLISHMENT OF A LINE OF COMMUNICATION BETWEEN SHOPS; A SUPPORT ROLE FOR THE SUPERVISOR IN MAINTAINING POSITIVE ATTITUDES: A RESPONSIBLE INDIVIDUAL TO ASSIST

IMPLEMENTATION OF MAINTENANCE VERIFIER POSITION (CONT)

THE SUPERVISOR IN COORDINATION EFFORTS TO MEET PRODUCTION SCHEDULES; AND A GOOD SOURCE OF INFORMATION TO THE MECHANICS ON WORK PROCEDURES, TECHNICAL MANUAL ASSISTANCE, AND FEEDBACK ON PROBLEM AREAS.

THERE HAVE ALSO BEEN SOME PROBLEM AREAS ASSOCIATED WITH OUR IMPLEMENTATION EFFORTS: AS YOU KNOW, CCAD HAS STARTED SEVERAL NEW SPECIAL PROJECTS, WHICH SHIFTED AROUND MANY OF OUR EMPLOYEES, AND CREATED A LOT OF TEMPORARY TURMOIL; WE HAVE IMPLEMENTED THE ALPS AND SHOP FLOOR SYSTEM PROGRAMS DURING THIS SAME TIME PERIOD; WE HAVE FOUND THAT MANY DIFFERENCE PERCEPTIONS EXIST AS TO WHAT THE VERIFIER'S DUTIES ARE, AND HIS ROLE IN RELATION TO OTHERS; AND THERE HAS BEEN A LARGE INFLUX OF NEW PERSONNEL, AND NEWLY PROMOTED PERSONNEL.

# UH1 DEFECTS VS AIRFRAME DEFECTS



Month	AF DEFECTS	UH1 DEFECTS
APR	3069	1917
MAY	3466	1879
JUN	3542	2086
JUL	2333	1382
AUG	2507	1541
SEP	3199	2270
OCT	3328	2392
NOV	3703	2932
DEC	2497	1821
JAN	3088	1929
FEB	3029	1522
MAR	3430	1841

## UH-1 DEFECTS VS AIRFRAME DEFECTS

THIS CHART INDICATES THE NUMBER OF DEFECTS RECORDED IN THE AIRFRAME DIVISION - THE YELLOW LINE, AND THOSE RECORDED ON THE UH-1 AIRCRAFT - THE RED LINE. SINCE THE UH-1 MAKES UP THE BULK OF OUR AIRFRAME WORKLOAD, IT IS NOT SURPRISING THAT THE LINES ARE VIRTUALLY PARALLEL.

YOU WILL NOTICE A DOWNWARD TREND IN DEFECTS DURING JULY AND AUGUST. THIS WAS WHEN THE MAINTENANCE VERIFIER WENT INTO ACTION IN THE SHOPS. THE OUTSIDE INFLUENCES AND TURMOIL, HOWEVER, PREVENTED A TRUE EVALUATION OF WHETHER OR NOT THE MAINTENANCE VERIFIER WAS RESPONSIBLE FOR THE DROP IN DEFECTS.

YOU WILL ALSO NOTICE, IN JANUARY, ANOTHER SIGNIFICANT DROP IN DEFECTS ON THE UH-1, WHILE THE DEFECTS IN THE DIVISION AS A WHOLE HAVE BEEN ON THE RISE SINCE THE FIRST OF THIS YEAR. IN JANUARY, I CALLED THE MAINTENANCE VERIFIERS AND QC INSPECTORS TOGETHER TO DISCUSS ROLES, RELATIONSHIPS AND PROBLEMS. SINCE MAINTENANCE VERIFIERS ARE ONLY IN THOSE SHOPS WITH UH-1 WORKLOAD, I CONSIDER THIS DROP IN DEFECTS TO BE A POSITIVE RESULT OF THAT MEETING.

UH-1 DEFECTS VS AIRFRAME DEFECTS (CONT)

ONE OTHER SIGNIFICANT ITEM ON THIS CHART IS THE RISE IN DEFECTS ON THE UH-1 DURING THE SEPTEMBER TO NOVEMBER TIME FRAME - THE TIME WHEN WE STARTED SPECIAL PROJECTS, AND MOVED 116 NEW PEOPLE INTO THAT AREA.

DURING THE LAST YEAR, THE REWORK MANHOURS IN THE AIRFRAME DIVISION HAVE REMAINED RELATIVELY CONSTANT. WITH THE MASS MIGRATION OF THE WORKFORCE, THE INFUX OF NEW PERSONNEL AND UTTER TURMOIL WITHIN THE DEPOT, AN APPRECIABLE RISE IN REWORK MANHOURS SHOULD BE EXPECTED. THE FACT THAT REWORK MANHOURS DID NOT RISE IS, I FEEL, A POSITIVE RESULT, ATTRIBUTABLE TO THE EFFORTS OF THE MAINTENANCE VERIFIER.

# **STEP DESIGN GROUP REACTIVATED**

- **WORKFORCE INTERVIEWED**
- **RESULTING RECOMMENDATIONS**



STEP DESIGN GROUP REACTIVATED

THE STEP DESIGN GROUP WAS REACTIVATED IN FEBRUARY 84 AS PART OF A COMMANDER'S TASK FORCE TO IDENTIFY PROBLEM AREAS THAT CONTRIBUTED TO A SIGNIFICANT REPORTED MANHOUR INCREASE IN PRODUCING UH-1 AIRCRAFT. THIS TASK FORCE CONDUCTED SURVEY INTERVIEWS WITH SUPERVISORS, INSPECTORS, AND OTHER EMPLOYEES THROUGHOUT THE AIRFRAME SHOPS DIVISION. THESE INTERVIEWS REVEALED THAT, AS A WHOLE, THE MAINTENANCE VERIFIER WAS THOUGHT TO BE AN ASSET TO PRODUCTION. SOME WORK CENTERS WERE EXPERIENCING DIFFICULTIES, WHILE OTHERS FELT THE VERIFIER WAS RIGHT ON TARGET WITH THE PROGRAM. THE SURVEY ALSO INDICATED THAT SOME VERIFIERS FELT INADEQUATE IN SOME AREAS DUE TO A LACK OF AUTHORITY TO EXECUTE THEIR PERCEPTIONS OF THEIR ROLES.

TO ELIMINATE THESE PROBLEMS, THE GROUP RECOMMENDED THE FOLLOWING: (1) REDEFINE DUTIES OF THE MAINTENANCE VERIFIER (THROUGH RULE IDENTIFICATION TRAINING), TO THE SUPERVISORS, INSPECTORS, PRODUCTION CONTROLLERS, AND ALL OTHER CONCERNED EMPLOYEES; (2) ESTABLISH A PROFESSIONAL ASSOCIATION QUALITY CIRCLE, THE MEMBERS CONSISTING OF MAINTENANCE VERIFIERS AND INSPECTORS; (3) TEAM-BUILDING TRAINING (TO BE ADMINISTERED BY OUR OE OFFICER) FOR ALL LEVELS OF CONCERNED EMPLOYEES; AND (4) A TRAINING PROGRAM FOR MECHANICS, INVOLVING HANDS-ON EXPERIENCE WITH A MOCK-UP UNIT, PLUS CLASSROOM TRAINING.

