REACTION AND LEARNING AS PREDICTORS OF JOB PERFORMANCE IN A UNITED STATES AIR FORCE TECHNICAL TRAINING PROGRAM

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This study is based on Kirkpatrick's (1996) four level evaluation model. The study assessed the correlation between and among three levels of data that resulted from evaluation processes used in the U.S. Air Force technical training. The three levels of evaluation included trainee reaction (Level 1), test scores (Level 2), and job performance (Level 3). Level 1 data was obtained from the results of a 20 item survey that employed a 5-point Likert scale rating. Written test scores were used for Level 2 data. The Level 3 data was collected from supervisors of new graduates using a 5-point Likert scale survey.

The study was conducted on an existing database of Air Force technical training graduates. The subjects were trainees that graduated since the process of collecting and storing Levels 1 and 2 data in computerized database began. All subjects for this study graduated between March 1997 and January 1999. A total of 188 graduates from five Air Force specialties were included. Thirty-four cases were from a single course in the aircrew protection specialty area; 12 were from a single course in the munitions and weapons specialty area; and 142 were from three separate courses in the manned aerospace maintenance specialty area.

Pearson product moment correlation coefficients were computed to determine the correlation coefficients between Levels 1 and 2; Level 1 and 3; Level 2 and 3 for each

subject course. Multiple linear regression was used to determine the relationship between the composite of Levels 1 and 2 and Level 3.

There were significant correlation coefficients between Levels 1 and 2 and Levels 2 and 3 for only one of the five courses. The linear regression analysis revealed no significant correlation using the composite of Levels 1 and 2 as a predictor of Level 3.

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CHAPTER I

INTRODUCTION

Background

The primary training source for the U.S. Air Force is the Air Education and Training Command (AETC). The AETC trains approximately 380,000 students per year in over 2,300 initial skills and advanced technical, medical, and flying training courses. The total bill is over $4 billion annually. Such an investment warrants stringent training evaluation processes to ensure the efficiency and effectiveness of training, and the AETC has many processes in place to conduct training evaluation. These methods are discussed in detail in the following section.

Theoretical Framework

The theoretical framework for this study is based primarily on Kirkpatrick's (1996) four-level model of evaluation. His model is highly adaptable and most closely parallels current Air Force evaluation methodology.

The Purpose of Evaluation

Why do the Air Force and other organizations attempt the unruly task of evaluating training? Opinions concerning the purpose of evaluation are diverse among trainers. Some insist that the results of training should be measurable in increased productivity, increased quality, fewer accidents, or some other cost related criteria that are directly observable. Some believe strongly in the value of more abstract results of training, such as employee morale, and seek only to measure training from that perspective. Still others are satisfied with knowing that the training provided has increased knowledge. Phillips (1991) recommended evaluating for the above-mentioned reasons as well as to determine appropriate target populations and marketing strategies for future training programs. The Air Force policy on instructional evaluation is based more on procedure than on a specific philosophy. These procedural requirements are set forth in regulatory documentation.

Although philosophical opinions differ, most all trainers agree that evaluation is essential. The purpose of evaluation is multifaceted and is dependent upon many situational variables. The goals and objectives of the course should be used to determine evaluation processes. Most reputable designers wouldn't think of developing course without following a well devised development plan. However, evaluation is often practiced haphazardly with little regard to the need for a planned process. Most organizations require some philosophical foundation to guide the evaluation process.

Evaluating to Determine Instructional Design Effectiveness.

Most trainers invest heavily in their time and their companies' resources in complex design, development, and delivery methodologies. Effective training evaluation provides the necessary feedback to determine the effectiveness and efficiency of design and delivery components. Evaluation is integral to sound instructional design. The assumed reason for most training is that the acquired skills and knowledges will be transferred to the job. To make such a complex determination, evaluation must be designed into the training. The designer must place evaluation at the forefront of all design activities. Associating training objectives with organizational goals is essential to effective training design and cannot be approached without considering how this association will be measured.

Evaluating to Determine Instructional Delivery Efficiency and Effectiveness

Instructional delivery methodology is becoming increasingly more diverse and complex. Computer-based and web-based training are becoming the norm. Electronic performance support systems provide training with the most precise timing of any instructional approach to date. Investments in such technology demands extensive evaluation of its effectiveness. Only through effective evaluation processes can the trainer ascertain whether the training goal has been met and to what degree.

Evaluating to Determine Return on Investment (ROI) – The Ultimate Goal

The ultimate purpose of training evaluation is to determine the worth of the training. According to Barron (1998), as training consumes larger portions of corporate and government budgets, there is increasing pressure to determine the return on training investment, which has created significant debate within the training community. However, given the recent flurry of methodological development in this area, one can easily conclude that ROI is gaining strength as a necessary measure in the training discipline. Phillips (1991) developed a comprehensive inventory of reasons as to why

ROI is gaining so much attention. Some of the more critical aspects of evaluation from a profit perspective include the more obvious elements of determining increased value in organizational output, cost savings, and time savings. There are also many cost related training results that are more difficult to assess. A few of these include penalty avoidance, improved morale, and reduced absenteeism.

Many trainers believe that some benefits of training, such as employee morale and the positive effect that training has on turnover, defy monetary measures. There is also the issue of the cost of conducting such complex procedures. ROI processes can be costly to conduct and in some cases would cost more than the training itself (Baermen and Cahill 1998). There is also the debate concerning whether training can be adequately isolated from complex organizational and situational variables for the purpose of evaluation. Although most arguments concerning evaluation have merit, almost no one argues against the need for evaluation. Furthermore, any trainer would find it difficult to deny the benefit of being able to provide evidence that demonstrates the contribution of training programs to the company's profitability. Phillips (1991) reviewed and summarized many effective models for the purpose of measuring ROI. ROI must begin with analysis of direct costs of training such as trainer, trainee, and support staff salaries for actual training time. There are also the indirect costs associated with facilities, utilities, expendable training supplies, training equipment, support and development equipment, and development and analysis time spent by the training staff. A wide range of methodologies is available, including the simple approach of determining the training costs and subtracting it from tangible benefits of training to produce a net profit figure.

Phillips also reviewed some rather sophisticated statistical models, such as "utility analysis," which is based on the duration of the training effect and standard deviation between trained and untrained groups. Selection of ROI models for application should be guided by the expertise of the evaluator, time and resources available to apply processes, and organizational policy regarding ROI.

Some of the factors required to measure ROI are readily available in the Air Force system of evaluation. Costs of training operations can be determined precisely. However, since the organizational goal of training is not profit, the return component of ROI is extremely difficult to define and even more difficult to assess. The Air Force has such diverse, widespread, and dynamic mission requirements, that determining if training is worth the exact investment is not plausible. Hence, ROI will not be considered in the current study.

Evaluation Methods and Models

There are many models on which trainers base their evaluation processes. Those included here are ones that have received the attention of evaluation experts based on the strengths each has for application to training situations. Most are considered to be a theoretical basis from which to develop processes suited to meet the individual training situation. Trainers normally do not follow stringent guidelines for any component of the training discipline.

Kirkpatrick

Kirkpatrick's (1996) four-level model is perhaps the most widely known and emulated approach to training evaluation. The model was first designed in 1959, and Kirkpatrick has published many subsequent works and books that have reinforced it as the evaluation standard within the training community. His 1996 work is the primary source of information for the current study and review. Many theorists and practitioners have revised his model, but few have significantly changed the basic foundational elements of the original framework. Many used different terminology or modified one or more of the levels. However, most incorporate Kirkpatrick's four levels in one form or another and do not depart from his basic hierarchical approach. This model also most closely matches current Air Force evaluation methodology. Kirkpatrick (1996) proposed four levels of evaluation in his model: (a) reaction, (b) learning, (c) behavior, and (d) results. Reaction (Level 1) is normally assessed through some form of survey instrument that elicits student opinions on a variety of instructional factors. Students are asked to evaluate variables including instructor performance, classroom environment, and instructional materials. Learning (Level 2) is normally assessed through formal knowledge or performance measurement. Although, there are exceptions, most technical training measurement is criterion referenced. Behavior (Level 3) measures training effectiveness as related to job performance. This level of evaluation is more difficult to assess and is practiced less often. Results (Level 4) measures training outcome as related to organizational impact and involves the assessment of such factors as employee morale, absenteeism, and turnover all of which effect on productivity and profitability. This level of evaluation is often referred to as return on investment (ROI) assessment. As a consequence of less application by practitioners, fewer valid methodologies found for levels 3 and 4. Throughout the remainder of this study, the terms level 1, level 2, level 3, and level 4 refer to the respective terms of reaction, learning, behavior, and results.

Hamblin

Hamblin (1974) extended Kirkpatrick's model into five levels. The first three levels of his model are identical to the first three of Kirkpatrick's model. He then divided the level into two separate levels. His new Level 4 evaluation assessed organizational variables, and he added Level 5, which assesses ultimate variables. Organizational variables are economically indirect factors, such as productivity, morale, and absenteeism. Ultimate value variables are those that have direct economic impact, such as sales, costs, and profits.

The Bell System and IBM Approaches.

Jackson and Kulp (1979) devised a training evaluation model for Bell Systems prior to divestiture of AT&T. They strove to measure training in terms of outcomes at the following four levels: reaction, capability, application, and worth. Similarly, Gordon (1987) devised a model for IBM in which the four steps were labeled reaction, testing, application, and business results. The differences between these models and Kirkpatrick's (1996) model are more semantical than philosophical. The purpose and description of the levels in each of these models are identical those of Kirkpatrick's.

The CIPP and CIRO Models

Galvin (1983) proposed the use of the CIPP model that was developed by educators on the National Study Committee on Evaluation of Phi Delta Kappa. The CIPP model approaches evaluation in a slightly different manner than the Kirkpatrick style models. Although CIPP was designed for educational applications, it has been well received by the training community. CIPP is an acronym representing the steps of the process: context evaluation, input evaluation, process evaluation, and product evaluation. This model takes a broader view of evaluation and involves more formative evaluation than most others. The first two levels deal with needs analysis and instructional design. The last two levels concern the traditional evaluation processes of student reaction and learning and are similar to processes involved in Kirkpatrick's model (1996). There is no ROI component to this model.

The CIRO model was devised by Warr, Bird, and Rackham (1979). CIRO is an acronym for context, input, reaction, and outcome. This model is very similar to the CIPP model and includes formative evaluation processes related to needs analysis and design.

Within the above-described models, there are many proposed methods of data collection, instrumentation, and analysis; however, the underlying philosophy and concept of training evaluation are relatively constant across the different approaches.

The Air Force Approach to Evaluation.

The Air Force evaluation system parallels the first three levels of Kirkpatrick's (1996) model. These are discussed below. Currently no processes exists by which to assess organizational impact or return on investment. Although there is a need to achieve Level 4 in evaluating Air Force training, this study is concerned with a correlational comparison of the first three levels only. Any organization attempting to employ the four levels of evaluations must first understand the implications and applications of the first three before attempting Level 4, the most difficult.

Level 1 evaluation–student feedback. Student feedback data are collected from all technical training attendees in all courses. A computerized 45-item instrument, the 82D Training Group Student Feedback Survey, is employed to solicit student opinions on the quality of instruction, curriculum, measurement, instructional aids and equipment, and base support facilities and services. Of the items on the survey, 20 deal directly with instructional factors, and the remainder with support services such as living quarters and dining facilities. A copy of this survey is included in Appendix A.

Level 2 evaluation–written and performance testing. Some discussion as to the hierarchy of the course control documents is necessary to explain the next two levels of evaluation. The training command is basically under contract to the operational commands to provide initial and advanced training for all Air Force specialties. A document called a training standard could be considered the contract vehicle. The training standard lists the major tasks of the specialty. Which items are to be included in the training and to what degree are established by assigning a training proficiency code to each task. This code indicates whether psychomotor or cognitive training is required. Training standard items on which psychomotor training is required are coded with a number and lower case letter, such as 2b. The number indicates the degree of proficiency required in the form of behavior, and the letter indicates the same for the cognitive component of the task (referred to in the proficiency code key as task knowledge). Training standard items that require cognitive training are coded with upper case letters only. In cases in which lack of time or equipment constrains instruction, only task knowledge is taught, with no actual psychomotor performance required. In such cases the training standard items are coded with a lower case letter only, such as b. Appendix B contains a typical training standard and a proficiency code key to aid in interpreting the codes.

All resident technical training requires written tests. There must be at least one written test item to measure each knowledge-based objective. Performance can be measured solely by performance testing if task knowledge is inherently demonstrated through the task performance. Performance testing is accomplished normally on one objective at a time. Written tests are criterion referenced, and each has a predetermined cut score of no less than 65 percent. These tests are administered at various points throughout a course, normally at a point not exceeding 40 hours of instruction. Tests most commonly consist of 25 to 50 multiple choice selection-type items. Each is assigned to a specific objective. Most are administered, scored, and analyzed via computer software. Written tests are checked for content validity through a stringent review process. Subject matter and instructional design experts conduct a review of each item for item-objective congruence. Items that are accepted for inclusion in the tests are checked against a table of specifications. Test scores are also checked for reliability through a parallel forms process. Each test is administered on a trial basis to a minimum of three classes each. The composite average for each test must be within five percentage points of the other.

Level 3 evaluation–field evaluation (job performance). The Air Force currently relies on the field evaluation questionnaire (FEQ) process to collect information concerning the job performance of graduates. The FEQ is accomplished selectively and measures a specific population of graduates over a specified time period. The targets are normally graduates who have been on the job between 6 and 12 months, and the survey is conducted on all of the trainees who graduated during the specified time period. A survey questionnaire is developed that contains only those training standard items on which psychomotor training was provided. Graduates and their supervisors are asked to rate, on a 5-point Likert scale, how well the graduate was prepared to perform each task. An overall rating of the graduate on the same scale is also required of the supervisor. This overall rating is used as the data for Level 3 evaluation in this study. Return rates for these surveys are typically over 90 %.

Operational readiness. The ultimate indicator of training success is whether or not operational commands are mission ready and capable. Operational success is assessed through such activities as biannual operational readiness inspections (ORI) and other peacetime simulations and practices performed constantly throughout the Air Force operational commands. Appendix C contains a typical FEQ survey and report.

Data consumption. Data from the above processes are used for various reasons. Data from the student feedback process are reported in aggregate form on a periodic basis, normally by quarter. The goal is for all courses to achieve a 4.0 average on the 5-

point scale for the 20 questions concerning training. When course areas fall below that point, course managers assess the reason and take corrective action. Instructors use student feedback data to assess student satisfaction with their presentation styles and skills. Curriculum developers use the data to determine whether or not students are satisfied with the course content and to determine the effectiveness of instructional design, training aids, and measurement. Supervisors of instructors and developers use the data to some degree to complete annual employee performance reports. The description of the above process has been highly generalized; there is no structured process to guide the analysis and application of Level 1 data. Therefore, there is a great deal of diversity in how the data are interpreted and used.

Written and performance test data are used to determine student progress from one level of instruction to the next and ultimately as a graduation requirement. Scoring processes are standardized and objective. However, the application and interpretation of tests data are subject to the instructors' and course managers' judgments.