# **MAINTENANCE VERIFIER SUMMARY**

- **QC AND MAINTENANCE TOGETHER**
- **EVERYONE HAS QUALITY RESPONSIBILITY**

• MAINTENANCE VERIFIER SUMMARY

ONCE ALL OF OUR MILESTONES FOR THESE NEW RECOMMENDATIONS ARE COMPLETED, THE MAINTENANCE VERIFIER WILL BE A MUCH MORE EFFECTIVE TOOL FOR MANAGEMENT. WITH BOTH QUALITY CONTROL PERSONNEL AND THE MAINTENANCE VERIFIERS HEADING IN THE SAME DIRECTION, THE APPLICATION OF A HIGH LEVEL OF QUALITY CONTROL WILL MINIMIZE WASTE OF TIME, LABOR, AND MATERIAL. AS A RESULT OF OUR EFFORTS TOWARD ESTABLISHING THE MAINTENANCE VERIFIER POSITIONS ALONG THE LINES ORIGINALLY INTENDED BY THE STEP DESIGN GROUP, THE GENERAL THEME AT CCAD IS THAT QUALITY IS NO LONGER LIMITED TO THE INSPECTOR - EVERYONE AT CCAD HAS RESPONSIBILITY FOR QUALITY OF PRODUCTION AND PRODUCT.

# PRODUCTION PLANNING AND CONTROL

## WEAKNESSES IDENTIFIED

- UNDERSTAFFED AND INEFFECTIVE
- UNEVEN WORKFLOW
- EMPLOYEE FRUSTRATIONS

•  
PRODUCTION PLANNING AND CONTROL  
WEAKNESSES IDENTIFIED

REGARDING THE PRODUCTION CONTROL ORGANIZATIONAL CHANGES - THE STEP PROCESS IDENTIFIED PARTS AVAILABILITY AS A KEY VARIANCE INVOLVED IN AIRFRAME OVERHAUL. THE PRODUCTION CONTROL FUNCTION WAS IDENTIFIED TO BE UNDERSTAFFED AND INEFFECTIVE.

THESE WEAKNESSES CRIPPLED THE EFFORT TO PROVIDE PARTS TO MECHANICS IN A TIMELY MANNER, RESULTED IN AN UNEVEN WORKFLOW, AND LED TO MECHANICS AND SUPERVISORS CHASING PARTS; WHICH CAUSED FRUSTRATION AND INEFFECTIVENESS SINCE THEY WERE NOT TRAINED FOR THIS TYPE OF WORK.

IT WAS FELT THAT BETTER INTEGRATION OF THE PRODUCTION CONTROL FUNCTION - AT THE SHOP LEVEL, IN SCHEDULING THE WORKLOAD - WOULD ALLEVIATE MANY OF THE PARTS PROBLEMS. FOR THESE REASONS IT WAS RECOMMENDED THAT THE AIRFRAME PRODUCTION CONTROL FUNCTION BE MOVED TO PP&C DIVISION. AS YOU RECALL, YOU APPROVED THIS RECOMMENDATION DURING OUR FIRST HQDESCOM STEP IPR IN SEPTEMBER 82.

# **IMPLEMENTATION OF PPC RECOMMENDATIONS**

- **PRODUCTION SPECIALIST IN EACH SHOP**
- **TRAINING**
- **SHOP SUPERVISORS/QUALITY INVOLVED IN PLANNING**
- **IMPACT ON PPC SUPERVISION**

## IMPLEMENTATION OF PPC RECOMMENDATIONS

IMPLEMENTATION OF THESE RECOMMENDATIONS BEGAN IMMEDIATELY AFTER YOUR APPROVAL, BY CREATING A PRODUCTION SPECIALIST IN EACH SHOP - RESPONSIBLE FOR PLANNING, SEQUENCING, REQUISITIONING, AND SCHEDULING PARTS, HARDWARE, AND MATERIALS REQUIRED BY THE SHOPS. ALTHOUGH WE ANTICIPATED A SMOOTH TRANSITION, WE EXPERIENCED PROBLEMS IN RECRUITING THE QUALITY OF EXPERTISE NECESSARY TO PERFORM THESE IMPORTANT FUNCTIONS. A GS-8 PRODUCTION CONTROL POSITION WAS CREATED IN AN EFFORT TO ATTRACT ADDITIONAL PERSONNEL IN SUPPORT OF SHOP WORKLOADING AND SCHEDULING REQUIREMENTS, BUT WE STILL HAVE VACANCIES FOR THIS POSITION DUE TO THE LACK OF SUFFICIENT QUALIFIED CANDIDATES.

THREE WEEKS OF INTENSIVE PPC TRAINING WAS CONDUCTED BY A TEAM CONSISTING OF PERSONNEL FROM THE DIRECTORATE FOR SUPPLY AND THE DIRECTORATE FOR MAINTENANCE. THIS TRAINING WAS COMPLETED IN AUGUST 83. THE INTERFACE OF THESE TWO DIRECTORATES STRENGTHENED THE COMMUNICATION LINK IN PROVIDING BETTER PARTS REQUISITIONING PRACTICES AND PROCEDURES. PRODUCTION CONTROLLERS IN ALL THREE COMMODITY AREAS WERE GIVEN THE TRAINING AND 85% OF THOSE PERSONNEL INTERVIEWED SAID THE TRAINING WAS EXCELLENT. THE RESPONSE FROM BOTH EMPLOYEES AND MANAGEMENT HAS BEEN THAT THE TRAINING WAS THE MOST POSITIVE STEP EVER TOWARD EDUCATING PPC PERSONNEL TO

IMPLEMENTATION OF PPC RECOMMENDATIONS (CONT)

DO THEIR JOB CORRECTLY AND WORK TOGETHER MORE EFFECTIVELY.

SINCE IMPLEMENTATION OF THE STEP RECOMMENDATIONS, THE PRODUCTION CONTROL FUNCTION HAS GREATLY REDUCED THE NEED FOR MECHANICS AND SUPERVISORS TO CHASE DOWN AND FOLLOW-UP ON PARTS, MATERIALS, AND HARDWARE. BOTH FIRST-LINE SUPERVISORS, AND QUALITY PERSONNEL, ARE BROUGHT INTO PLANNING AT AN EARLIER STAGE. THEY ATTEND PRODUCTION CONTROL MEETINGS, DISCUSS RECURRING DEFECTS, AND MAKE RECOMMENDATIONS TO IMPROVE PRODUCTION.