FEQ data are reported to course managers in both aggregate and individual graduate formats. If the total surveyed population receives an average rating of less than 80 % satisfactory on any one training standard item, the managers are required to investigate to determine both the cause and the corrective action.

Significance of the Study

The instructional systems approach employed by the U.S. Air Force is complex and has global implications. The potential result of failures or weaknesses in an instructional system is the loss of lives and/or multimillion-dollar aircraft. Managers of these systems must be able to pinpoint problems and make critical decisions on a daily basis. Instructional presentation, measurement, curriculum, equipment, target population, prerequisite skills, and job inventories are among the many factors that must be considered by decision makers when solving a systemic problem. Evaluation data are among the most critical sources of data concerning these factors. This study will contribute to the existing body of research that provides guidance to Air Force trainers on how to interpret different types and levels of evaluation data. Many resources are available to trainers on how and when to collect evaluation data; however, there is a significant void in the literature concerning how the results of evaluation data should be interpreted and applied. This study explores the relationship between and among the first three levels of evaluation as defined by Kirkpatrick's (1996) model. Although the results can be generalized only to the Air Force career field specialties included in the study, the methodology is suitable for almost any training scenario.

The Air Force has a serious need of a structured approach to evaluation that lends meaning to each level of data and guides its managers to accurate conclusions about training outcomes, thus facilitating wise decision making. Most of the Air Force technical training faculty are career military and civilian employees. Military members rotate in from operational assignments to conduct a tour of instructional duty, then return to the field. These career technicians have a vested interest in the graduates they produce. The graduate could possibly work for colleagues, if not for the instructors themselves at some point after receiving training. However, it is likely that the Air Force will soon lose this informal system of quality assurance. The Air Force has concentrated over the past several years on streamlining its combat forces through extensive drawdowns in personnel and mission realignments. General Ryan, Air Force Chief of Staff, stated in his February 1999 web site address that “now is the time to focus on identifying and freeing up excess resources committed to our support functions (Ryan, 1999).” Prior to this address, a 1997 program called Jump Start which was initiated to identify competitive sourcing and privatization (CS&P) candidates, resulted in AETC requirements to privatize some 5,800 positions by the year 2003. Thus, it appears that a major portion of the Air Force training discipline will be turned over to private contractors in the near future. Under current evaluation processes, the quality of training will be subject to contractual language and the integrity of service providers, and this situation demonstrates that a systematic approach to evaluation is paramount to successful privatization of military training. Furthermore, the problem of adequate evaluation processes is not limited to the military.

Of the $60 billion dollars spent on private industry training in the United States, $42 billion goes to internal training staff (Gordon, 1998). This cost represents a 26 % increase since 1993. With such inflation in costs, trainers for the Air Force, the military in general, and private business are sure to feel more pressure to prove their worth, and they will have to rely upon proven evaluation methods to demonstrate the value of their training programs.

Purpose of the Study

The purpose of this study was to determine the relationships between and among the three levels of the U.S. Air Force evaluation process. The study was designed to explore whether or not lower levels of evaluation data can be used as predictors of evaluation outcomes at subsequently higher levels. Changes in evaluation approaches will require significant revision to the AETC policy and guidance. Such information will serve as the foundation for changes in evaluation policy and methodology in Air Force technical training.

Statement of the Problem

Training methodology and technology applications have advanced at a rapid pace over the past few decades. Given the pace of technological advancements in training, state-of-the-art is almost impossible to define; yet, surprisingly few advances have been made in evaluation methodologies.

Since its inception, Kirkpatrick's (1996) model has been assumed by many to be hierarchical in nature. In other words, each level of evaluation has an assumed relationship to successive levels. Holton (1996) suggested that Kirkpatrick's model does not truly meet the criteria for a model and is better suited for use as a taxonomy. Bobko and Russell (1991) explained that taxonomies are the link between the initial stages and final confirmatory stages of developing theory. Holton proclaimed that Kirkpatrick's model falls short of completing this theoretical process and expressed a need for a true model that indeed demonstrated linearity and relationships among levels.

The practice of assuming linearity is due in part to the accessibility of Levels 1 and 2 data. Data can be collected with relatively little expense and effort at these levels. The Air Force is no different in it assumptions and practices. It applies Levels 1 and 2 methodology to all its graduates. However, Level 3 evaluation is attempted on fewer than 25 percent of the graduates. Furthermore, no scientific selection process exists for field-evaluation candidates. Courses are often selected because of recent revisions to the curriculum or at the prompting of a course manager.

There is also the problem of no documented structured system to guide the consumption and application of Level 1 and 2 data. These data are employed to make critical decisions daily. Student feedback is used to evaluate instructor and organizational performance, yet there is no documented evidence that positive reactions to learning in this particular environment are indicative of instructional quality or effectiveness. Written test scores are used as requirements for progression through a course and ultimately as the graduation requirement. However, written test scores are never correlated to the results of field evaluation and thus cannot be deemed to possess criterion validity (Linn & Gronlund, 1995). An exploration of the real meaning of each type of data is imperative before the making of critical decisions.

To ensure training effectiveness, the Air Force must strengthen its system of evaluation. One way is to collect Level 3 data in a manner that produces more statistically significant results that can be generalized to a broader population of graduates. Another is to ensure that accurate predictions about graduate job performance can be made from levels 1 and 2 data. The results of this study and similar subsequent studies will provide the foundation from which policy makers can effect such a change.

Hypotheses

Ho_1: There will be no statistically significant relationship between Level 1 and Level 2 evaluation results at the .01 level of significance.

Ho_2: There will be no statistically significant relationship between Level 1 and Level 3 evaluation results at the .01 level of significance.

Ho_3: There will be no statistically significant relationship between Level 2 and Level 3 evaluation results at the .01 level of significance.

Ho_4: There will be no statistically significant relationship between the composite of levels one and two and Level 3 evaluation results at the .01 level of significance.

Delimitations

The storage of Air Force training evaluation data in a format that facilitates retrieval for correlational analysis is a relatively new process. This study utilizes data only from trainees that have graduated since the process of collecting and storing Levels 1 and 2 data in computerized database began. All subjects graduated between March 1997 January 1999.

Limitations

The study is limited by the subjectivity of the instrumentation that was used in the data collection process. Although all raters are considered interchangeable, some rater error is inevitable.

Definition of Terms

The following are definitions of the terms used in this study:

Student Feedback – subjective information solicited from students of all Air Force technical training schools through a standardized questionnaire with a 5-point Likert scale.

Course Score – the average of a student's collective test scores across the entire course.

Initial Skills Course – an entry-level course that prepares new Air Force recruits to perform in a limited capacity on the job.

Advanced Course – technical training designed for members of an Air Force specialty who have reached a specified level of experience.

Field Evaluation Questionnaire (FEQ) – a questionnaire used to survey graduates of technical training and their supervisors to determine their ability to perform specific tasks for which they were trained in technical school

Competitive Sourcing and Privatization – a process by which the Air Force seeks to find more efficient methods and sources to provide support services.

Training Standard – a document that lists the major tasks performed in an Air Force specialty. The document serves as a type of contract vehicle between the operational commands and training command to specify exactly tasks for which training is to be provided and the degree of proficiency to which trainees are to be trained.

Operational Command – the various commands throughout the Air Force with combat-related missions, such as Air Combat Command, Air Force, Materiel Command, Air Force Logisitcs Command.

Air Education and Training Command (AETC) – a support command responsible for the training of all Air Force accessions.

Field Evaluation Questionnaire – a process by which graduates of AETC and their supervisors are surveyed to solicit their opinion of the degree of preparedness to perform on the job upon completion of training.

Student Automated Feedback System (SAFIS) – a computerized 5-point Likert scale questionnaire designed to solicit student feedback concerning training issues, including instructional presentation, instructional materials, measurement, and support functions.

Air Force Specialty – a specific job, to which Air Force members are assigned upon induction into the Air Force, such as aircraft maintenance technician, electrician, and finance and accounting technician.

Basic Training – a 30-day indoctrination training provided all enlisted members of the Air Force designed to provide an overview of the Air Force and its mission. This training also provides critical military initiation training.

Initial Skills Training – entry-level skills training provided to all Air force members upon completion of basic training.

Supplemental Training – advanced technical training designed for experienced members of an Air Force specialty at specific stages in their career growth.

Summary

Business and government are spending ever-increasing amounts on training. This spending indicates the value placed on training. However, training professionals must not become complacent, thinking that this trend of increasing training budgets provides them guaranteed employment. In fact, the inverse is more likely to be true. Phillpps (1991) recounts the period in which IBM was hitting a plateau in its growth, and asked its training department to return $200 million of its $900 million dollar budget. The director told management the it would be difficult to know what to cut without damaging the company. This situation is a prime example of why training departments must be prepared to demonstrate their worth. As organizations spend more on training, managers are more inclined to want to see a return on what they have invested. Trainers will be challenged to adapt a business sense to complement their technical knowledge if they are to survive in the future. Just knowing that training is necessary and valuable is not enough. Trainers must be able to make their cases in boardrooms, with evidence of the value of training. Training evaluation is no longer just another component of the program; it is essential to survival.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

This review of literature was confined to studies of correlation among the various levels of evaluation. Collectively, the results of the research are inconclusive. This inconclusiveness is due in part to the relatively low number of studies devoted to exploring the linear relationship of evaluation levels. Although there is extensive literature on data collection and analysis methodologies for all four levels of evaluation, surprisingly few studies explored the relationships among the levels. Alliger and Janak (1989) conducted an extensive investigation of studies concerning Kirkpatrick's (1996) model and reported finding that only 12 relevant articles published since 1959 had studied correlation among evaluation levels. Clement (1982) reported seven studies that evaluated reactions and learning but found that none were correlational in nature.

To make the matter more perplexing, authors and designers of applied methods for evaluation models rarely address the subject of linearity within models. The nature of many published methodologies suggests that the authors simply assume that such linearity exists or that it has no bearing on evaluation outcomes. Hamblin (1974) is one such widely recognized author of evaluation methodology. He theorized a hierarchical linear relationship among the levels in his model, of which the first three levels are exactly parallel to Kirkpatrick's. However, this relationship among the levels of his model is somewhat presumptuous and without adequate scientific foundation. He provides no scientific evidence of a definitive linear relationship across the levels of his model. Since responsibilities for evaluation vary according to organizational structure, the terms trainer and evaluator are considered interchangeable throughout this document.

Level 1 as a Predictor of Levels 2 and 3

All of the studies that were reviewed simultaneously considered Level 1 as a predictor of Levels 2 and 3. Therefore, the review of the results in this section is reported accordingly. Studies that involved Level 1 data yielded the most conflicting results. Alliger and Janak (1989), in their meta-analysis of training evaluation studies, concluded that the relationship between Levels 1 and 2 is weak. However, in a similar review of studies, Clement (1982) reported a positive relationship between Levels 1 and 2. Such disparities in conclusions are pervasive throughout the literature. Close scrutiny of each study reveals a plausible explanation for such widely varying results. Each of the studies reviewed was directed toward correlational analysis of data from different evaluation levels. However, beyond that point, the commonalties in the evaluation process became few. In each study, the researcher had explicit evaluation goals and designed the instrumentation and analysis methodology accordingly.

How trainees respond to training from a Level 1 evaluation perspective is easily influenced by a number of variables. Variations in how trainees respond to training can be influenced significantly by one or more of the following: (a) evaluation methodologies and instrumentation, (b) characteristics of the trainee target population, or (c) organizational environment.

Evaluation Methodology and Instrumentation

The types of questions asked of the trainees greatly influence the outcome of Level 1 data. Kirkpatrick (1996) recommended the collection of trainee responses to the instructor, the course content, and facilities. However, the question of research is not always so straightforward and simplistic. The following summaries of research findings demonstrate the degree of influence exerted by methodology and instrumentation over Level 1 findings, as well as the complexity of data characteristics at Level 1.

Swierczek and Carmichael (1985) found a positive relationship between Levels 1 and 2 in a course designed to train supervisors. Their approach to evaluating training outcomes was to use both quantitative and qualitative measures. They used short, open-ended questionnaires to solicit qualitative Level 1 data concerning the trainees' perception of how much they had learned. They found that these perceptions matched the instructional goals of the training. However, no formal written measurement was mentioned in the report to substantiate the trainees' perceptions of learning increases. They employed pre- and post survey instruments during the training to measure changes in management-style philosophy and found a positive relationship between this Level 2 measure and the Level 1 measure. This multifaceted methodology revealed some of the complexities involved when attempting to understand the true meaning of Level 1 data. The researchers in this case were interested only in Level 1 data only as it concerned trainees' perceptions of what they had learned. This perception measure was positively related to the qualitative assessment of skills learned, as well as job performance. The researchers also collected typical Level 1 responses concerning workshop quality and reported favorable results, but they did not attempt to correlate those findings in the analysis. A correlational analysis of this data may have influenced the outcome.

In another correlational study, Tannenbaum, Mathiue, Salas, and Cannon-Bowers (1991) took a more complex approach to Level 1 data. They were interested in determining the relationship between trainee reaction and post-training organizational commitment. They also were interested in determining the relationship between training fulfillment and organizational commitment. Both trainee reactions and fulfillment are considered Level 1 measures with organizational commitment serving as the Level 3 measure. No Level 2 measures were considered in this study. The authors defined training fulfillment as "the extent to which training meets or fulfills a trainee's expectations (p 760)." The researchers proposed that comparing trainee expectations with perceptions is insufficient because no way exists to gauge or weight the importance of the impact of discrepancies between the two. They point out that "different trainees may have the same expectations, (for example, that training may be challenging), but one trainee might desire such a challenge, and another might prefer easy training (pp 760)." Consequently, they employed a weighted discrepancy model to account for these differences in desirability. The results of the study demonstrated a positive relationship between both of the Level 1 measures and the Level 3 measure. This case clearly demonstrates the complexity of Level 1 data. Level 1 evaluation often goes well beyond simply determining how the trainees felt about the training. Accounting for the influence of variables in such a robust manner increases the value and applicability of Level 1 data. When such practices are integral to the evaluation process, trainers are able to determine more precisely the meaning of trainee reactions.

Clement (1982) studied the relationship of Levels 1, 2 and 3 on supervisory training for state government employees who were newly assigned to supervision duties. Although he based his study on Hamblin's (1974) model, he studied only the first three levels, which are exactly parallel to Kirkpatrick's (1996) model. The course was designed to teach managing, communicating, and job training skills. The average trainee response was 5.5 on a 7 point scale. Pre- and post-test analysis found significant increases in learning on all three skills taught in the course. Performance on each skill was then correlated to Level 1 data. However, the only significant correlation between Levels 1 and 2 was in communication skills. In this study the researcher was interested only in a straightforward analysis of the relationship between each level and the others. However, his findings led him to conclude that " we need to take a broader view of the background from which the trainee comes and the environment to which he or she returns (p 183)." Clement theorized a revised model of Hamblin's (1974) hierarchy of training in which influencing variables must be considered at each level of evaluation. He proposed that trainee readiness, motivation, and opportunities for practice and feedback during the course influence the relationship between Levels 1 and 2. Opportunities to apply training on the job as well as similarities between training and job conditions must be considered when relating Level 2 to Level 3. Internal factors such as superiors and peers, along with external environmental factors such as economical and governmental influences also influence evaluation outcomes.