ADDITIONALLY, PPC SUPERVISORY PERSONNEL WERE MOVED AROUND WITHIN THE DIVISION TO FULLY UTILIZE THEIR BACKGROUNDS, SKILLS, AND ABILITIES. THIS IMPROVED USE OF THEIR EXPERTISE ASSURES GREATER DEPTH IN ASSISTING THEIR SUBORDINATES WITH PRODUCTION PROBLEMS, AND PROVIDES BETTER INTEGRATION WITH SHOP SUPERVISORS. WE HAVE ALSO PROGRESSIVELY REDUCED THE TIME FRAME FOR MATERIAL REQUISITIONING - THAT IS, FROM THE TIME A SHORTAGE IS IDENTIFIED TO THE TIME IT IS ORDERED, IN TURN DECREASING THE OVERALL NUMBER OF HIGH PRIORITY REQUESTS.



## **STEP DESIGN GROUP REACTIVATED**

- **COMMANDER'S TASK GROUP ORGANIZED**
- **SUPERVISOR/PRODUCTION CONTROLLER INTERVIEWED**
- **DIFFICULTIES IN WORKLOADING**
- **EXODUS OF PPC PERSONNEL**
- **DISPARITY IN GRADE STRUCTURE**
- **RECOMMENDATIONS**

\* STEP DESIGN GROUP REACTIVATED

AS PREVIOUSLY STATED, THE SDG WAS REACTIVATED IN FEBRUARY TO IDENTIFY CAUSES OF INCREASED UH-1 PRODUCTION MANHOURS. AN ADDITIONAL STATED TASK FOR THE SDG WAS TO TAKE ANOTHER LOOK AT HOW EFFECTIVELY AND COMPLETELY WE HAD IMPLEMENTED THE STEP RECOMMENDATIONS.

THE GROUP BEGAN WITH THE SURVEY INTERVIEW OF FIRST-LINE SUPERVISORS, WHICH INCLUDED QUESTIONS CONCERNING PRODUCTION CONTROL SUPPORT; THE GENERAL PERCEPTION WAS THAT THIS ELEMENT WAS SPREAD TOO THIN. A SURVEY INTERVIEW OF PRODUCTION CONTROLLERS THROUGHOUT THE AIRFRAME DIVISION FOUND THAT APPROXIMATELY 50% OF THE SHOPS HAD A GOOD SUPERVISOR-TO-PRODUCTION CONTROLLER RELATIONSHIP, AND IMPLEMENTATION WAS IN-PROCESS, AS THE SDG HAD ENVISIONED IT.

THE OTHER HALF, MEANWHILE, WAS EXPERIENCING DIFFICULTIES IN WORKLOADING, SCHEDULING, AND UTILIZING OVERTIME PROPERLY. SOME PRODUCTION CONTROLLERS SAID THEY HAD LITTLE "SAY SO" IN HOW THE SHOPS WERE RUN.

STEP DESIGN GROUP REACTIVATED (CONT)

THE SURVEY ALSO SURFACED THE FACT THAT, DUE TO THE GRADES OF THE POSITIONS, PRODUCTION CONTROL VACANCIES WERE NOT ATTRACTING, OR RETAINING, INDIVIDUALS FOR THESE IMPORTANT DUTIES, AND AN "EXODUS" OF PERSONNEL TO OTHER HIGHER PAYING, LESS RESPONSIBILITY FIELDS WAS INCREASING RAPIDLY.

MOST PRODUCTION CONTROLLERS SAID THEY FELT INADEQUATE BECAUSE THEY WERE TASKED WITH AN AWESOME RESPONSIBILITY, YET LACKED THE AUTHORITY TO EXECUTE IT. THEY ATTRIBUTED THIS TO A DISPARITY IN THE GRADE STRUCTURE, RESULTING IN A MASTER-SERVANT ATTITUDE, AND THUS PROMOTING ALIENATION OF THE TWO MOST IMPORTANT INDIVIDUALS THAT MAKE THE WHEEL TURN - THE PRODUCTION CONTROLLER AND THE FIRST-LINE SUPERVISOR.

RECOMMENDATIONS TO ALLEVIATE THESE PROBLEMS INCLUDED A SHORT RANGE PLAN TO (1) DEVELOP A CONTINUING TRAINING SCHEDULE FOR NEW PRODUCTION CONTROLLERS AND PARTS EXPEDITERS AT THE TIME THAT THEY ASSUME THEIR POSITIONS; AND (2) DEVELOP A REFRESHER COURSE TO REINFORCE WEAK AREAS OF INDIVIDUALS IN KEY POSITIONS. AS A LONG RANGE PLAN, THE RECOMMENDATIONS WERE TO, (1) REVIEW ALL GS-1152-8 POSITIONS AND PROVIDE A BETTER LINE OF PROGRESSION, AND (2) ESTABLISH, RECRUIT AND FILL PRODUCTION CONTROL LEADER POSITIONS, WHERE JUSTIFIABLE.

## **PPC SUMMARY**

- RECENT TURNAROUND
- TURN-IN OF EXCESS MATERIAL
- IMPROVED COMMUNICATIONS
- BETTER VISIBILITY OF SCHEDULE
- BETTER PERSONNEL UTILIZATION

PPC SUMMARY

ALTHOUGH SOME PHASES OF IMPLEMENTATION HAD NOT BEEN CARRIED OUT AS THE SDG HAD PLANNED, MORE SHOPS ARE ON THE RIGHT TRACK NOW. MORE EMPHASIS IS BEING PLACED ON SUPPORT SHOPS' OUTPUT BEING SCHEDULED ON A DAILY BASIS, AND OVERTIME IS NOW BEING REQUESTED AND REGULATED BY SHOP PRODUCTION CONTROLLERS. OVERTIME IS CONFINED ONLY TO THOSE AIRCRAFT AND PROJECTS WHERE IT IS JUSTIFIABLE, AND THEN ONLY IN TERMS OF THE NUMBER OF MANHOURS NECESSARY TO COMPLETE THE WORKLOAD. PRIORITIES ARE BEING IDENTIFIED TO SHOP SUPERVISORS, AND THIS ENSURES THAT THE PROPER ITEMS ARE WORKED.

AS A RESULT OF THE CHANGES IN PPC MODES OF DAILY OPERATION, ALMOST \$700,000.00 IN EXCESS MATERIAL HAS BEEN TURNED IN TO SUPPLY, AND THIS EFFORT IS ON-GOING.

WE HAVE CREATED A UNIFIED EFFORT IN COMMUNICATIONS, AND THIS EXCHANGE OF INFORMATION FROM SUPPORT SHOPS IN AIRFRAME, ENGINE, AND COMPONENT DIVISIONS, HAS CONTRIBUTED TO BETTER PARTS SUPPORT BEING PROVIDED TO THE ASSEMBLY LINE.

WE ALSO HAVE A BETTER VISIBILITY FOR OUR AIRCRAFT SCHEDULE THAN WE HAVE HAD PREVIOUSLY. THIS INSIGHT ENABLES US TO RESPOND MORE QUICKLY, BY IDENTIFYING PROBLEM AIRCRAFT AND TAKING ACTION BEFORE THEY REACH THE

PPC SUMMARY (CONT)

CRITICAL STAGE.

FINALLY, SINCE THE ENTIRE PRODUCTION CONTROL FUNCTION IS NOW UNDER ONE UMBRELLA, WE CAN MOVE PEOPLE AROUND BETTER, UTILIZING THEIR SKILLS AND ABILITIES TO THE GREATEST POTENTIAL.

**ORGANIZATIONAL MOVE OF THE  
AUTOMATED STORAGE AND  
RETRIEVAL SYSTEM (ASTORS) FUNCTION  
TO PRODUCTION PLANNING AND CONTROL DIVISION**

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ORGANIZATIONAL MOVE OF THE  
AUTOMATED STORAGE AND RETRIEVAL SYSTEM (ASTORS) FUNCTION  
TO PRODUCTION PLANNING AND CONTROL DIVISION

DURING THE STEP PROCESS, THE STEP DESIGN GROUP ALSO DISCOVERED THAT ASSEMBLY LINE SUPERVISORS AND MECHANICS WERE FRUSTRATED DUE TO DEALING WITH INCOMPLETE KITS. EMPLOYEES WHO ASSEMBLED THE KITS WERE NOT FAMILIAR WITH THE GENERAL APPEARANCE, FUNCTION, OR CONDITION OF PARTS FOR SPECIFIC AIRCRAFT. NO ONE GROUP WAS TOTALLY RESPONSIBLE FOR KITTING IN SUPPORT OF THE LINE.

THE CONSENSUS WAS THAT THE RESPONSIBILITY FOR KITTING COMPLETENESS AND TIMELY DELIVERY SHOULD BE ASSIGNED TO ASTORS. THE SDG RECOMMENDED THAT THE ASTORS FUNCTION, THEN IN AIRFRAME SHOPS DIVISION, BE MOVED TO THE PRODUCTION PLANNING AND CONTROL DIVISION.

YOU ALSO APPROVED THIS RECOMMENDATION AT OUR SEPTEMBER 82 STEP IPR. IMPLEMENTATION WAS COMPLETED IN AUGUST 1983, WITH THE COMPLETION OF THE TRAINING OF MATERIEL EXPEDITERS AND PRODUCTION CONTROLLERS.



## CURRENT STATUS OF ASTORS FUNCTION

- ASSEMBLY OF OVERHAUL KITS INCREASING
- IMPROVED COMMUNICATION
- IMPROVED HARDWARE KITTING
- PALLET FILL RATE STABILIZING
- DOLLAR SAVINGS
- FUTURE OF ASTORS

\* CURRENT STATUS OF ASTORS FUNCTION

THE REQUIREMENT FOR THE ASSEMBLY OF OVERHAUL KITS CONTINUES TO INCREASE. THE MAINTENANCE SHOP FLOOR SYSTEM IS REPLACING THE CUMBERSOME CARD SYSTEM OF IDENTIFYING PARTS SHORTAGES, WITH COMPUTER GENERATED LISTINGS THAT WILL BE CLEARED IN ASTORS AS INVENTORY GAIN.

CONCENTRATED EFFORTS TO IMPROVE COMMUNICATIONS BETWEEN ASTORS AND THE SHOPS CONTINUE, AND HAVE RESULTED IN THE REVIEWING AND REVISING OF KITS. HOSES, TUBES, DUCTS, AND PARTS THAT NEED NOT BE RETURNED TO THE SAME AIRCRAFT, NOR KITTED, ARE MANAGED BY THE RESPECTIVE LINE SUPPORT ELEMENT.

ASTORS IS ALSO RESPONSIBLE FOR THE KITTING OF HARDWARE. MECHANICS, THEREFORE, WASTE LESS TIME CHASING DOWN AND FOLLOWING UP ON NUTS, BOLTS, RIVETS, ETC.

OUR PALLET FILL SITUATION IS STABILIZING - THROUGH MARCH, WE HAD AN AVERAGE FILL BETWEEN 80 AND 90% FROM STATION 7 THRU STATION 14.

CURRENT STATUS OF ASTORS FUNCTION (CONT)

SINCE MARCH, THE PALLET FILL RATE HAS DECREASED AS WE HAVE PHASED IN THE WORK STATION REQUIREMENTS MODULE OF THE SHOP FLOOR SYSTEM. START-UP PROBLEMS WITH THAT MODULE CAUSED AN INITIAL REDUCTION OF PALLET FILL, WHICH IS NOW BEING RESOLVED. FULL IMPLEMENTATION OF THE SYSTEM SHOULD ENABLE HIGH PALLET FILL RATES WITHOUT THE INTENSIVE LABOR FORMERLY REQUIRED.

APPRECIABLE DOLLAR SAVINGS IN ASTORS ARE PART OF THE IDENTIFIABLE EXCESS - \$700,000.00 - DISCUSSED IN THE PRODUCTION CONTROL PORTION OF THIS BRIEFING.

FINALLY, ASTORS AS WE KNOW IT TODAY, WILL CEASE TO EXIST BY THE END OF 1985. AT THAT TIME, THE PEOPLE IN ASTORS WILL BECOME A PART OF THE NEW ASRS, WHICH WILL INTERFACE WITH THE MAINTENANCE SHOP FLOOR SYSTEM, BUT THEY WILL REMAIN AN ORGANIZATIONAL SEGMENT OF PP&C DIVISION.

**ORGANIZATIONAL MOVE OF THE PRE-SHOP  
ANALYSIS (PSA) FUNCTION  
TO THE DIRECTORATE FOR QUALITY ASSURANCE**

\* ORGANIZATIONAL MOVE OF THE PRE-SHOP ANALYSIS (PSA) FUNCTION  
TO THE DIRECTORATE FOR QUALITY ASSURANCE

IT WAS A STEP RECOMMENDATION TO MOVE THE AIRFRAME PRE-SHOP ANALYSIS BRANCH FROM  
THE DIRECTORATE OF MAINTENANCE TO THE DIRECTORATE FOR QUALITY ASSURANCE.

THE PURPOSE OF THIS ORGANIZATIONAL CHANGE WAS TO FACILITATE STANDARDIZATION OF  
WORK REQUIREMENTS BETWEEN QC INSPECTORS AND PSA EXAMINERS. IN ADDITION, THE  
INCREASED INTERFACING OF THOSE TWO BRANCHES WOULD STRENGTHEN COMMUNICATIONS  
BETWEEN THE TWO. THIS MOVE WAS APPROVED BY YOU AT OUR SEPTEMBER 82 STEP IPR.  
THE MOVE WAS IMPLEMENTED ON 16 JANUARY 83. AN AVSCOM QUALITY EVALUATION  
RECOMMENDATION RESULTED IN ENGINES PSA ALSO MOVING TO QUALITY ASSURANCE IN  
AUGUST 83.