These studies clearly demonstrate the level of influence exerted by the individual evaluation goals of the researchers. Each was evaluating different aspects of the training and employed instrumentation and methodologies suited to those evaluation goals. These results indicate the need for well-defined evaluation goals that should be established prior to data collection and analysis. Phillips (1991) proposed the same rigorous validation process for survey instruments that is used for written tests. This validation process would require the designers of such instruments clearly to define the goal of their data collection.

Characteristics of the Trainee Target Population

There are many trainee characteristics and qualities to consider when designing evaluation processes. Age, gender, experience level, aptitude, motivation, and social background are but a few of the characteristics that significantly influence trainee responses. Of these characteristics, trainee motivation has received the most attention by researchers. Baldwin, Magjuka, and Loher (1991) demonstrated a positive link between motivation and learning. Motivation has been studied extensively for its effects on training outcomes, evidence exists that motivation is directly related to the affectivity of how students respond to training. However, it is difficult to determine whether positive reaction is an antecedent to motivation or vice versa. Mathieu, Tannenbaum, and Salas (1992) found trainee reaction to be more positively related to learning when motivation acted as a moderator. They concluded that, had they considered Level 1 data in isolation, no significant relationship would have existed between Levels 1 and 2. However, when other situational variables were considered, Level 1 was positively related to Level 2. The best results were observed when trainee reaction and motivation were both positive. Baldwin et al. (1991) also found that Level 1 data, when considered concurrently with motivation, was positively related to Level 2. In their study motivation was higher among trainees who were given their choice of training. The influence of choice on motivation in this case was further evidenced in the conclusion that those who were asked to choose, but were assigned to other training had fewer positive results than did those who were assigned to training without choice. Although assignment to training status should be accounted for as an influencing variable, it may not be of consequence where learning and job performance are concerned. Trainees who are forced to attend training may very well learn and apply the skills on job, but they may not react positively when asked questions about the training.

The concept that the outcome of Level 1 evaluation is particularly sensitive to issues regarding the trainees has initiated some debate as to the value of assessing trainee reactions. Conway and Ross (1984) found that trainees tended to underestimate their pre-training skills and to overestimate their post-training skills. Their findings are consistent with social psychology research that indicates that people have a strong need to justify their behavior (Boverie Mulchay, & Zondlo 1994). From the evaluation perspective, the subject behavior is attending training. Participants may feel the need to justify time away from critical workloads and costs to employers to provide training.

Fisher and Weinberg (1988) warned that Level 1 data can be inaccurate because trainees have a tendency to tell the trainers what they want to hear. The integrity of feedback may be directly related to how the trainees perceive the position of the trainer within the organizational structure. Human resource departments are often viewed as a powerful component of the organization. In the current study, the trainer/trainee relationship is further subordinated by military rank structure. Anonymity during surveying processes would probably increase the level of honesty in responses, but it would preclude the pairing of subject data from each level for correlation purposes.

Considering the difficulties associated with Level 1 data it is no wonder that it is not always analyzed stringently. Dixon (1987) goes so far as to suggest that “the use of participant reaction forms can cause more problems than benefits for the training function of an organization.” Boverie et al. (1994) summed up Dixon’s position as follows:

> Three major problems result from the use of reaction forms:
>
> <u>1. The expectation that training must be entertaining.</u> Because reaction sheets measure how the participants felt about the training, the trainer may tend to emphasize participant enjoyment during the training rather than substantive information. As a trainer is often rewarded with high marks when the participants enjoy themselves, this relationship between evaluation and participant enjoyment can become a vicious cycle. The trainer's ratings are also a major factor in the rewards that the trainer receives from management or the client organization: renewal of a contract or a promotion. Obviously, under these circumstances the use of a reaction sheet can lead to a conflict of interest.

2. Faulty instructional design. The term "faulty instructional design" refers to a questionnaire design that asks for information that participants cannot legitimately provide. As Dixon (1987) states, the art of questionnaire design is to ask questions for which a participant can give informed responses.

3. The perception that learning is passive rather than active. This perception refers to the common belief that it is the trainer's responsibility to ensure that participant learning occurs. Measuring how well this responsibility has been met with a reaction sheet is problematic, as a reaction sheet asks questions about the trainer's performance and the course design without asking about the participants' efforts to learn. Dixon emphasizes that evaluation and learning are not complete unless both functions have been measured. Ultimately, it is the responsibility of the trainer to provide information and the responsibility of the participant and the trainer to process the information. Reaction sheets rarely take into account the participant's role as part of the training program.

Alliger and Janak (1989) offered support for Dixon’s (1987) point of view with their proposition that “perhaps it is only when trainees are challenged to the point of experiencing the training as somewhat unpleasant (p 334).” There is a lack of evidence that positive reaction to training is a necessary component of learning. Tannenbaum et al. (1991) concluded, that although trainee expectations may be that same, their desires may vary greatly. As they pointed out, whether the trainees view the attributes of training as desirable will influence how they respond. Dixon’s point is well taken that trainees are not always qualified to answer questions concerning the course. As she so aptly stated, "In effect, participants may not know if they have mastered a complex skill (p 110)." Participants in initial skills courses are not likely to have adequate experience in the technical aspect of the course from which to evaluate course content. Conversely, experienced supervisors and manager may have great insight into their training needs and can assess the course content from a practical application perspective. Although Dixon's point should be considered, her advice should be interpreted as a need to be more systematic in the collection and analysis of Level 1 data. As demonstrated by the other citations in the current study, there is too much to be gained from effective Level 1 processes to consider completely abandoning this level of evaluation. In many of the above-mentioned studies, sufficient evidence is documented that Level 1 data can provide trainers with valuable information concerning their training programs and the trainees who attend them. Level 1 data can disclose information to the trainer about the trainees that is available from no other source. Without Level 1 data, information concerning many of the population characteristics that influence learning will not be available for consideration. Holton (1996) stated that "although these studies suggest that trainee reactions are unrelated to learning, as a practical matter few practitioners can afford to ignore totally the reaction of their trainees (p 10)."

Most trainers would agree that trainees can provide valuable information that cannot be garnered from any other source. If a class tells a trainer that a particular training aid, analogy, or instructional technique or activity was confusing or failed to help make the point, the trainer would be foolish to discount such information on the basis that, as the instructional designer, he knows best. On the other hand, trainees with no experience in training design are not qualified to assess intricate aspects of instructional design. Negative input from a trainee assigned to training because of performance problems may be suspect. Trainers must be mindful of what type of trainee feedback is valuable and valid.

Summary

The research results support the value of collecting Level 1 data. Since trainee motivation is inextricably linked to Level 1 evaluation data, this relationship leaves little doubt as to whether to attempt Level 1 evaluation because many significant studies link trainee motivation and learning. Dixon's (1987) contention that the validity of Level 1 evaluation is questionable should cause concern. Instruments should be designed to ensure that participants are qualified to make the judgments which they are called upon to make. Furthermore, Tannenbaum et al. (1991) pointed out how the timing of survey application affects the outcome of Level 1 evaluation. They administered their survey within 1 hour of the subjects' arrival at the training site. They proposed that in as short a period as 48 hours, trainees might change their expectations as a result of experiences during that time. From the findings referenced herein, one can easily conclude that Level 1 data must be collected and analyzed with extreme caution. Mathiue et al. (1992) concluded that "participants' reactions to the program played a multifaceted role in linking individual and situational characteristics to other training effectiveness measures. The implications of this finding are that reactions are important for training effectiveness, but not in and of themselves (p 843)." The challenge to trainers is to select, develop, or revise instruments, methodologies, and analysis processes that are appropriate for each training situation.

Level 2 as a Predictor of Level 3

Although many variables must be accounted for and controlled, generally speaking, Level 2 data is more stable than is Level 1. Level 2 evaluation most commonly takes the form of a written or performance-based test to assess learning relatively soon after or during instruction. This process is much more straightforward and susceptible to fewer influences than Level 1. However, Level 3 data collection processes are subject to the same instrumentation problems as Level 1. Consequently, Level 2 to Level 3 correlation is subject to the same problems encountered between Levels 1 and 2.

Clement's (1982) above-referenced study included a correlational analysis of the relationship between Levels 2 and 3 on supervisory training in managing, communicating, and job training for state government supervisors. Pre- and post-test analysis found significant increases in learning on all three skills taught in the course. However, correlational analysis revealed a significant relationship between Level 2 learning and communicating skills only. Once again, methodology and instrumentation played a significant role in the evaluation outcome. The researcher used a subordinate satisfaction survey as the Level 3 measure. Such findings could be widely interpreted. Subordinates' ability to assess their supervisors' performance on the subject skills could easily be called into question in this case. The design of this study illustrates the volatility of survey data. The reliability of evaluation results at any level is subject to the validity of the methodology and instrumentation used to collect data.

Mathieu et al. (1992) found a positive relationship between learning as measured on a written test and post-test behavior measures. On the surface, the Level 2 data in this case would appear to have some predictive capability of Level 3 outcomes. However, the timing of the post-test measure probably influenced the validity of the Level 3 measure. This situation illustrates the need to define each level of evaluation for the purpose of analysis. Post-tests, depending upon the timing of administration, could be qualified as either Level 2 or three. Effective evaluation design calls for a reasonable period of time between training and on-the-job evaluation to effectively measure transfer of training.

In a 6-month follow-up survey, Swierczek and Carmichael (1985) found positive relationships between Levels 2 and 3. They discovered that job performance on the most critical skills was positively related to learning. The weakness in their study was that they surveyed only the participants in the Level 3 process. Supervisors or subordinate surveys may have yielded different results. This study reveals the degree of influence that instrumentation and evaluation methodology have over evaluation outcomes. The goal of the researchers in this case was simply to explore the benefits of using two different types of instrumentation.

Whether or not trainees were able to use the skills taught in the course on the job should be of paramount importance to the trainer. Kelly (1982) based her proposed methodology on the assumption that only 10 percent of a company’s training transfers skills to the job. Although this estimate may be somewhat speculative or exaggerated, it is cause for concern. Level 3 evaluation is critical to program effectiveness. Even if training is successful according to Levels 1 and 2 evaluation outcomes, the training is likely to be of little benefit if such a small percentage of learned skills is transferred to the job. This created the question as to why Level 2 evaluation is conducted and refocuses on the complexities of the evaluation model. The purpose of written measurement often becomes clouded when trainers focus on the course content. Most trainers invest a great deal of effort into ensuring that test items demonstrate content validity, but fall short of demonstrating criterion validity--more specifically predictive validity. This lack of attention to predictive validity is likely due to the difficulty in methodology. Determining the predictive ability of a test requires a correlation of the test results with job performance (Linn & Gronlund 1995). However, even though the processes involved are technically difficult, the research concerning Level 2 data as a predictor of job performance is much less conflicting and less susceptible to criticism than that of trainee reaction.

Level 3 evaluation is the most accurate measure of transfer of training because it occurs on the job. Assessing changes in behavior or performance requires the establishment of a baseline (Kirkpatrick, 1996). The evaluator must have some knowledge of the subjects' ability on the criterion before the training occurred. The process of employee performance evaluation outside the context of training is a difficult one. However, in practice, time constraints, funding, and job site characteristics often preclude effective Level 3 evaluation. Such limitations emphasize the need for Level 2 evaluation that been proven to have predictive ability. If the Level 2 measure can be validated as an accurate predictor of job performance for recurring training programs, the often more expensive and difficult Level 3 measures could be minimized or eliminated. The difficulty in incorporating such data into an already complex instruction design process is clear.

To conduct Level 3 evaluation effectively, trainers must understand that the effectiveness of training transfer is influenced by a number of variables. Clement (1982) found in his study of manager training that, even though learning occurred, trainees did not necessarily improve their management behavior. He attributed this lack of correlation to such influencing variables as organizational policy, supervision, and peer group.

The Composite of Levels 1 and 2 as a Predictor of Level 3

No studies were found that considered the composite of Levels 1 and 2 data. Several employed multiple predictor variables against one dependent variable, but all studies looked at such variables within the same level of evaluation. Mathiue et al. (1992) studied student motivation and reactions composites to predict learning. Tannenbaum et al. (1991) considered trainee fulfillment, along with reactions, to predict Level 3 organizational commitment. Tracey and Tannenbaum (1995) considered several organizational variables as predictors of transfer of training (Level 3). The methodologies used in these studies are similar to those in the current study, but the variables were not comparable for the purpose of determining parallel findings.

Summary

Such diverse conclusions concerning linearity could easily lead to the belief that there is little application for the collective findings of the research literature. However, there is sufficient evidence to suggest that linear relationships among levels of evaluation do exist. These studies substantiate the value of evaluation processes at each level. The ability of data at each level to predict outcomes at subsequent levels is a function of design and methodology as well as the goal of the trainer. The value of any survey data is directly proportional to the validity of the instrumentation used in its collection (Phillips, 1991).

Whether or not there is linearity among the levels in Kirkpatrick's (1996) model is obviously a question of design. Evaluation processes cannot be simplified to the point that a single methodology will apply to all training situations. Evaluation at each level can be accomplished effectively and independently of other levels. However, the evaluator must be mindful that such independent applications of these measures preclude assumptions of linearity. Consequently, the evaluator must determine the purpose of evaluation at each level before selecting methodology and instrumentation.

The current study reinforces the concept that Level 1 evaluation processes must be tailored to the training situation. Standardized instrumentation facilitates data collection on a large aggregate scale, but it devalues the evaluation output when the instrument does not adapt to the trainee population or the course content. Furthermore, Level 2 measures that do not demonstrate predictive validity should be scrutinized for applicability. These measures should be valued and implemented according to their ability to predict Level 3 outcomes and thus preclude the necessity of constant Level 3 measures.

The common element among all the studies reviewed is that each level of evaluation and the complexity and quantity of variables involved in each training situation significantly influence its relationship to other levels. Trainers should methodically account for the influence of such variables as instrumentation, trainee population characteristics, and other organizational variables that may be relevant to the training environment in which they are operating.

The point that must be considered is that trainers should explicitly define the desired outcome and application of Level 1 data before gathering the data and design instrumentation and methodology accordingly. If trainers consume evaluation information from a global perspective and fail to look for a single method to apply to all situations, there is ample opportunity to apply the results of past studies. It cannot be concluded that each level of data has a definitive meaning in all training situations. Just as with any other aspect of the training development and delivery, no one size fits all solutions to evaluation exist.

Haccoun and Hamtiaux (1994) summed up the difficulty facing the corporate trainer in their statement that "those research designs which permit convincing training evaluations can rarely be implemented in organizations, while those designs that are practical for organizations are judged inadequate for evaluation research (594)." All trainers attempting to employ evaluation processes at one time or another have likely felt this paradox. Most training programs fall somewhere behind production requirements in any organization, thus challenging the trainer to fit into the organizational structure while conducting training and at the same time, proving its value.

CHAPTER III

METHODS AND PROCEDURES

Introduction

This chapter provides a description of the procedures employed in collecting and treating the data. This correlational study focuses on the relationships of student reaction and learning, student reaction and job performance, and learning and job performance. It also considers the composite of student reaction and learning as related to job performance. Graduates of five U.S. Air Force technical training courses were the participants of the study.