**IMPLEMENTATION OF THE**  
**PSA ORGANIZATIONAL CHANGE**

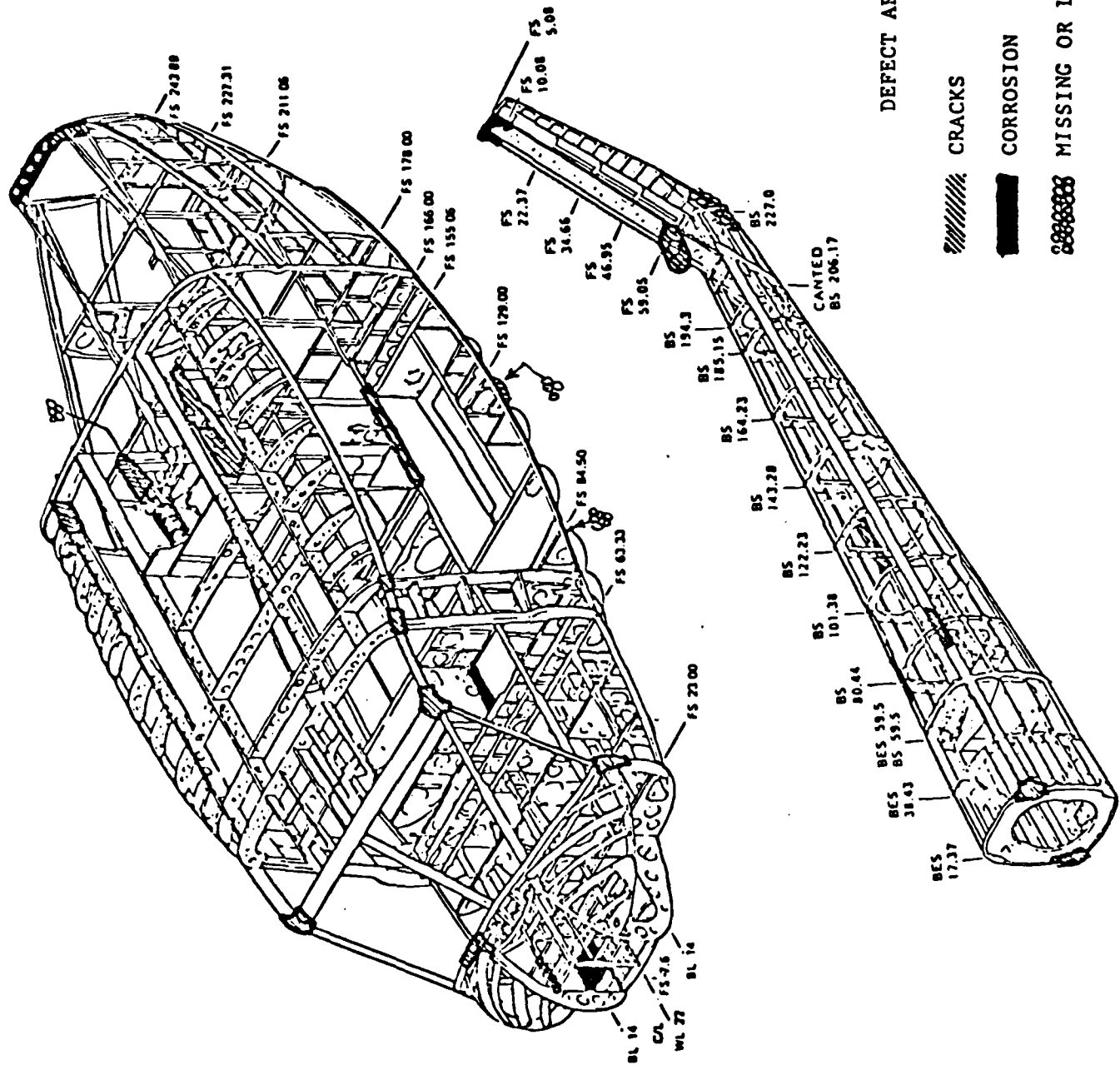
- ALL MILESTONES ACCOMPLISHED
- COMMUNICATIONS IMPROVED
- CROSS-UTILIZATION OF PERSONNEL

\* IMPLEMENTATION OF THE PSA ORGANIZATIONAL CHANGE

THIS ORGANIZATIONAL CHANGE WAS A VERY SMOOTH ACTION. ALL MILESTONES HAVE BEEN ACCOMPLISHED WITH NO PROBLEMS. MOST OF THE COMMENTS EXPRESSED HAVE BEEN POSITIVE. PSA SUPERVISORS ATTEND WEEKLY MAINTENANCE QUALITY CONTROL MEETINGS, WHERE OPEN DISCUSSIONS PERTAIN TO PRODUCTION AND QUALITY PROBLEMS, PROGRESS, AND SCHEDULES.

BOTH QC AND PSA SUPERVISORS REPORT TO THE SAME DIVISION CHIEF. BETTER COMMUNICATIONS BETWEEN PSA EXAMINERS, QC INSPECTORS, AND MAINTENANCE PERSONNEL EXIST NOW. MANY PSA EXAMINERS WERE RECRUITED FROM THE QC WORKFORCE, THEREFORE, INTERPRETATION OF STANDARDS IS NO PROBLEM.

BECAUSE BOTH ELEMENTS ARE UNDER ONE ROOF, INSPECTORS WILL BE DETAILED TO PSA AS NECESSARY TO ELIMINATE OVERTIME USAGE AND FILL VACANCY GAPS.





DEFECT PLOTTING CHART

AS AN EXAMPLE OF ONE OF THE TRULY POSITIVE OUTCOMES OF THE PSA ORGANIZATIONAL CHANGE, I HAVE BROUGHT ALONG THIS DEFECT PLOTTING CHART - A NEW INNOVATION SINCE PSA MOVED TO QUALITY ASSURANCE.

DEFECTS WRITTEN BY THE QC INSPECTORS AFTER PSA EVALUATION, AND SUBSEQUENT STRUCTURAL REPAIRS, ARE REFERRED TO AS "PSA OVERSIGHTS." WE HAVE NOW IMPLEMENTED THIS RECORDING SYSTEM, WHICH ALLOWS FOR FEEDBACK INFORMATION TO THE PSA EXAMINER, AND THE SHOP.

THE DEFECTS ARE RECORDED IN THE AIRFRAME STRUCTURES, AND TAILBOOM STRUCTURE, SHOPS. THEY ARE THEN PLOTTED ON THIS UH-1 STRUCTURE DIAGRAM. THE THREE MOST REPETITIVE TYPES OF DEFECTS NOTED ARE CRACKS, CORROSION, AND IMPROPERLY INSTALLED OR MISSING PARTS.

THESE PLOTTED CHARTS ARE USED DURING JOINT MEETINGS BETWEEN PSA EXAMINERS AND INSPECTORS. THE MEETINGS HAVE THESE OBJECTIVES: (1) TO INSURE ADEQUATE PSA EVALUATIONS; (2) TO UNCOVER DMMR AND TECHNICAL DATA PROBLEMS; AND (3) TO DETERMINE IF WE ARE GOLDPLATING, OR OVER-PROCESSING, A PRODUCT.

DEFECT PLOTTING CHART (CONT)

THIS DEFECT PLOTTING CHART HAS BECOME A VERY EFFECTIVE TOOL IN ENSURING MAXIMUM PRODUCTION EFFECTIVENESS THROUGH GOOD QUALITY CONTROL MANAGEMENT. SINCE INSTITUTING THIS CHART, WE HAVE NOTED A 37% DECREASE IN DEFECTS, RESULTING IN A REDUCTION OF REWORK MANHOURS. IT IS DOUBTFUL THAT PSA AND QUALITY CONTROL PERSONNEL COULD HAVE COOPERATED FULLY IN THIS TYPE OF EFFORT WHILE OPERATING UNDER SEPARATE ORGANIZATIONAL ENTITIES.

THIS MEANS OF PLOTTING DEFECTS IS CURRENTLY BEING EXPANDED TO INCLUDE THE OH-58 AND THE AH-1 COBRA DEFECTS. WE EXPECT TO HAVE THOSE PROCESSES IN-PLACE BY 1 JUNE, ALSO, THESE CHARTS WILL BE USED AS TRAINING DEVICES.

IN SUMMARY, WE FEEL THAT THE MOVE OF PSA TO QUALITY CONTROL WAS COST EFFECTIVE, AND A WISE MANAGEMENT DECISION.

## **PSA PROBLEM AREA**

- **DA DIRECTED ANALYSIS OF POSITIONS**
- **RECLASSIFICATION OF POSITIONS**
- **CONVERSION ACTIONS ASAP**
- **PAY SCALE CUT**
- **RETAIN GRADE/RETAIN PAY**

PSA PROBLEM AREA

THERE IS ONE SERIOUS PROBLEM AREA RELATING TO PSA - A PROBLEM WHICH REALLY HAS NO RELATION TO THE STEP RECOMMENDATIONS, BUT MAY SERIOUSLY ADVERSELY AFFECT PSA PERFORMANCE IN THE FUTURE.

EARLIER THIS YEAR, DEPARTMENT OF THE ARMY DIRECTED A DETAILED ANALYSIS OF ALL WD AND WN PRODUCTION FACILITATING POSITIONS. THERE ARE 43 OF THESE POSITIONS IN OUR TWO PSA BRANCHES, AND 39 ARE ENCUMBERED.

OUR INITIAL REVIEW OF THE POSITIONS WAS COMPLETED AND SENT TO HQDESCOM IN FEBRUARY. BASED ON THE GUIDANCE RECEIVED WITH THE ARMY DIRECTIVE, IT WAS FOUND THAT ALL 43 OF THE POSITIONS SHOULD BE CHANGED TO A GS CLASSIFICATION. A GS-9 EQUIPMENT SPECIALIST CLASSIFICATION WAS RECOMMENDED FOR THE NONSUPERVISORY POSITIONS, WITH SUPERVISORY POSITIONS TO BE GRADED AS GS-11 AND GS-12.

YOUR STAFF COMPLETED THEIR REVIEW OF THE INITIAL FINDINGS AND ISSUED GUIDANCE FOR THE CONVERSION OF THESE POSITIONS TO GS. HQDARCOM HAS ASKED THAT CONVERSIONS BE EFFECTED

PSA PROBLEM AREA (CONT)

BY 22 MAY 1984. THIS REQUIREMENT MAY NOT BE MET IN SOME CASES, BUT ACTION WILL BE TAKEN AS SOON AS POSSIBLE.

THIS WILL MEAN A SEVERE CUT IN THE PAY SCALE OF THE PSA EXAMINERS, SINCE A WD-6, FOR EXAMPLE, IS EQUIVALENT IN PAY TO A WS-8, AND THIS IS \$2.18/HOUR MORE THAN THE PAY OF A GS-9.

ALTHOUGH APPROPRIATE PAY AND GRADE RETENTION REGULATIONS AND ACTIONS WILL BE APPLIED WHEN THE PERSONNEL CHANGES ARE EFFECTED, THE IMPACT IS MUCH MORE SEVERE THAN YOU MIGHT THINK. THE AFFECTED PERSONNEL WILL RETAIN THEIR GRADES FOR TWO YEARS, AND WILL RETAIN PAY INDEFINITELY. THIS, HOWEVER, IS ONLY PART OF THE STORY. EVERY EFFORT WILL BE MADE - BOTH INITIALLY AND ON AN ON-GOING BASIS - TO PLACE THESE PEOPLE IN POSITIONS WHERE THE GRADE IS EQUIVALENT IN PAY TO THEIR RETAIN PAY. THIS WILL MEAN THAT WE WILL HAVE A NUMBER OF VACANCIES IN PSA FOR WHICH VERY FEW PEOPLE CAN QUALIFY. OUR PRIMARY SOURCE FOR FILLING THESE JOBS IN THE PAST HAS BEEN MECHANICS AND INSPECTORS. THESE WAGE GRADE JOBS HAVE HIGHER PAY THAN GS-9; THEREFORE, THERE IS NO MONETARY INCENTIVE TO CHANGE. CONSEQUENTLY, WE WILL END UP FILLING THE

PSA PROBLEM AREA (CONT)

POSITIONS WITH TRAINEES, AND OUR LEVEL OF EXPERTISE WILL BE DRASTICALLY LOWERED. FURTHER, WE WILL ALSO HAVE, AS A CONTINUING ADVERSE IMPACT, THE SAME TYPE OF GRADE DISPARITY PROBLEMS THAT WE HAVE BEEN EXPERIENCING IN PRODUCTION CONTROL. THE PRIMARY REASON FOR THE OUTSTANDING SUCCESS OF OUR PSA FUNCTION HAS BEEN THE KNOWLEDGE, EXPERIENCE, AND ATTITUDES OF THE EMPLOYEES. WITH IMPLEMENTATION OF THE GRADE CHANGES, THIS WILL MOST LIKELY CHANGE.

MY MAJOR CONCERN IS THAT, UNDER THE OCM CONCEPT, PSA IS THE MOST IMPORTANT ELEMENT OF THE DEPOT MAKING DECISIONS ON WHAT PARTS OF THE AIRFRAME OR ENGINE NEED REPAIR OR REPLACEMENT. IF WE ARE TO REMOVE THE PROGRESSION AND EXPERIENCE BEING BROUGHT TO THESE EVALUATOR POSITIONS, WE WILL EMASCULATE THIS EXTREMELY IMPORTANT FUNCTION.

PPC FORECASTING FUNCTION TO DIR, SUPPLY

VIII-66

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PPC FORECASTING FUNCTION TO DIR, SUPPLY

DURING MY ORIGINAL STEP PRESENTATION, I POINTED OUT THAT THE INABILITY OF OUR SYSTEM TO PROVIDE PARTS TO MECHANICS IN A TIMELY MANNER CAUSED PRODUCTION PROBLEMS WHICH RESULTED IN UNEVEN WORKFLOW, UNSCHEDULED HOURS, MUCH EMPLOYEE FRUSTRATION, AND THE PROLIFERATION OF INFORMAL ACTIVITIES SUCH AS ROBBING PARTS FROM OTHER MECHANICS, OTHER AIRCRAFT, AND OTHER SHOPS. THE TRANSFER OF THE FORECASTING FUNCTION TO THE DIRECTORATE FOR SUPPLY WAS ONE OF THE CHANGES WE RECOMMENDED TO ALLEVIATE THAT SITUATION.