Research Design

The study involved the correlational analysis among 3 levels of evaluation data. The first correlation was between the predictor variable, student reaction data (Level 1) and the dependent variable, test scores (Level 2). Level 1 was then correlated to the dependent variable job performance (Level 3). In the last correlation, Level 2 served as the predictor variable and Level 3 as the dependent variable. Pearson product moment correlation coefficients were computed to report the findings. Lastly a composite of Levels 1 and 2 data was correlated to Level 3 data using multiple linear regression analysis.

Sample

The study was conducted on U.S. Air Force technical training graduates on whom data existed for the field evaluation. The dates of graduation were between March of 1997 and December of 1998. A total of 192 graduates from five Air Force specialties were included in the initial data set. Four graduates who were rated other than 0 through 4 on the Level 3 measure were eliminated from the data set. Ratings outside this range indicate that the graduate had not performed duties related to the training received. Of the remaining 188 subjects, 34 were from a single course in the aircrew protection specialty area; 12 were from a single course in the munitions and weapons specialty area; and 142 were from three separate courses in the manned aerospace maintenance specialty area. All those included in the study were new recruits for whom the training provides initial skills. The results of the study were reported by course and are considered generalizable to all graduates of the subject courses. The results are considered generalized to similar courses within the same subject area. Prerequisite requirements for courses within the same family grouping are the same.

This study was a database research project, and the sample was not randomly drawn due to the nature of the field evaluation process employed by the Air Force. Graduates from the population on whom field evaluations were conducted in the specified time period were included in the study.

Instrumentation

Data were extracted from an existing evaluation database. The data populating that database are collected using several methods. The instrument used for collection of Level 1 data is a standardized survey comprised of 45 items and administered via computer. The survey employs a 5-point Likert scale, with options ranging from strongly agree to strongly disagree, with neutral as the midpoint. Respondents are also provided a not applicable option. These data are stored in the student evaluation database, which is a Microsoft Access product. Content validity evidence was gathered through panel reviews and small group tryouts on the target population. The instrument has been revised once since being instituted in 1994 and has been in use in its current form since April 1996.

Level 2 data are entered manually into that same database from trainee academic records. The average of trainee performance on all tests administered throughout the course is recorded as Level 2 data. All courses have test points throughout, averaging one test per 40 hours of instruction. Tests are typically comprised of 20 to 50 multiple selection items. All written tests must comply with the specifications and validation process described in AETC Instruction 36-2203, the training command's policy on measurement. Written test items are scrutinized by curriculum and subject matter experts to determine the relevance of each to the training objective. Tests must also meet parallel forms reliability requirements of AETCI 36-2203, which requires a minimum of two versions of each written test at each test point throughout the course. Each test version must be administered three times, and have composite score averages within five percentage point of its alternate.

Level 3 data are collected through surveys mailed to the supervisor of the graduate. Supervisors are asked to rate the graduates' ability to perform tasks for which they were trained in the respective courses. This survey employs a 5-point Likert scale, with options ranging from outstanding to unsatisfactory, with satisfactory being the midpoint. Each supervisor is also asked to provide an overall rating of the graduate. The results of the surveys are scanned, and the resulting data are downloaded into the student evaluation database. Return rates are high in this process because participation is mandatory. A confidence level of no less than 80 percent is required on all surveys, and levels of 90 and above are typical.

Rater reliability has also been accounted for. Errors of leniency and severity as well as the halo effect are concerns in the types of ratings required by supervisors for the Level 3 data in this study (Kerlinger, 1986). Controls are in place to minimize rater error. A standardized Air Force-wide training program for all supervisors includes training on graduate evaluation and the completion of the surveys. Air Force supervisors are required to evaluate all personnel upon assignment to their unit and to develop personalized training plans for each subordinate. Furthermore, the Air Force employs education and training specialists who are assigned to every operational unit. These specialists are responsible for the administration and oversight of FEQ surveys. They provide guidance and training to supervisors on how to assess the competence of the graduates and complete the survey. Appendix C contains a FEQ survey and report from a course that was a subject of this study.

Data Collection Procedures

All the data for this study were extracted from the evaluation database, using the query functions of Microsoft Access and downloaded into SPSS 9.0 for analysis. Individual average responses to items 1 through 20 were used as Level 1 data. These items were chosen because their mean rating is commonly reported to course managers and commanders for use in curriculum and management decisions. Other questions on the instrument concern base support or personal issues and are not directly related to training. Written test scores were used as Level 2 data. These test scores were averaged for an overall course score. Each Level 3 survey included a question concerning overall performance. This question was extracted from the evaluation database and used as Level 3 data.

Restatement of the Hypothesis

Ho_1: There will be no statistically significant relationship between Level 1 and Level 2 evaluation results.

Ho_2: There will be no statistically significant relationship between Level 1 and Level 3 evaluation results.

Ho_3: There will be no statistically significant relationship between Level 2 and Level 3 evaluation results

Ho_4: There will be no statistically significant relationship between the composite of Levels 1 and 2 and Level 3 evaluation results.

Data Analysis Procedures

Hypotheses 1 through 3 were tested using Pearson production moment correlation coefficient. The two variables are paired observations. Each student's reaction score can be compared to his or her written test score, as well as the supervisory rating on the field evaluation. Hypothesis 4 was tested using multiple linear regression. Multiple regression is required to correlate multiple predictor variables to the criterion variable (Kerlinger, 1986, Hinkle et al., 1994). In this case, Levels 1 and 2 variations are the predictor variables and Level 3 the criterion variable.

Summary

A correlational design was selected to determine the relationship between and among the three levels of evaluation. Multiple linear regression was used to correlate composite predictor variables, Levels 1 and 2, to the dependent variable, Level 3. Trainees were from initial skills courses resident at Sheppard Air Force Base, Wichita Falls, Texas. The sample is not random due to limitations of the field evaluation processes used in collection of that data.

CHAPTER IV

DATA ANALYSIS AND RESULTS

Introduction

The purpose of this study was to determine whether or not significant linear relationships existed between and among the levels of Kirkpatrick's (1996) evaluation model when using data from U.S. Air Force technical training evaluation processes. This chapter presents the results of the data analysis procedures and is divided into six sections. The first section provides an overview of the participants of the study. The second section contains a description of the data and the statistical analysis. The next three sections evaluate the hypotheses against the supporting analysis, and the last section provides a summary of the chapter.

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Participants of the Study

The study was conducted on an existing database of Air Force technical training graduates. The database is a relatively new product in Air Force technical training. The study utilized data only from trainees that graduated since the process of collecting and storing Levels 1 and 2 data in computerized database began. All participants for this study graduated between March 1997 and January 1999. A total of 188 graduates from five Air Force specialties were included. Thirty-four cases were from a single course in the aircrew protection specialty area; 12 were from a single course in the munitions and weapons specialty area; and 142 were from three separate courses in the manned aerospace maintenance specialty area.

Data Collection and Statistical Analysis Process

Data were extracted from an existing evaluation database that is collected using several methods. Level 1 data were captured from an automated survey instrument that is administered to trainees before they graduate. These data are stored in the student evaluation database which is a Microsoft Access product. Level 2 data are entered manually into that same database from student academic records. Level 3 data are collected on surveys mailed to the supervisor of the graduate. These surveys are scanned, and the resulting data are downloaded into the student evaluation database. All the data for this study were pulled from the database using query functions and downloaded into SPSS 9.0 for analysis. Pearson product moment correlation coefficients were computed to test hypotheses 1, 2, and 3 for each subject course. These correlation coefficients were computed and reported by course because written tests were used as the Level 2 measure. These tests are unique to each course's subject matter and preclude aggregation of data. The critical alpha level was established at .01 due to the large number of statistical significance tests in order to prevent extreme inflation of type I error rates. For hypothesis 4, a composite of Levels 1 and 2 served as predictor variables and Level 3 as the dependent variable in multiple regression analysis. These data are also reported by course for the reason stated above. Descriptive statistics for each level of data are reported for all courses in Table 2. Correlation coefficients are reported in Tables 3 through 7.

Table 1

Gender Demographics of Participants

COURSE ID		Gender count
J3ABR1T131 002	Female	13
Aircraft Life Support	Male	21
	Total	34
J3ABR2A631B 002	Female	2
Turbo Prop Mechanic	Male	58
	Total	60
J3ABR2A634 001	Female	3
Aircraft Fuel Systems	Male	61
	Total	64
J3ABR2A635 000	Female	0
Aircraft Pneudraulic Systems	Male	18
	Total	18
J3ABR2W131F 004	Female	0
Aircraft Armament Systems	Male	12
	Total	12
Gender Totals	Male	18
	Female	170
Grand Total		188

Table 2

Descriptive Statistics for All Course Measures

COURSE ID		Mean	Std. deviation	N
J3ABR1T131 002	Level 1	4.126	.399	34
Aircraft Life Support	Level 2	90.47	3.74	34
	Level 3	2.912	1.083	34
J3ABR2A631B 002	Level 1	3.985	.381	60
Turbo Prop Mechanic	Level 2	90.42	4.59	60
	Level 3	2.200	.879	60
J3ABR2A634 001	Level 1	4.188	.365	64
Aircraft Fuel Systems	Level 2	89.19	4.74	64
	Level 3	2.359	.784	64
J3ABR2A635 000	Level 1	4.122	.286	18
Aircraft Pneudraulic Systems	Level 2	92.17	4.29	18
	Level 3	2.778	.732	18
J3ABR2W131F 004	Level 1	4.317	.359	12
Aircraft Armament Systems	Level 2	85.08	4.70	12
	Level 3	2.917	.669	12

Table 3

Correlation Coefficients for Course J3ABR1T131 002

COURSE ID			Level 1	Level 2	Level 3
J3ABR1T131 002	Level 1	Pearson correlation	1.000	-.181	.006
Aircraft Life Support		Sig. (1-tailed)		.153	.488
		N	34	34	34
	Level 2	Pearson correlation	-.181	1.000	.003
		Sig. (1-tailed)	.153		.493
		N	34	34	34
	Level 3	Pearson correlation	.006	.003	1.000
		Sig. (1-tailed)	.488	.493	
		N	34	34	34

Table 4

Correlation Coefficients for Course J3ABR2A631B 002

COURSE ID			Level 1	Level 2	Level 3
J3ABR2A631B 002	Level 1	Pearson correlation	1.000	.078	-.132
Turbo Prop Mechanic		Sig. (1-tailed)		.276	.156
		N	60	60	60
	Level 2	Pearson correlation	.078	1.000	-.013
		Sig. (1-tailed)	.276		.462
		N	60	60	60
	Level 3	Pearson correlation	-.132	-.013	1.000
		Sig. (1-tailed)	.156	.462	
		N	60	60	60

Table 5

Correlation Coefficients for Course J3ABR2A634 001

COURSE ID			Level 1	Level 2	Level 3
J3ABR2A634 001	Level 1	Pearson correlation	1.000	.248	-.156
Aircraft Fuel Systems		Sig. (1-tailed)		.024	.109
		N	64	64	64
	Level 2	Pearson correlation	.248	1.000	.208
		Sig. (1-tailed)	.024		.050
		N	64	64	64
	Level 3	Pearson correlation	-.156	.208	1.000
		Sig. (1-tailed)	.109	.050	
		N	64	64	64

Table 6

Correlation Coefficients for Course J3ABR2A635 000

COURSE ID			Level 1	Level 2	Level 3
J3ABR2A635 000	Level 1	Pearson correlation	1.000	-.262	.025
Aircraft Pneudraulic Systems		Sig. (1-tailed)		.147	.461
		N	18	18	18
	Level 2	Pearson correlation	-.262	1.000	.125
		Sig. (1-tailed)	.147		.311
		N	18	18	18
	Level 3	Pearson correlation	.025	.125	1.000
		Sig. (1-tailed)	.461	.311	
		N	18	18	18

Table 7

Correlation Coefficients for Course J3ABR2W131F 004

COURSE ID			Level 1	Level 2	Level 3
J3ABR2W131F 004	Level 1	Pearson correlation	1.000	.123	.385
Aircraft Armament		Sig. (1-tailed)		.352	.108
		N	12	12	12
	Level 2	Pearson correlation	.123	1.000	.321
		Sig. (1-tailed)	.352		.155
		N	12	12	12
	Level 3	Pearson correlation	.385	.321	1.000
		Sig. (1-tailed)	.108	.155	
		N	12	12	12

Findings of Level 1 as a Predictor of Levels 2 and 3

Ho$_1$: There will be no statistically significant relationship between Level 1 and Level 2 evaluation results at the .01 level of significance.

No significant coefficients were found between Levels 1 and 2 in any courses. Therefore, Therefore, the null is retained for this hypothesis statement on all courses.

Ho$_2$: There will be no statistically significant relationship between Level 1 and Level 3 evaluation results at the .01 level of significance.

There were no statistically significant coefficients found between levels 1 and 3 in any courses. Therefore, the null is retained for this hypothesis statement on all courses.

Findings of Level 2 as a Predictor of Level 3

Ho_3: There will be no statistically significant relationship between Level 2 and Level 3 evaluation results at the .01 level of significance.

No statistically significant coefficients were found between Levels 2 and 3 for any courses. Therefore, the null is retained for this hypothesis statement on all courses.

The Findings of the Composite of Levels 1and 2 as a Predictor of Level 3

The model summary for the multiple linear regression results is shown in Table 9. The results of the multiple linear regression analysis ANOVA for hypothesis four is reported in Table 10.

Table 8

Model Summary for Multiple Linear Regression

COURSEID	n	R	R square	Adjusted R square	Std. Error of the estimate
J3ABR1T131 002					
Aircraft Life Support	34	.007[a]	.000	-.064	1.118
J3ABR2A631B 002					
Turbo Prop Mechanic	60	.133[a]	.018	-.017	.887
J3ABR2A634 001					
Aircraft Fuel Systems	64	.298[a]	.089	.059	.761
J3ABR2A635 000					
Aircraft Pneudraulic Systems	18	.139[a]	.019	-.112	.772
J3ABR2W131F 004					
Aircraft Armament Systems	12	.474[a]	.224	.052	.651

a. Predictors: (Constant), Level 2, Level 1.
a. Dependent Variable: Level 3.

Table 9

Summary of ANOVA for Multiple Linear Regression

a. Dependent Variable: Level 3

COURSEID	Model		Sum of square	Df	Mean square	F	Sig.
J3ABR1T131 002	1	Regression	.002	2	.001	.001	.999[a]
Aircraft Life Support		Residual	38.733	31	1.249		
		Total	38.735	33			
J3ABR2A631B 002	1	Regression	.801	2	.400	.509	.604[a]
Turbo Prop Mechanic		Residual	44.799	57	.786		
		Total	45.600	59			
J3ABR2A634 001	1	Regression	3.445	2	1.723	2.978	.058[a]
Aircraft Fuel Systems		Residual	35.289	61	.579		
		Total	38.734	63			
J3ABR2A635 000	1	Regression	.175	2	.087	.147	.865[a]
Aircraft Pneudraulic Systems		Residual	8.936	15	.596		
		Total	9.111	17			
J3ABR2W131F 004	1	Regression	1.102	2	.551	1.301	.319[a]
Aircraft Armament Systems		Residual	3.814	9	.424		
		Total	4.917	11			

a. Predictors: (Constant), Level 2, Level 1.
b. Dependent Variable: Level 3.