THIS HAS CHANGED THE PARTS PREPOSITIONING ROLE OF OUR SUPPLY PEOPLE FROM PASSIVE TO ACTIVE AND HAS ENABLED THEM TO BE MORE RESPONSIVE IN SUPPORT OF MAINTENANCE PRODUCTION SCHEDULES. IT HAS INVOLVED THEM DIRECTLY IN PARTS SUPPORT AND IS BEGINNING TO HAVE A POSITIVE IMPACT ON OUR FABRICATION AND PROCUREMENT EFFORTS. PERSONNEL ASSIGNED TO PRODUCTION CONTROL AND TO THE DIRECTORATE FOR SUPPLY HAVE STRENGTHENED THEIR COMMUNICATION LINK, RESULTING IN BETTER REQUISITIONING OF PARTS, AND AN IMPROVED FORECASTING FUNCTION.

THIS MOVE, ASIDE FROM PROBLEMS USUALLY ASSOCIATED WITH REORGANIZATIONS, WAS VERY SMOOTH AND SUCCESSFUL. IT IS DIFFICULT TO MEASURE EFFICIENCY OF THE FORECASTING FUNCTION



PPC FORECASTING FUNCTION TO DIR, SUPPLY (CONT)

SINCE IT IS INTERMINGLED WITH, AND DEPENDENT ON, ACTIONS TAKEN BY PRODUCTION CONTROL, DIR, SUPPLY, AND OTHER ORGANIZATIONS. I WILL, HOWEVER, SHOW YOU SOME INDICATORS WHICH ARE POSITIVE, AND WHICH GAUGE THE OVERALL EFFICIENCY OF PRODUCTION CONTROL, THE FORECASTERS, AND OTHER DIR, SUPPLY ELEMENTS INVOLVED IN PARTS AVAILABILITY.

## PARTS AVAILABILITY

### CCAD PRODUCTION:

FY83	PRODUCED	100%	MAJOR END ITEM PROGRAMS
FY83	PRODUCED	96%	OF ALL SMI PROGRAMS
FY84 THRU MAR	PRODUCED	99%	MAJOR END ITEMS
FY84 THRU MAR	PRODUCED	98%	SMI PROGRAMS

SMOOTH BALANCED FLOW OF ALL PROGRAMS ATTAINED THROUGH FIRST TWO QTRS FY84.

### CRITICAL ITEMS REPORTED

OCT THRU DEC FY 83	MONTHLY INWORK AVERAGE	253
OCT THRU DEC FY 84	MONTHLY INWORK AVERAGE	386

INCREASE OF 52.5%

PARTS AVAILABILITY (CHART 1)

AS YOU CAN SEE BY THIS CHART, WE HAVE ATTAINED OUR PRODUCTION GOALS. WHAT IS NOT SHOWN IS OUR ACHIEVEMENT OF A SMOOTH/BALANCED FLOW FOR THE FIRST TWO QUARTERS OF FY 84 - A FIRST IN CCAD HISTORY. CREDIT FOR THIS MUST BE EXTENDED TO ALL ELEMENTS OF OUR ORGANIZATION. HOWEVER, IF WE HAD NOT FORECASTED OUR REPAIR PARTS REQUIREMENTS ACCURATELY AND EFFICIENTLY, SMOOTH PRODUCTION WOULD NOT HAVE HAPPENED.

AT THE SAME TIME, REPORTS OF CRITICAL ITEMS (THOSE ITEMS WHICH ARE PRODUCING WORK STOPPAGES AND POTENTIAL WORK STOPPAGES) HAVE INCREASED BY 52%. THIS INDICATES THAT WE HAVE IMPROVED OUR COORDINATION AND COMMUNICATION EFFORTS; AND AS A RESULT WE ARE SCHEDULING AND PLANNING BETTER THAN EVER. WE DO NOT HAVE MORE PARTS PROBLEMS, WE HAVE BETTER REPORTING. THE TIMELY AND ACCURATE IDENTIFICATION OF THESE "POTENTIAL" WORK STOPPAGES GIVES US MORE VISIBILITY TO PLAN, SCHEDULE, AND EXPLORE ALTERNATE SOURCES BEFORE WE HAVE SERIOUS PRODUCTION SLIPPAGES.

# PARTS AVAILABILITY

## AIF USABLE INVENTORY

### MONTHS ON HAND

FY83            4.6  
FY84 THRU APRIL    3.0        = 35% DECREASE

## TOTAL NUMBER OF LINE ITEMS MANAGED BY ISA

FEB FY 83        54,435        APR FY 84        69,467 = 28% INCREASE

## TOTAL NUMBER OF ISSUES BY ISA

SECOND QUARTER FY 83        63,220        SECOND QUARTER FY 84        91,944  
INCREASE OF 45.4%

## TOTAL NUMBER OF LINES IN STORAGE

SECOND QUARTER FY 83        73,468        SECOND QUARTER FY 84        76,758  
INCREASE OF 4.3%

PARTS AVAILABILITY (CHART 2)

THIS CHART DEALS WITH AIF INVENTORY AND ISA STATISTICS.

OUR AIF USABLE INVENTORY ON HAND WAS LOWER IN APRIL 1984 THAN AT ANY TIME DURING FY83. THE NEXT FIGURES REFLECT MAJOR INCREASES IN OUR SUPPLY TRANSACTIONS. I SHOW THIS CHART ONLY TO QUANTIFY THE SCOPE OF CHANGES WE EXPERIENCED THIS PAST YEAR DURING IMPLEMENTATION OF THE STEP RECOMMENDATIONS. THESE CHANGES ARE MAINLY DUE TO OUR SPECIAL PROJECTS, AND THE APPROXIMATELY 300 NEW PROGRAMS FROM THE NEW CUMBERLAND WORKLOAD.

WE HAVE HAD A 28% INCREASE IN ACTIVE LINE ITEMS MANAGED, A 45% INCREASE IN NUMBERS OF ISSUES, AND A 4.3% INCREASE IN NUMBER OF LINE ITEMS IN STORAGE.

# MATERIEL REQUIREMENT LIST (MRL) REVIEWS

- ROLE CHANGE OF FORECASTERS
- ACCURACY AND TIMELINESS OF MRL REVIEW
- AVSCOM/DLA INVOLVEMENT

MATERIEL REQUIREMENT LIST (MRL) REVIEWS

THE FORECASTERS ARE NOW THE DIRECT LINK BETWEEN OUR PROGRAM REQUIREMENTS AND THE WHOLESALEERS. THEY MUST COMMUNICATE AND COORDINATE EFFECTIVELY TO ASSURE THAT THE CORRECT PARTS AND CORRECT QUANTITIES ARE PURCHASED FOR FUTURE NEEDS.

STEP, AND THE ROLE CHANGE OF THE FORECASTERS, RAISED THE ISSUE OF MATERIEL REQUIREMENT LIST (MRL) REVIEWS. THE MRL REVIEW; WHERE THE MECHANIC, PRODUCTION CONTROLLER, QUALITY, AND SUPPLY PERSONNEL WALK THRU ACTUAL CONSUMPTION RATES ON EACH LINE ITEM; IS MORE ACCURATE AND TIMELY THAN ANY OTHER PROCEDURE WE HAVE USED. WE NOW HAVE A MEMORANDUM OF UNDERSTANDING ON MRL REVIEWS WITH AVSCOM, AND THEY ARE FULLY RESOURCING THEM. THE DEFENSE LOGISTICS AGENCY HAS ATTENDED SEVERAL MRL REVIEWS AND THEY HAVE STATED THAT THEY WILL ATTEND ALL FUTURE REVIEWS. THIS IS ANOTHER FIRST.

CONSIDERING ALL OF THE FIGURES I HAVE SHOWN YOU REGARDING CCAD'S PARTS AVAILABILITY, AND THE IMPROVED MRL REVIEWS, I CONSIDER THE FORECAST MOVE FROM PPC DIVISION TO DIR, SUPPLY TO BE A POSITIVE MANAGEMENT ACTION; AND WE ANTICIPATE MORE GAINS AS WE CONTINUE REFINING OUR OPERATION.

## SUMMARY

- SUCESFUL STEP INITIATIVES
- "JURY STILL OUT" ON ONE INITIATIVE
- FUTURE STEP PROJECTS



SUMMARY

AS WITH ANY GROUP OF INITIATIVES OF THIS MAGNITUDE, THERE ARE SOME OF THEM WHICH WE ARE PREPARED TO CALL UNQUALIFIED SUCCESSES, AND OTHERS OF WHICH WE ARE NOT QUITE THAT CONFIDENT.

THE ONES WHICH WE FEEL COULD BE EXPORTED TO OTHER DESCOM DEPOTS, ALMOST INTACT - AS A COMPLETED PACKAGE - ARE THE PERFORMANCE TESTING PROGRAM, THE SUPERVISORY AND MANAGEMENT TRAINING PROGRAM, THE SUPERVISORY UNDERSTUDY PROGRAM, THE TECHNIQUE FOR DEVELOPING A DEPOT PHILOSOPHY, THE PROGRAM TO PROVIDE BETTER CAREER PROGRESSION OPPORTUNITIES TO EMPLOYEES IN DEAD-END JOBS, AND THE FORECASTING FUNCTION ORGANIZATIONAL CHANGE.

FOR THOSE DEPOTS WHO HAVE LIKE, OR SIMILAR, OPERATIONS - THE ASTORS AND PSA ORGANIZATIONAL CHANGES HAVE BEEN SIMILARLY SUCCESSFUL, AS HAS THE CREATION OF THE AIRCRAFT MOVER POSITIONS.

OUR PPC ORGANIZATIONAL CHANGE HAS BEEN MORE TRAUMATIC - UNDERSTANDABLY SO, SINCE IT AFFECTED SUCH A LARGE NUMBER OF OUR EMPLOYEES, AND THE NECESSARY TRAINING TO

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SUMMARY (CONT)

IMPLEMENT SUCCESSFULLY TOOK SO LONG TO COMPLETE. IT IS MY PERSONAL FEELING, HOWEVER, THAT THIS WILL PROVE TO BE A SOUND MANAGEMENT DECISION IN THE FINAL ANALYSIS.

THE MAINTENANCE VERIFIER, POSITION, HOWEVER, IS ANOTHER STORY - THIS IS THE ONE ON WHICH I FEEL THAT "THE JURY IS STILL OUT." THERE IS NOT MUCH DOUBT IN MY MIND THAT THIS INITIATIVE IS BASED ON A GOOD, SOLID FOUNDATION, AND IT CAN WORK - INDEED, IT HAS WORKED, AND IS CONTINUING TO WORK, IN MANY RESPECTS - BUT WE HAVE NOT YET MADE IT WORK IN EXACTLY THE WAY IN WHICH THE STEP DESIGN GROUP ENVISIONED IT. FOR THAT REASON, I AM NOT YET PREPARED TO CALL THE TEST OF THESE POSITIONS A SUCCESS. WE ARE GOING TO EXTEND THE TEST PERIOD FOR AT LEAST ANOTHER SIX MONTHS, AND IT WILL BE UP TO MY SUCCESSOR TO DETERMINE THE RESULTS OF THAT TEST.

IN CLOSING, I WANT TO SAY THAT I AM NOT SORRY THAT WE UNDERTOOK THE STEP PROJECT - I THINK THE DEPOT IS A BETTER PLACE TO WORK BECAUSE OF THIS EFFORT, AND WE HAVE ONLY BEGUN TO REAP THE BENEFITS FROM WHAT STEP ACCOMPLISHED - BUT I AM DISAPPOINTED IN

SUMMARY (CONT)

THE RESULTS IN TERMS OF DOLLAR SAVINGS AND PRODUCTIVITY INCREASES TO DATE. I THINK THAT THE REASON FOR THIS DISAPPOINTING RETURN ON OUR INVESTMENT IS THAT WE ALLOWED THE PROCESS TO ENCOMPASS TOO LARGE A PORTION OF OUR ORGANIZATION - WE SIMPLY BIT OFF MORE THAN WE COULD CHEW; AND WE DID IT AT THE WORST POSSIBLE TIME, A TIME WHEN WE WERE UNDERGOING TOO MANY OTHER CHANGES THAT HAD ADVERSE IMPACT ON WHAT WE WERE TRYING TO ACCOMPLISH WITH STEP. MY ADVICE, THEREFORE, TO ANYONE ELSE WHO WAS GOING TO INITIATE A STEP PROJECT, WOULD BE TO TARGET ON A SMALLER SEGMENT OF THEIR ORGANIZATION, AND TO PLACE A MORATORIUM ON OTHER SIGNIFICANT CHANGES IN THAT AREA UNTIL AFTER TOTAL IMPLEMENTATION OF THEIR STEP RECOMMENDATIONS.

THIS CONCLUDES MY BRIEFING.

The following performance measures are to be collected at the work center level: (if available)

Human

1. Lost hours due to:
  - a. Sickness
  - b. Disabling injuries on the job, workmen`s compensation, lost time, etc.
  - c. AWOL
  - d. Other "leave use" measures, e.g., administrative leave
2. Turnover
  - a. Voluntary (e.g., retirement, new job, leave the area, etc.)
  - b. Nonvoluntary (dismissed/fired)
3. Awards (letters of appreciation, promotions and quality increases)
4. Ratio of number of civilian Huey-related suggestions to number of suggestions adopted

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The following measures are to be measured at the individual level, i.e., for each individual in each work center.

Performance

1. Number of hours work per week per unit (UH-1H).
2. Number of hours spent on special projects at the Depot per week.
3. Number of hours per week on TDY on special projects.
4. Number of lost hours per week due to sickness, AWOL, administrative leave, disabling injuries, etc.
5. Number of rework hours per helicopters per week.

END