Ho4: There will be no statistically significant relationship between the composite of Levels 1 and 2 and Level 3 evaluation results at the 01 level of significance.

There were no statistically significant multiple R statistics for any courses when the composite of levels one and two served as predictor variables and Level 3 was the dependent variable. The statistical significance levels in table 10 are all greater than .05

and therefore the results are not statistically significant at the .01 level. Therefore, the null is retained for this hypothesis statement on all courses.

Summary

The findings of the current study are consistent with those of previous studies. The results of evaluation processes at lower levels do not consistently predict evaluation outcomes at subsequently higher levels.

CHAPTER V

CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Introduction

The current study investigated the relationships among the various levels of one of the most widely used evaluation models in the training discipline. The study consisted of two statistical procedures: computing correlation coefficients and multiple linear regression. Both methods were used to determine whether or not lower levels of evaluation could predict the outcome of evaluation at subsequently higher levels. Included here are a discussion of the findings of the study, a discussion of the implications and recommendations for improving evaluation methods in Air Force technical training, recommendations for further study, and a concluding statement.

Findings of Level 1as a Predictor of Levels 2 and 3

The results of the current study provided no evidence that Level 1 data can be used to predict evaluation outcomes at subsequently higher levels in the Air Force evaluation process. None of the five courses studied, produced a statistically significantly coefficient between Levels 1 and 2. The means and standard deviations for each level of evaluation were similar across all courses.

These findings may be attributed to the characteristics of the target population of the courses studied. All courses provided initial skills training to new recruits who are not likely qualified to assess certain aspects of training as required by the instrument. Eight of the 20 items on the Level 1 instrument require the trainee to assess instruction, curriculum, or measurement. Dixon (1987) warned that trainees should not be called upon to evaluate quality of training. The section of the survey that clearly demonstrates this point is the one concerning measurement. To further explore this theory, item 19 of the survey was isolated for analysis and found to be significantly correlated to the Level 2 measure in two of the five courses. The correlation for the turbo prop course was .341 and significant at .004 level. The correlation for the fuel systems course was .383 and significant at .001 level. These findings indicate that the trainees are not qualified to assess their own subject knowledge. Those who scored low on the tests indicated that the tests were not accurate representation of their knowledge of the subject matter. High scorers indicated the opposite. Furthermore, there was no correlation between item 19 and the Level 3 measure indicating that the trainees' opinions concerning their tests scores were not substantiated by their supervisors. Any such an item on a survey is likely to be subjectively rated by trainees.

There were no significant correlation coefficients found for any course between Level 1and Level 3 in any course. This lack of correlation may also be attributed to the target population who are not likely qualified to assess quality of training as related to the job for which they are being prepared. To further explore the relationship between Levels 1 and 3 (Ho_2), the data were analyzed in aggregate form. These data are reported in Table 10. The aggregation is appropriate because the instrumentation for Levels 1 and 3 are the same for all subjects in all courses. There was no significant coefficient in this correlation. The aggregate of these data reinforces the inability of Level 1 data to predict job performance on the subject courses.

Table 10

Aggregate Correlation Coefficients for all Courses – Level 1 to Level 3

		Level 1	Level 3
Level 1	Pearson correlation	1.000	-.021
	Sig. (1-tailed)		.386
	N	188	188

The overall findings revealed the need to consider variables that could potentially influence trainee reaction in the training evaluation processes. The process of isolating a specific variable to determine its relationship to other variables is both valuable and necessary. Because these variables are different for each training situation, the evaluator must carefully select those which are to be considered based on their relevance to training goals. Findings by Mathieu et al. (1992) support the need for consideration of other variables. They were able to produce more practical and applicable results by excluding or including specific variables in the correlational process. Information concerning student volunteer status (whether they selected the career field in which they are trained), student aptitude scores, guard or reserve status, and retraining status is essential to understanding the results of evaluation processes.

Further exploration was conducted using additional items from the survey that were not included in the original analysis. Item 21 of the survey asks the trainees to rate their satisfaction with their career field. This item was selected for correlation due to its apparent potential to influence trainees' satisfaction with training. Baldwin et al. (1991) found positive relationships between trainee satisfaction and whether they chose or had been assigned to training. In some cases, Air Force enlistees are given a choice of career fields. Correlational analysis of this item to Levels 2 and 3 revealed no significant coefficients in either case. Although there was no way to determine which subjects in the current study volunteered for their career field assignments, this lack of correlation indicates that volunteer status had no influence on the correlation of Level 1 to Levels 2 and 3.

Item 29 of the Level 1 instrument was also correlated to Levels 2 and 3. This item asks the trainees to rate whether their self-image has improved since entering training. Tannenbaum et al. (1991) studied the effects of trainee self-efficacy on reactions and learning and found self-efficacy, which is related to self-image, to be highly influential in Level 3 evaluation. Correlational analysis of item 29 to Levels 2 and 3 indicated no significant coefficients in either case. This lack of correlation could be likely attributed to the ambiguity of the item. Tannenbaum et al. Asked specific questions regarding academic and physical achievement and more importantly, employed pre- and post-test methodology. The instrumentation of the current study is likely too simplistic in its design to yield valid results.

The lack of significant correlation coefficients Level 1 and subsequent levels of evaluation is not necessarily cause for alarm. The intent of the current study was to simply determine if such a correlation existed, not to establish the value of Level 1 data on the basis of such a relationship. The current study indicated that that the student feedback instrument used in Air Force technical training lacks the ability to predict learning and job performance. Refinement of the instrument is likely necessary to improve its utility and facilitate informed decision making regarding its application.

Trainers should also bee keenly aware of how trainees' perceptions of one aspect of training may affect their perceptions of other aspects. For instance, if the facility in which training is conducted is physically uncomfortable, or does not foster a positive atmosphere, trainee ratings of other elements of the training may be adversely affected. Conversely, in cases where the instructor is traditionally well liked or has a reputation of competence, the trainees may more readily forgive shortcomings in facilities, instructional aids, and curriculum. Most managers of training can predict which instructors will consistently be rated high by trainees, regardless of other factors.

The obvious question at this point is "what is to be gained from Level 1 data?" Trainees' opinions can be a valuable source of input, if the correct information is solicited from them. Although, there are scientific methods by which trainers can assess the effectiveness of instructional materials, aids, and curriculum, there is a lot to gained by asking the trainee how well these aspects facilitated their achievement of the instructional objectives. Furthermore, just as managers should not assume that high ratings of instructors is no guarantee that learning is occurring, consistently low ratings of instructors by trainees might indicate some investigation is needed. Although trainees are not normally versed in effective instructional techniques, they can tell when the instructional environment is not conducive to learning. As with any data used in decision making, student feedback should never be considered in isolation.

Findings of Level 2 a Predictor of Level 3

The ability of Level 2 data to predict job performance is a function of the predictive validity of the written tests. The current study indicated no significant correlation between Levels 2 and 3. Lack of correlation between written tests and job performance should prompt managers to assess the validity of using such test results as criteria for progression through the course and graduation. The lack of consistency in policy concerning test analysis may contribute to this problem. Much is left to lower organizational levels concerning to what degree test analysis is conducted. The higher level policy governing test analysis is focused more on reliability measures than on validity. A stringent validation process for written tests is needed to ensure validity of written test results.

Although the lack of a positive correlation between Levels 2 and 3 should be investigated, it does not necessarily indicate that Level 2 measures are ineffective, or that job performance is suffering. Clement (1982) suggested that trainers should consider the background from which the students came, as well as the work environment in which they will be applying learned skills. One of the strongest recruiting tools of the Air Force is its reputation for quality technical training. Most enlistees are hoping to gain skills that are considered valuable in the job market. Since the typical recruits are interested in vocational training as opposed to college, it might be safe to assume that they are less inclined to be interested in the academic component of the training. Based on that perspective, lack of a relationship between performance on written tests and performance on the job in skills, that are primarily psychomotor in nature, should come as no surprise. Trainers should not assume that written tests are always the best measure of learning. There are cases where written measurement may not be appropriate, and other measures, such as performance evaluation during training, should be employed more frequently.

Findings of the Composite of Levels 1 and 2 As a Predictor of Level 3

The current study found no evidence that the composite of the first two levels is a more reliable predictor than data from the individual levels. Because more variables can be considered in one calculation, composite scores have potential to serve as more accurate predictors; however the evaluator must have extensive knowledge of the trainees and all variables in order to determine which variables to include in the composite. The relatively low number of courses over which Level 3 data had been collected limits the generalizability of the results of the current study.

Recommendations for Future Studies

Each level of evaluation data is currently analyzed in isolation from other levels. Level 1 data is collected and reported on all courses, but is never compared to written test scores. Of the five courses included in the study, the highest positive correlation coefficient between Levels 1 and 2 was .248, with a significance level of .024. There were no cases of significant correlation between Levels 1 and 3. Such an absence of correlation of Level 1 to Levels 2 and 3 should certainly lead managers to investigate the value of Level 1 data and establish processes for its application. Processes must be in place to guide the consumption of such data in order to benefit from its true meaning. At the same time overreacting to student dissatisfaction must be avoided. Dixon (1987) proposed that soliciting student feedback predisposes trainers to focus on pursuing high satisfaction rates at the expense of training effectiveness.

More correlational analysis is needed to increase confidence in the findings of the current study. Subsequent research should also focus on the development of methodologies for the collection and analysis of Level 1 evaluation data for practical application. Lower levels of evaluation need not necessarily predict the outcomes of subsequent higher levels to be of value. The importance of trainee motivation and learning environment has been adequately demonstrated in previous studies. Tannenbaum and Yukl (1992) concluded that trainee motivation is essential to the transfer of learning to the job. On the basis of this theory, trainers would benefit from knowing what aspects of their training programs affected trainee motivation.

Air Force trainers tend to value written test results as indicators of training program success. Yet the current study found no relationship between the results of such written measures and job performance ratings. Given the predominance of psychomotor skills training within the Air Force, more attention should be focused on the use of performance-based assessment.

Air Force trainers must have dependable evaluation processes that yield consistent results. Either lower level evaluation processes must be made more dependable or more frequent higher level evaluation must be conducted. The limitations of the current study imposed by limited availability of Level 3 data exist due to the labor-intensive process involved in collecting such data. More reliable processes at lower evaluation levels may serve to reduce the requirement for more complex and expensive processes at higher levels. Level 3 data must be available to establish and periodically revalidate evaluation. Computer technology should be considered as an avenue to reduce this limitation.

Concluding Statement

The need for improved evaluation processes is paramount to Air Force trainers' ability to keep pace with the rapidly changing needs of the operational commands. The improvement of instrumentation and methodologies must be concurrent with continuing studies to facilitate the pace at which evaluation methods must change. Evaluators must identify all variables that may influence training and design or adapt evaluation processes accordingly. Any training evaluation model that could account for all variables would likely be so sophisticated in its design that the average trainer would not have the necessary skills to apply it. To preclude the need for such a model, trainers can conduct more effective evaluation by planning the evaluation process in concert with the instructional design and delivery process.

APPENDIX A

STUDENT SURVEY QUESTIONNAIRE AND SAMPLE REPORT

82D TRAINING GROUP
STUDENT FEEDBACK SURVEY

1 April 1996

This questionnaire asks for your impressions of the overall training, training environment, training facilities, Military Training Flight, base support functions, and the quality of instruction. Use the scale provided to indicate your rating of these areas and mark it on the answer sheet provided (AETC Form 1200).

IF A STATEMENT DOES NOT APPLY LEAVE IT BLANK

ALL STUDENTS ANSWER QUESTIONS 1 THROUGH 28

OVERALL COURSE RATING

1. **My overall rating of the training received is**
   A. Outstanding B. Excellent C. Satisfactory D. Marginal E. Unsatisfactory

A	B	C	D	E
Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**

TRAINING/INSTRUCTION

2. The classroom environment (lighting, furniture, equipment) was satisfactory for learning.
3. Break schedules and break times were appropriate.
4. Safety procedures were stressed and followed.
5. I practiced new skills or applied new information shortly after it was taught.
6. The course study guides/workbooks were well written.
7. This course was interesting and motivating.
8. Instructors presented information in a manner I could understand.
9. Instructors used training aids in an effective manner.
10. Instructors maintained control of the class.
11. Special Individual Assistance (SIA) was effective, if used.
12. Equipment (simulators, trainers, etc.) was available for use and in good operating condition.
13. Technical publications/instructions were satisfactory.
14. The Student Feedback Program met my needs.

MEASUREMENT

15. Tests and progress exercises were administered at appropriate points in the course.
16. Test questions were understandable.
17. My success during progress exercises reflects the knowledge and skills I learned.
18. Instructor feedback was adequate for written tests and progress checks.
19. My written test scores are a realistic reflection of my course knowledge.
20. The written tests were a realistic sampling of the most important points in the course.

Supersedes 1 March 1994

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

<u>GENERAL</u>
IF A STATEMENT DOES NOT APPLY LEAVE IT BLANK

21. I am satisfied with my career field.
22. Medical personnel at the hospital were professional.
23. Finance personnel were professional.
24. Base facilities (gym, theater, library, etc.) were satisfactory.
25. Dining hall facilities were satisfactory (cleanliness, lighting, heat/air).
26. The dining hall food was satisfactory.
27. Base Chapel programs met my needs.
28. The classroom climate was conducive for learning.

<u>ONLY</u> NPS STUDENTS ANSWER QUESTIONS 29 - 37
IF A STATEMENT DOES NOT APPLY LEAVE IT BLANK

29. My self image has improved since entering training at Sheppard.
30. Squadron policies and procedures were clearly explained.
31. Military Training Managers (MTMs) were consistent in their enforcement of standards.
32. Student Leaders (Ropes) were fair.
33. Unit Personnel Office functions were adequately briefed.
34. I was informed about Special Activities Teams and the Student Leader Program.
35. The squadron dormitory area was sufficiently quiet to allow study and sleep.
36. Sufficient time to study was provided outside the classroom environment.
37. I had sufficient time to eat lunch.

<u>ONLY</u> TDY PERSONNEL ANSWER QUESTIONS 38 - 45
IF A STATEMENT DOES NOT APPLY LEAVE IT BLANK

38. Billeting front desk personnel were professional.
39. The billeting reservation system was adequate.
40. Billeting facilities were sufficient. (Cleanliness, lighting, heat/air, noise level, laundry, telephone, etc.)
41. Class information, such as buildjng/room number, class start time, etc., was available in the billeting area.
42. Open Mess personnel were professional.
43. Open Mess facilities were satisfactory. (Cleanliness, lighting, heat/air)
44. The content of this course met my needs.
45. The level of proficiency in this course met my needs.

TRAINING QUALITY ASSESSMENT

STUDENT FEEDBACK QUESTIONNAIRE

J3ALR3S231 002 Class 990504 Graduation Date: 990623

	Total #	# Not	% Not	%	Outstanding	Excellent	Satisfactory	Marginal	Unsat	
OVERALL	Responded	Satisfied	Satisfied	Satisfied						Mean
1 My overall rating of the training received is	14	0	0.0%	64.3%	14.3%	50.0%	35.7%	0.0%	0.0%	3.79
	14	0	0.0%	64.3%	14.3%	50.0%	35.7%	0.0%	0.0%	3.79
	Total #	# Not	% Not	%	Strongly	%	%	%	Strongly	
TRAINING/INSTRUCTION	Responded	Satisfied	Satisfied	Satisfied	Agree	Agree	Neutral	Disagree	Disagree	Mean
2 The classroom environment (lighting, furniture, eq	13	8	61.5%	15.4%	7.7%	7.7%	23.1%	23.1%	38.5%	2.23
3 Break schedules and break times were appropriate	14	4	28.6%	42.9%	7.1%	35.7%	28.6%	28.6%	0.0%	3.21
4 Safety procedures were stressed and followed.	14	0	0.0%	78.6%	7.1%	71.4%	21.4%	0.0%	0.0%	3.86
5 I practiced new skills or applied new information :	14	0	0.0%	85.7%	14.3%	71.4%	14.3%	0.0%	0.0%	4.00
6 The course study guides/workbooks were satisfact	1	0	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	3.00
7 This course was interesting and motivating.	13	0	0.0%	76.9%	0.0%	76.9%	23.1%	0.0%	0.0%	3.77
8 Instructors presented information in a manner I co	14	0	0.0%	92.9%	7.1%	85.7%	7.1%	0.0%	0.0%	4.00
9 Instructors used training aids in an effective mann	14	0	0.0%	100.0%	21.4%	78.6%	0.0%	0.0%	0.0%	4.21
10 Instructors maintained control of the class.	14	0	0.0%	100.0%	42.9%	57.1%	0.0%	0.0%	0.0%	4.43
11 Special Individual Assistance (SIA) was effective,	3	0	0.0%	66.7%	33.3%	33.3%	33.3%	0.0%	0.0%	4.00
12 Equipment (simulators, trainers, etc.) was availabl	13	4	30.8%	53.8%	15.4%	38.5%	15.4%	15.4%	15.4%	3.23
13 Technical publications/instructions were adequate.	14	1	7.1%	85.7%	21.4%	64.3%	7.1%	7.1%	0.0%	4.00
14 The Student Feedback Program was adequate.	14	0	0.0%	85.7%	14.3%	71.4%	14.3%	0.0%	0.0%	4.00
	155	17	11.0%	74.2%	14.8%	59.4%	14.8%	6.5%	4.5%	3.74
	Total #	# Not	% Not	%	Strongly	%	%	%	Strongly	
MEASUREMENT	Responded	Satisfied	Satisfied	Satisfied	Agree	Agree	Neutral	Disagree	Disagree	Mean
15 Tests and progress exercises were administered at	14	0	0.0%	92.9%	14.3%	78.6%	7.1%	0.0%	0.0%	4.07
16 Test questions were understandable.	14	0	0.0%	78.6%	14.3%	64.3%	21.4%	0.0%	0.0%	3.93
17 My success during progress exercises reflects the l	14	0	0.0%	78.6%	21.4%	57.1%	21.4%	0.0%	0.0%	4.00
18 Instructor feedback was adequate for written tests	14	1	7.1%	92.9%	28.6%	64.3%	0.0%	7.1%	0.0%	4.14
19 My written test scores are a realistic reflection of r	14	0	0.0%	71.4%	14.3%	57.1%	28.6%	0.0%	0.0%	3.86
20 The written tests were a realistic sampling of the n	14	0	0.0%	71.4%	21.4%	50.0%	28.6%	0.0%	0.0%	3.93
	84	1	1.2%	81.0%	19.0%	61.9%	17.9%	1.2%	0.0%	3.99
	Total #	# Not	% Not	%	Strongly	%	%	%	Strongly	
GENERAL	Responded	Satisfied	Satisfied	Satisfied	Agree	Agree	Neutral	Disagree	Disagree	Mean
21 I am satisfied with my career field.	14	0	0.0%	92.9%	28.6%	64.3%	7.1%	0.0%	0.0%	4.21
22 Medical personnel at the hospital were professiona	5	3	60.0%	0.0%	0.0%	0.0%	40.0%	40.0%	20.0%	2.20
23 Finance personnel were professional.	5	0	0.0%	100.0%	20.0%	80.0%	0.0%	0.0%	0.0%	4.20
24 Base facilities (gym, theater, library, etc.) were sat	9	3	33.3%	33.3%	0.0%	33.3%	33.3%	33.3%	0.0%	3.00
25 Dining hall facilities were satisfactory. (cleanlines	12	2	16.7%	58.3%	0.0%	58.3%	25.0%	16.7%	0.0%	3.42
26 The dining hall food was satisfactory.	12	0	0.0%	58.3%	8.3%	50.0%	41.7%	0.0%	0.0%	3.67
27 Base Chapel programs met my needs.	4	0	0.0%	50.0%	25.0%	25.0%	50.0%	0.0%	0.0%	3.75
28 The classroom temperature and ventilation were sa	14	12	85.7%	7.1%	7.1%	0.0%	7.1%	21.4%	64.3%	1.64
	75	20	26.7%	50.7%	10.7%	40.0%	22.7%	13.3%	13.3%	3.21
	Total #	# Not	% Not	%	Strongly	%	%	%	Strongly	
NPS STUDENTS	Responded	Satisfied	Satisfied	Satisfied	Agree	Agree	Neutral	Disagree	Disagree	Mean
29 My self image has improved since entering trainin	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
30 Squadron policies and procedures were clearly exp	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
31 Military Training Managers (MTMs) were consist	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
32 Student Leaders (Ropes) were fair.	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
33 Unit Personnel Office functions were adequately b	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
34 I was informed about Special Activities Teams an	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
35 The squadron dormitory area was sufficiently quie	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
36 Sufficient time to study was provided outside the c	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
37 I had sufficient time to eat lunch.	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
	Total #	# Not	% Not	%	Strongly	%	%	%	Strongly	
TDY PERSONNEL	Responded	Satisfied	Satisfied	Satisfied	Agree	Agree	Neutral	Disagree	Disagree	Mean
38 Billeting front desk personnel were professional.	14	1	7.1%	71.4%	14.3%	57.1%	21.4%	0.0%	7.1%	3.71
39 The billeting reservation system was adequate.	14	1	7.1%	71.4%	0.0%	71.4%	21.4%	7.1%	0.0%	3.64
40 Billeting facilities were sufficient. (Cleanliness, li	14	7	50.0%	42.9%	7.1%	35.7%	7.1%	14.3%	35.7%	2.64
41 Class information such as building/room number,	14	2	14.3%	57.1%	7.1%	50.0%	28.6%	14.3%	0.0%	3.50
42 Open Mess personnel were professional.	10	0	0.0%	80.0%	10.0%	70.0%	20.0%	0.0%	0.0%	3.90
43 Open Mess facilities were satisfactory. (Cleanline	10	0	0.0%	80.0%	10.0%	70.0%	20.0%	0.0%	0.0%	3.90
44 The content of this course met my needs.	14	0	0.0%	85.7%	14.3%	71.4%	14.3%	0.0%	0.0%	4.00
45 The level of proficiency in this course met my nee	14	0	0.0%	85.7%	14.3%	71.4%	14.3%	0.0%	0.0%	4.00
	104	11	10.6%	71.2%	9.6%	61.5%	18.3%	4.8%	5.8%	3.64
AVERAGES	432	49	11.3%	70.4%	13.7%	56.7%	18.3%	6.0%	5.3%	3.67

APPENDIX B

CAREER FIELD TRAINING STANDARD EXAMPLE

PROFICIENCY CODE KEY 2A6X4

This Block Is For Identification Purposes Only		
Name Of Trainee Printed Name (*Last, First, Middle Initial*)	Initials (Written)	SSAN

Printed Name Of Training/Certifying Official And Written Initials	
N/I	N/I
N/I	N/I
N/I	N/I
N/I	N/I
N/I	N/I
N/I	N/I
N/I	N/I
N/I	N/I

QUALITATIVE REQUIREMENTS

Proficiency Code Key		
	Scale Value	Definition: The individual
Task Performance Levels	1	**IS EXTREMELY LIMITED** (Can do simple parts of the task. Needs to be told or shown how to do most of the task.)
	2	**IS PARTIALLY PROFICIENT** (Can do most parts of the task. Needs only help on hardest parts.)
	3	**IS COMPETENT** (Can do all parts of the task. Needs only a spot check of completed work.)
	4	**IS HIGHLY PROFICIENT** (Can do the complete task quickly and accurately. Can tell or show others how to do the task.)
*Task Knowledge Levels	a	**KNOWS NOMENCLATURE** (Can name parts, tools, and simple facts about the task.)
	b	**KNOWS PROCEDURES** (Can determine step by step procedures for doing the task.)
	c	**KNOWS OPERATING PRINCIPLES** (Can identify why and when the task must be done and why each step is needed.)
	d	**KNOWS ADVANCED THEORY** (Can predict, isolate, and resolve problems about the task.)
**Subject Knowledge Levels	A	**KNOWS FACTS** (Can identify basic facts and terms about the subject.)
	B	**KNOWS PRINCIPLES** (Can identify relationship of basic facts and state general principles about the subject.)
	C	**KNOWS ANALYSIS** (Can analyze facts and principles and draw conclusions about the subject.)
	D	**KNOWS EVALUATION** (Can evaluate conditions and make proper decisions about the subject.)

Explanations

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Example: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

\- This mark is used alone instead of a scale value to show that no proficiency training is provided in the courses or CDC's.

/ This mark is used in course columns to show that training is required but not given due to limitations in resources (3c/b, 2b/b etc.).

Specialty Training Standard

2A6X4

1. Tasks, Knowledge And Technical References	2. Core Tasks 5	2. Core Tasks 7	3. Certification For OJT A Trng Start	3. B Trng Comp	3. C Trainee Initials	3. D Trainer Initials	3. E Certifier Initials	4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1) A 3 Skill Level Course	4. B CDC 5	4. B CDC 7	4. C 7 Skill Level Course
NOTE 1: Users are responsible for annotating training references to identify current references pending STS revision.											
NOTE 2: All tasks and knowledge identified as training requirements in column 4A will be taught during wartime. The 7-level course is not taught during wartime.											
NOTE 3: Items in column 2 marked with an asterisk (*) identify core tasks. Core tasks identified with */R are optional for ANG and AFRC.											
A2.1. AIRCRAFT FUEL SYSTEMS CAREER LADDER PROGRESSION TR: AFMAN 36-2108; AFVA 39-1								-	A	-	-
A2.2. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM											
A2.2.1. Principles of ground safety TR: AFMAN 91-201; AFI 91-202; AFOSH Stds 127-22, 127-66 and 91-100								B	B	-	-
A2.2.2. Practice safety precautions while working in a functioning radar/NDI/fuel/noise/toxic/ hydrazine maintenance area TR: AFIs 91-101 and 32-2001; AFOSH Stds 127-66 and 91-100								-	-	-	-
A2.2.3. Ground and bond aircraft and equipment TR: TOs 00-25-172 and 1-1-3	*							2b	b	-	-
A2.2.4. Practice housekeeping consistent with safety of personnel and equipment TR: AFI 21-101; AFOSH Stds 127-22, 127-56, 127-66, and 91-100								2b	b	-	-
A2.2.5. Apply safety precautions when using tools and test equipment TR: TOs 1-1-3 and 32-1-101	*							3c	b	-	-
A2.2.6. Apply precautions for handling chemicals TR: TOs 1-1-3, 42B-1-1; AFOSH Std 127-43	*							3b	b	-	-
A2.2.7. Apply precautions for handling fuels and hydrazine								b	b	-	-
A2.2.8. Selection and use of personnel restraint harnesses								B	-	-	-
A2.2.9. Contain fuel spills TR: TOs 1-1-3, 42B-1-1; AFOSH Std 127-43	*							b	b	-	-
A2.2.10. Use and maintain personal protective equipment TR: AFOSH Stds 48-1 and 127-31	*							3c	b	-	-
A2.2.11. Develop standards for the use and maintenance of personal protective equipment								-	-	-	2c
A2.2.12. Apply precautions for handling compressed gases TR: TO 42B5-1-2								b	b	-	-
A2.2.13. Foreign object damage prevention program TR: AFI 21-101								B	B	-	-

Specialty Training Standard 2A6X4

1. Tasks, Knowledge And Technical References		2. Core Tasks 5	2. Core Tasks 7	3. Certification For OJT A Tng Start	B Tng Comp	C Trainee Initials	D Trainer Initials	E Certifier Initials	4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1) A 3 Skill Level Course	B CDC 5	B CDC 7	C 7 Skill Level Course
A2.2.14.	Federal Hazard Communication Program TR: AFOSH Std 161-21								A	-	-	-
A2.2.15.	Apply precautions when towing AGE equipment								-	-	-	-
A2.3.	**TECHNICAL PUBLICATIONS**											
A2.3.1.	Fundamentals of TO system TR: AFPD 21-3; TOs 00-5-1 and 00-5-2								B	B	-	-
A2.3.2.	Use technical publications TR: TO 00-5-1, 00-20 series and applicable TOs	*							2b	B	-	2c
A2.3.3.	Use AFTO Form 22, Technical Order Improvement Report And Reply TR: TO 00-5-1								-	-	-	-
A2.4.	**HAZARDOUS MATERIALS AND WASTE HANDLING ACCORDING TO ENVIRONMENTAL STANDARDS TR: AFOSH Std 161-21**											
A2.4.1.	Types of hazardous materials/fluids								B	-	-	C
A2.4.2.	Handling procedures								B	-	-	C
A2.4.3.	Storage and labeling								B	-	-	C
A2.4.4.	Proper disposal								B	-	-	C
A2.5.	**MAINTENANCE MANAGEMENT TR: AFI 21-109 and applicable Command Directives**											
A2.5.1.	Organizational structure of the Logistics/Operations Group TR: AFI 38-101								A	B	-	-
A2.5.2.	Operations/Logistics Group Commander Responsibilities								-	-	-	B
A2.5.3.	Logistics Maintenance Management								-	-	-	
A2.5.4.	Maintenance Accountability								-	-	-	-
A2.5.5.	Operational Risk Management								-	-	-	-
A2.5.6.	Compliance and Standardization Requirements Checklist								-	-	-	-
A2.5.7.	Resource Management								-	-	-	-
A2.5.8.	PEWG, TIPWG, STP and PMR								-	-	-	-
A2.5.9.	Financial Plan								-	-	-	-
A2.5.10.	Aircraft Maintenance Management Information Systems								-	-	-	-
A2.5.11.	Aircraft Monitoring								-	-	-	-
A2.5.12.	Maintenance QPM Relationships								-	-	-	-
A2.5.13.	Mobility								-	-	-	-

Specialty Training Standard

2A6X4

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
			A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
	5	7	Tng Start	Tng Comp	Trainee Initials	Trainer Initials	Certifier Initials	Course	5	7	Course
A2.5.14. Expediter, Production Supervisor, and Flight Chief Duties and Responsibilities								-	-	-	-
A2.5.15. Maintenance Incident Investigation and Prevention								-	-	-	-
A2.5.16. Maintenance categories and levels TR: AFI 38-101								-	B	-	-
A2.5.17. Aircraft inspection concepts TR: TOs 00-20-1 and 00-20-5								-	B	-	-
A2.5.18. Use maintenance forms TR: TO 00-20 series											
A2.5.18.1. AFTO Form 781A/K	*							3c	b	-	-
A2.5.18.2. AFTO Form 781H								-	-	-	-
A2.5.18.3. AFTO Form 244	*							2b	b	-	-
A2.5.18.4. AFTO Form 95								b	b	-	-
A2.5.18.5. AFTO Form 427	*							b	b	-	-
A2.5.18.6. AFTO Form 350								3c	-	-	-
A2.5.19. Use Automated Maintenance Systems TR: AFCSM 21 series											
A2.5.19.1. Document completed maintenance actions	*							3c	-	-	-
A2.5.19.2. Perform maintenance inquiries	*							3c	-	-	-
A2.5.19.3. Schedule maintenance discrepancies	*							3c	-	-	-
A2.5.19.4. Create aircraft discrepancies	*							3c	-	-	-
A2.5.19.5. Close aircraft discrepancies	*							3c	-	-	-
A2.5.19.6. Defer aircraft discrepancies	*							-	-	-	-
A2.5.19.7. Generate aircraft forms								-	-	-	-
A2.5.19.8. Perform parts availability inquiry, order parts and status update TR: AFMAN 23-110 and FED LOG 00-20 series	*							a	-	-	-
A2.5.20. Deficiency Reporting System								-	-	-	-
A2.5.21. Job Data Documentation (JDD)								-	-	-	-
A2.5.22. Historical Records								-	-	-	-
A2.5.23. Status Reports								-	-	-	-
A2.5.24. Configuration Management								-	-	-	-
A2.5.25. Other Automated Maintenance Systems (RAMPOD, GO-81 and IMDS) TR: AMCI 21-101 and 21-112								-	-	-	-
A2.5.26. CAMS Supply Interface TR: AFCSM 21 series; 00-20 series TOs and Applicable Aircraft -06 TOs											
A2.5.26.1. Maintenance transactions								-	-	-	-
A2.5.26.2. Supply transactions								-	-	-	-

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Specialty Training Standard 2A6X4

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
			A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
	5	7	Tng Start	Tng Comp	Trainee Initials	Trainer Initials	Certifier Initials	Course	5	7	Course
A2.5.26.3. Management/Supervision Transactions								-	-	-	-
A2.6. MAINTENANCE SUPPLY AND EQUIPMENT MANAGEMENT											
A2.6.1. Process and control material and repairable assets (DIFM) TR: AFMAN 23-110								a	B	-	-
A2.6.2. Use Product Quality Deficiency Reporting System (PQDR) TR: TO 00-35D-5 and 00-35D-54; AFCSM 21 series								a	B	-	c
A2.6.3. Use Standard Base Supply System TR: AFCSM 21 series								-	b	-	-
A2.6.4. Use supply products								-	B	-	C
A2.6.5. Maintenance Supply Concept								-	-	-	-
A2.6.6. Supply Documents Management								-	-	-	-
A2.6.7. Equipment Account Management								-	-	-	-
A2.6.8. Status of Reports and Training (SORTS)								-	-	-	-
A2.6.9. Priority System								-	-	-	-
A2.6.10. Repair Cycle Assets								-	-	-	-
A2.6.11. Classified Asset Handling								-	-	-	-
A2.6.12. Land Mobile Radios, Pagers, and Cell Phones								-	-	-	-
A2.6.13. Depot Level Repairables								-	-	-	-
A2.7. SUPERVISION											
A2.7.1. Analyze maintenance reports TR: AFIs 21-101 and 23-205; TO 00-20-1								-	-	-	-
A2.7.2. Justify changes in TR: AFI 21-101 and AFI 36 and 38 series											
A2.7.2.1. Personnel authorizations								-	-	-	-
A2.7.2.2. Equipment authorizations								-	-	-	-
A2.8. TRAINING TR: AFIs 21-112 and 36-2201											
A2.8.1. Evaluate personnel to determine needs for training								-	-	-	-
A2.8.2. Plan and supervise OJT											
A2.8.2.1. Prepare job qualification standards								-	-	-	-
A2.8.2.2. Conduct training								-	-	-	-
A2.8.3. Monitor effectiveness of training											
A2.8.3.1. Career knowledge upgrade								-	-	-	-
A2.8.3.2. Job proficiency upgrade								-	-	-	-
A2.8.3.3. Qualification								-	-	-	-
A2.8.4. Maintain training records								-	-	-	-
A2.8.5. Evaluate training programs								-	-	-	-

Specialty Training Standard 2A6X4

1. Tasks, Knowledge And Technical References	2. Core Tasks 5	2. Core Tasks 7	3. Certification For OJT A Tng Start	B Tng Comp	C Trainee Initials	D Trainer Initials	E Certifier Initials	4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1) A 3 Skill Level Course	B CDC 5	B CDC 7	C 7 Skill Level Course
A2.8.6. Recommend personnel for training TR: AFIs 36-2201 and 36-2301, AFMAN 36-2108								-	-	-	-
A2.8.7. Career Field Education and Training Plan (CFETP)								-	-	-	-
A2.8.8. Specialty Training Standard (STS)								-	-	-	-
A2.8.9. Occupational Survey Report (OSR)								-	-	-	-
A2.8.10. Utilization and Training Workshop (U&TW)								-	-	-	-
A2.9. Ancillary Common Tasks											
A2.9.1. Computer Applications (FormFlow and AFEPL)								-	-	-	-
A2.9.2. Local Area Networks (LAN)								-	-	-	-
A2.10. OPERATE/INSPECT/MAINTAIN TR: TOs 1-1-3, 32-1-101, 32B14-3-1-101, Applicable TOs											
A2.10.1. Handtools	•							3c	b	-	-
A2.10.2. Special tools and test equipment											
A2.10.2.1. Torque Wrenches	•							2b	-	-	-
A2.10.2.2. Bonding Meter	•							2b	b	-	-
A2.10.2.3. Leak Tracing Devices								-	-	-	-
A2.10.2.4. Pressurization Test Kits								-	-	-	-
A2.10.2.5. Pressure/Vacuum Gauges								-	-	-	-
A2.10.2.6. External Tank Pressure Test Adapter Assemblies								-	-	-	-
A2.10.2.7. Combustible Gas Alarms	•							2b	b	-	-
A2.10.2.8. Multimeter	•							2b	b	b	-
A2.10.2.9. Portable Lighting Equipment/ Flashlights TR: 35F5 series TOs and applicable manuals	•							2b	b	-	-
A2.10.2.10. Manometer TR: TO 35DA-11-5-1								2b	b	-	-
A2.10.2.11. Universal External Fuel Tank Certifier								-	-	-	-
A2.10.2.12. High Pressure Injection Gun								-	-	-	-
A2.10.2.13. Sealant Filleting Gun								2b	b	-	-
A2.10.2.14. Grover Injection Gun								2b	b	-	-
A2.10.2.15. Aerial refueling tester TR: TO 33D2-13-13-1								-	-	-	-
A2.10.2.16. Fuel servicing cart TR: TO 35D29-8-12-1								-	-	-	-
A2.10.2.17. Portable Purging Equipment TR: Applicable TOs/manuals								2b	b	-	-
A2.10.2.18. Pressure/Vacuum Box TR: Applicable TOs/manuals								-	-	-	-

Specialty Training Standard

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1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
			A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
	5	7	Tng Start	Tng Comp	Trainee Initials	Trainer Initials	Certifier Initials	Course	5	7	Course
A2.10.2.19. Fuel Quantity Testers (GTF-6, PSD 60-1)								-	-	-	-
A2.10.2.20. Breathing air systems TR: Applicable TOs/manuals	•							2b	b	-	-
A2.10.2.21. Explosion Proof Pneumatic Vacuum TR: Applicable manuals								3c	b	-	-
A2.10.2.22. Tensiometer								-	-	-	-
A2.10.2.23. External Fuel Tank Maintenance Stand/Dollies								-	-	-	-
A2.10.2.24. Lifting Fixtures, Slings, and Devices								-	-	-	-
A2.10.2.25. Micrometers								-	-	-	-
A2.11. FACILITIES TR: Local OIs											
A2.11.1. Open/Close Hangar Doors								-	-	-	-
A2.11.2. Operate Purging Equipment								-	-	-	-
A2.11.3. Fire Suppression System								-	-	-	-
A2.12. USE AEROSPACE GROUND EQUIPMENT TR: Applicable TOs											
A2.12.1. Centralize Aircraft Support System (CASS) TR: Applicable TOs								-	-	-	-
A2.12.2. Fuel Bowsers								-	-	-	-
A2.12.3. Liquid Nitrogen Cart TR: TO 35D29-8-3-1								-	-	-	-
A2.12.4. HDU-13 Heater TR: TO 35E7-6-9-1								a	b	-	-
A2.12.5. Maintenance Stands											
A2.12.5.1. B-1 TR: TO 35A4-2-3-5-1								2b	b	-	-
A2.12.5.2. B-2 TR: TO 35A4-2-3-11								-	b	-	-
A2.12.5.3. B-4A TR: TO 35A4-2-5-1								2b	b	-	-
A2.12.5.4. B-5A TR: TO 35A4-2-6-1								-	b	-	-
A2.12.5.5. B7-15 TR: TO 35D34-26-1								-	-	-	-
A2.12.5.6. Universal diesel powered (scissor stand) TR: TO 35A4-2-60-1								-	-	-	-
A2.12.5.7. Universal electric (scissor stand) TR: TO 35A4-2-61-1								-	-	-	-
A2.12.5.8. Platform, servicing (simon) TR: TO 35D34-31-1								-	-	-	-
A2.12.6. Powered AGE											
A2.12.6.1. Generator set (-95) TR: TO 35D12-2-14-1								-	-	-	-

Specialty Training Standard 2A6X4

1. Tasks, Knowledge And Technical References	2. Core Tasks 5	2. Core Tasks 7	3. Certification For OJT A Tng Start	B Tng Comp	C Trainee Initials	D Trainer Initials	E Certifier Initials	4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1) A 3 Skill Level Course	B CDC 5	B CDC 7	C 7 Skill Level Course
A2.12.6.2. Generator set, diesel (-86) TR: TO 35C2-3-469-11								2b	-	-	-
A2.12.6.3. Generator set (-60) TR: TO 35C2-3-372-1								2b	-	-	-
A2.12.6.4. Air conditioner, diesel driven (MA-3D) TR: TO 33-C9-9-01								-	-	-	-
A2.12.6.5. Compressor diesel (MC-7) TR: TO 34Y-244-1								-	-	-	-
A2.12.6.6. Compressor, rotary (MC2A) (lowpack) TR: TO 34Y1-87-61								2b	b	-	-
A2.12.6.7. H-1 Portable Heater TR: TO 35E7-2-11-11								-	-	-	-
A2.12.6.8. Floodlight set (NF-2) TR: TO 35F5-11-61								-	-	-	-
A2.13. AIRCRAFT GENERAL											
A2.13.1. Types of aircraft construction/ Mission Design Series/aircraft familiarization TR: Applicable TOs								A	B	-	-
A2.13.2. Types and use of hardware TR: TO 1-1A-8								B	B	-	-
A2.13.3. Fuel systems hose assemblies TR: TO 42E1-1-1								B	B	-	-
A2.13.4. Use and inspect safetying devices TR: TO 1-1A-8	•							3c	b	b	b
A2.13.5. Chafing TR: TOs 1-1A-8, 1-1A-14, and 42E-1-1-1								B	B	-	-
A2.13.6. Corrosion control TR: TO 1-1-691								A	B	-	-
A2.13.7. Fundamentals of Low Observable Materials								-	A	-	-
A2.14. ELECTRICAL CIRCUITS APPLICABLE TO AIRCRAFT FUEL SYSTEMS TR: TOs 31-1-141, 33A2-1-12-1198-1 and applicable TOs											
A2.14.1. Interpret electrical circuits								a	b	b	2b
A2.14.2. Electrical Principles								A	B	B	B
A2.14.3. Check for voltage/power at fuel system components	•							2b	b	b	3c
A2.15. FUEL TANK ENTRY TR: TO 1-1-3, AFOSH Stds 48-1, 91-25, and 161 series, and applicable aircraft TOs											
A2.15.1. Determine authorized fuel system repair locations		•						b	b	B	-

Specialty Training Standard 2A6X4

1. Tasks, Knowledge And Technical References		2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
				A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
		5	7	Trg Start	Trg Comp	Trainee Initials	Trainer Initials	Certifier Initials	Course	5	7	Course
A2.15.2.	Perform fuel system preparation checklist	•							3c	b	-	-
A2.15.3.	Drain fuel cells and tank								b	b	-	-
A2.15.4.	Perform tank purging	•							3c	b	b	-
A2.15.5.	Perform fuel tank depuddling	•							3c	b	-	-
A2.15.6.	Confined Space Procedures TR: TO 1-1-3											
A2.15.6.1.	Test tank atmosphere	•							3c	b	-	-
A2.15.6.2.	Serve as confined space team member	•							3c	b	-	-
A2.15.6.3.	Complete field permit	•							b	b	b	-
A2.15.6.4.	Perform emergency response procedures	•							b	b	-	-
A2.15.6.5.	Develop standards for confined space entry procedures								-	-	-	2c
A2.16.	INTEGRAL FUEL TANK MAINTENANCE TR: TO 1-1-3 and applicable aircraft TOs											
A2.16.1.	Fuel leak troubleshooting											
A2.16.1.1.	Locate fuel leak exit points	•							b	b	b	c
A2.16.1.2.	Perform fuel leak evaluation	•							b	b	b	c
A2.16.1.3.	Inspect tank interior for possible leak source	•							2b	b	b	-
A2.16.2.	Perform leak source isolation procedures											
A2.16.2.1.	Blowback	•							2b	b	-	-
A2.16.2.2.	Dye injection								-	b	-	-
A2.16.3.	Characteristics of sealants								B	B	B	-
A2.16.4.	Prepare structures for sealants	•							3b	b	-	-
A2.16.5.	Mix sealants	•							3b	b	-	-
A2.16.6.	Test mixed sealants								3b	b	-	-
A2.16.7.	Apply sealants											
A2.16.7.1.	Apply by filleting gun								2b	b	-	-
A2.16.7.2.	Apply by hand	•							3b	b	-	-
A2.16.7.3.	Inject non-curing								2b	b	-	-
A2.16.7.4.	Inject curing								b	b	-	-
A2.16.8.	Inspect applied sealants		•						2b	b	-	-
A2.16.9.	Make temporary repairs TR: TO 1-1-3								3b	b	-	-
A2.17.	FUEL CELLS TR: TOs 00-85A-03-1, 1-1-3, and applicable aircraft TOs											
A2.17.1.	Fuel cell constructional features								B	B	-	-

Generic Aircraft Requirements

1. Tasks, Knowledge And Technical References	2. Core Tasks 5	2. Core Tasks 7	3. Certification For OJT A Trg Start	B Trg Comp	C Trainee Initials	D Trainer Initials	E Certifier Initials	4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1) A 3 Skill Level Course	B CDC 5	B CDC 7	C 7 Skill Level Course
NOTE 1: Users are responsible for annotating training references to identify current references pending STS revision.											
NOTE 2: All tasks and knowledge identified as training requirements in column 4A will be taught during wartime. The 7-level course is not taught during wartime.											
NOTE 3: Items in column 2 marked with an asterisk (*) identify core tasks. Core tasks identified with */R are optional for ANG and AFRC.											
A3.1. AIRCRAFT GENERAL **TR: Applicable TOs**											
A3.1.1. Analytical Aircraft Troubleshooting Theory								-	-	-	C
A3.1.2. Safety Precautions								-	-	-	-
A3.1.3. Apply/Remove External Power								-	-	-	-
A3.1.4. Remove, Install, and Inspect Fuel Tubing and Couplings TR: TOs 1-1A-8, 42E-1-1-1, and applicable TOs								b	B	-	-
A3.2. ENGINE FEED AND CROSSFEED SYSTEMS **TR: Applicable aircraft TOs**											
A3.2.1. System operation								B	B	B	-
A3.2.2. Perform operational check	•							2b	b	b	-
A3.2.3. Troubleshoot system		•						b	b	b	-
A3.2.4. Remove/Install components								2b	-	-	-
A3.2.5. Inspect components								-	-	-	-
A3.3. FUEL JETTISON/DUMP SYSTEM **TR: Applicable aircraft TOs**											
A3.3.1. System operation								B	B	B	-
A3.3.2. Perform operational check	•							b	b	b	-
A3.3.3. Troubleshoot system		•						b	b	b	-
A3.3.4. Remove/Install components								b	-	-	-
A3.3.5. Inspect components								-	-	-	-
A3.4. TRANSFER SYSTEM **TR: Applicable aircraft TOs**											
A3.4.1. System operation								B	B	B	-
A3.4.2. Perform operational check	•							2b	b	b	-
A3.4.3. Troubleshoot system		•						b	b	b	-
A3.4.4. Remove/Install components								2b	-	-	-
A3.4.5. Inspect components								-	-	-	-
A3.5. GROUND REFUELING AND DEFUELING SYSTEMS **TR: Applicable aircraft TOs**											
A3.5.1. System operation								B	B	B	-

Specialty Training Standard

2A6X4

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
			A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
	5	7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Course	5	7	Course
A2.17.2. Prepare fuel cells for storage and shipment								b	b	-	-
A2.17.3. Repair fuel cells											
A2.17.3.1. Hot patch								2b	b	-	2c
A2.17.3.2. Cold patch								2b	b	-	-
A2.17.4. Inspect/prepare cell cavities								2b	b	b	3c
A2.17.5. Inspect fuel cells								2b	b	b	3c
A2.17.6. Test fuel cells								3b	b	-	-

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
			A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
	5	7	Tng Start	Tng Comp	Trainee Initials	Trainer Initials	Certifier Initials	Course	5	7	Course
A3.5.2. Perform operational check	•							2b	b	b	-
A3.5.3. Troubleshoot system		•						b	b	b	-
A3.5.4. Remove/Install components								2b	-	-	-
A3.5.5. Inspect components								-	-	-	-
A3.6. AIR REFUELING RECEIVER SYSTEM TR: Applicable TOs											
A3.6.1. System operation								B	B	B	-
A3.6.2. Perform operational check								b	b	b	-
A3.6.3. Troubleshoot system								b	b	b	-
A3.6.4. Remove/Install components								b	-	-	-
A3.6.5. Inspect components								-	-	-	-
A3.7. MANIFOLD SCAVENGE/DRAIN SYSTEM TR: Applicable TOs											
A3.7.1. System operation								B	B	B	-
A3.7.2. Perform operational check	•							b	b	b	-
A3.7.3. Troubleshoot system		•						b	b	b	-
A3.7.4. Remove/Install components								b	-	-	-
A3.7.5. Inspect components								-	-	-	-
A3.8. TANK SCAVENGE SYSTEM TR: Applicable aircraft TOs											
A3.8.1. System operation								B	B	B	-
A3.8.2. Perform operational check	•							b	b	b	-
A3.8.3. Troubleshoot system		•						b	b	b	-
A3.8.4. Remove/Install components								b	-	-	-
A3.8.5. Inspect components								-	-	-	-
A3.9. PRESSURIZATION/VENT SYSTEM TR: Applicable aircraft TOs											
A3.9.1. System operation								B	B	B	-
A3.9.2. Perform operational check	•							b	b	b	-
A3.9.3. Troubleshoot system		•						b	b	b	-
A3.9.4. Remove/Install components								2b	-	-	-
A3.9.5. Inspect components								-	-	-	-
A3.10. FUEL COOLING LOOP SYSTEM TR: Applicable Aircraft TOs											
A3.10.1. System Operation								A	B	-	-
A3.10.2. Perform Operational Check	•							-	-	-	-

1. Tasks, Knowledge And Technical References	2. Core Tasks 5	2. Core Tasks 7	3. Certification For OJT A Tng Start	B Tng Comp	C Trainee Initials	D Trainer Initials	E Certifier Initials	4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1) A 3 Skill Level Course	B CDC 5	B CDC 7	C 7 Skill Level Course
A3.10.3. Troubleshoot System		•						-	-	-	-
A3.10.4. Remove/Install Components								-	-	-	-
A3.10.5. Inspect Components								-	-	-	-
A3.11. FUEL QUANTITY INDICATING SYSTEM TR: Applicable aircraft TOs											
A3.11.1. System operation								A	B	B	-
A3.11.2. Remove/Install tank components								2b	-	-	-
A3.11.3. Inspect components								-	-	-	-
A3.12. EXTERNAL FUEL TANK MAINTENANCE TR: Applicable equipment TOs											
A3.12.1. Issue/receive external tanks								-	-	-	-
A3.12.2. Perform certification checks								-	-	-	-
A3.12.3. Troubleshoot external fuel tanks								-	b	b	-
A3.12.4. Remove/Install components								-	-	-	-
A3.12.5. Inspect components								-	-	-	-
A3.12.6. Pressure check removed external fuel tanks								-	-	-	-
A3.13. FUEL TANK ENTRY TR: TO 1-1-3, AFOSH 48-1, 91-25, 161 series, and applicable aircraft TOs											
A3.13.1. Prepare aircraft for fuel system maintenance											
A3.13.1.1. Remove/Install tank access doors and panels	•							2b	-	-	-
A3.13.1.2. Remove/Install internal braces								b	b	-	-
A3.13.1.3. Remove/Install and store fire suppression foam								2b	b	-	-
A3.13.1.4. Perform leak path analysis	•							b	b	b	-
A3.14. INTEGRAL FUEL TANK MAINTENANCE TR: TO 1-1-3 and applicable aircraft TOs											
A3.14.1. Integral tank construction features								B	B	-	-
A3.14.2. Tank and access door/panel sealing methods								B	B	-	-
A3.14.3. Perform leak source isolation procedures											
A3.14.3.1. Positive pressurization								2b	b	-	-
A3.14.3.2. Negative pressurization								-	b	-	-

1. Tasks, Knowledge And Technical References	2. Core Tasks		3. Certification For OJT					4. Proficiency Codes Used to Indicate Training/Information Provided (See Atch 1)			
			A	B	C	D	E	A 3 Skill Level	B CDC		C 7 Skill Level
	5	7	Trg Start	Trg Comp	Trainee Initials	Trainer Initials	Certifier Initials	Course	5	7	Course
A3.15. FUEL CELLS TR: TOs 00-85A-03-1, 1-1-3, and applicable aircraft TOs											
A3.15.1. Perform leak source isolation								b	b	b	-
A3.15.2. Remove/Install fuel cells								2b	b	-	-

APPENDIX C

FIELD EVALUATION QUESTIONNAIRE (FEQ) SURVEY

INSTRUMENT AND REPORT EXAMPLE

10 Feb 97

MEMORANDUM FOR

FROM: 82 TRG/TTS
620 9th AVENUE, STE 1
SHEPPARD AFB, TX 76311-2334

SUBJECT: Supervisor's Field Evaluation Questionnaire-Project # 97-001

1. The 82d Training Group is responsible for the Aircraft Fuel Systems Apprentice Course, J3ABR2A634 001. This course is currently undergoing a quality assessment, and the attached questionnaire is part of that process. Please complete the questionnaire; your response to each question is critical.

2. Your input will become a vital portion of the course assessment process. This process is essential to ensure graduates meet Air Force needs. The information you provide will become a crucial element in improving our training. Our mission is to train airmen--instilling technical and military war fighting skills and values.

3. If you have any questions, please call me at DSN 736-5237, or you can reach my office by calling the 24-hour Customer Service Information Line, DSN 736-5236.

4. Thank you for your time and effort in completing this important questionnaire on the training the graduate received. Please return the completed AETC Form 1610 and the Remarks Sheet to the Base Education and Training Manager.

RONALD L. LOEFFLER, MSgt, USAF
Training Evaluator, 82d Training Group

Attachment:
Supervisor's Field Evaluation Questionnaire

NOTE: According to Air Force Instruction 36-2201, Developing, Managing and Conducting Training, you must complete this questionnaire. (Please return it within four weeks of receipt).

10 Feb 97

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Supervisor's Field Evaluation Questionnaire

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SUPERVISOR'S FIELD EVALUATION QUESTIONNAIRE FOR COURSE
J3ABR2A634 001
Aircraft Fuel Systems Apprentice
PROJECT # 97-001

INSTRUCTIONS: READ THIS INFORMATION BEFORE YOU PROCEED!
This questionnaire will give us feedback about Aircraft Fuel Systems training. Complete all three sections. **Section I** contains general information pertaining to the graduate and to you, the supervisor. **Section II** pertains to the graduate's job proficiency as related to the Career Field Education and Training Plan (CFETP), 2A6X4, dated August 1996. **Section III** is for additional remarks/comments. Enclosed is one computerized answer sheet, AETC Form 1610. Please return the completed AETC Form 1610 and the Remarks sheet to the Base Education and Training Manager. **Observe the numbering sequence.** Some numbers on AETC Form 1610 are not used.)

NOTE: USE ONLY A NO. 2 PENCIL FOR MARKING ON THE QUESTIONNAIRE. IT IS IMPORTANT NOT TO DAMAGE THE ANSWER SHEET. Staple holes, frayed corners, paper clip impressions, and extraneous pencil marks will cause our optical mark reader to reject the answer sheet.

SECTION I
Use SIDE A of AETC Form 1610

1. IF THIS QUESTIONNAIRE CANNOT BE COMPLETED, indicate the **ONE** reason which best describes why, and then return the entire package.
IF YOU CAN COMPLETE THIS QUESTIONNAIRE, proceed with Item 2.

0. Works in another AFSC (explain on remarks sheet)
1. Discharged
2. Member does not meet standards of conduct
3. No security clearance
4. Transferred/reassigned
5. Not assigned/assignment canceled
6. Disqualified under Personnel Reliability Program
7. Newly assigned supervisor/unable to rate graduate
8. Medically disqualified
9. Other (explain on remarks sheet)

NOTE: All items are one digit response items. Mark only one answer for each item.

2. Indicate the graduate's primary area of assignment.

0. Aircraft Maintenance (Flightline)
1. Aircraft Maintenance (In-Shop)
2. Aircraft Maintenance (Flightline and In-Shop)
3. Tank Farm/WRM

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3. How long have you supervised the graduate?
   0. Less than 6 months
   1. 6 months - 1 year
   2. 1 - 2 years
   3. 2 - 3 years
   4. More than 3 years

4. How many hours per week do you provide OJT to the graduate?
   0. 1 to 10 hours
   1. 11 to 20 hours
   2. 21 to 30 hours
   3. 31 to 40 hours

Leave 5 through 19 blank.

20. What Aircraft does the graduate work on?
   A. A-10
   B. F-15
   C. F-16
   D. F-117A
   E. KC-10
   F. B-1
   G. C-17
   H. C-130
   I. KC/C-135
   J. B-2
   K. B-52
   L. C-141
   M. Other (Explain on the Remarks sheet)

Leave 21 through 28 blank.

NOTE: ITEMS 29 THROUGH 30 ARE ONE-DIGIT RESPONSE ITEMS. Choose either YES or NO, (T = YES, F = NO). Only one answer is acceptable.

29. Do you have any suggestions which would help improve the course? (If YES, specify on the remarks sheet located at the back of this questionnaire).
T F

30. Are there any additional subject areas which you believe should be included in the course? (If YES, specify on Remarks sheet).
T F

Leave 31 through 34 blank.

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SECTION II
Use SIDE B of AETC Form 1610

The following job categories were extracted from the STS. Please rate the graduate's **PERFORMANCE LEVEL** (how well the graduate can perform that task based on the training received at Sheppard AFB) using the category listed below.

PERFORMANCE LEVEL (PL)
0. = INCAPABLE. Can do no part of the task. **Needs to be told or shown how to do it.**
1. = EXTREMELY LIMITED. Can do simple parts of the task. **Needs to be told or shown how to do most of the task.**
2. = PARTIALLY PROFICIENT. Can do most parts of the task. **Needs help on the hardest parts.**
3. = COMPETENT/(PROFICIENT). Can do all parts of the task. **Needs only spot check of completed work.**
4. = HIGHLY PROFICIENT. Can do the complete task quickly and accurately. **Can tell others how to do the task.**
5. = NOT OBSERVED/REQUIRED LATER. Has not performed task in current assignment.
0+5. = NOT REQUIRED. Not performed at this work center. (If this definition fits your situation, please darken both the "0" and "5" codes. Example ● 1 2 3 4 ●

35. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Grounding and bonding aircraft and equipment) *(STS: A2.2.2)*

36. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Practice housekeeping consistent with safety of personnel and equipment) *(STS: A2.2.3)*

37. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Apply safety precautions when using tools and test equipment) *(STS: A2.2.4)*

38. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Apply precautions for handling fuels and chemicals) *(STS: A2.2.5)*

39. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Use and maintain personal protective equipment) *(STS: A2.2.7)*

40. TECHNICAL PUBLICATIONS (Use technical publications) *(STS: A2.3.2)*

41. MAINTENANCE MANAGEMENT (Use maintenance forms) *(STS: A2.5.4)*

42. MAINTENANCE MANAGEMENT (Document completed maintenance actions) *(STS: A2.5.5.1)*

43. MAINTENANCE MANAGEMENT (Perform maintenance inquires) *(STS: A2.5.5.2)*

44. MAINTENANCE MANAGEMENT (Schedule maintenance discrepancies) *(STS: A2.5.5.3)*

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PERFORMANCE LEVEL (PL)
0. = INCAPABLE.
1. = EXTREMELY LIMITED.
2. = PARTIALLY PROFICIENT.
3. = COMPETENT/(PROFICIENT).
4. = HIGHLY PROFICIENT.
5. = NOT OBSERVED/REQUIRED LATER.
0+5. = NOT REQUIRED.

45. TOOLS AND TEST EQUIPMENT (Use and maintain handtools) *(STS: A2.9.1)*

46. TOOLS AND TEST EQUIPMENT (Use and maintain special tools and test equipment) *(STS: A2.9.2)*

47. TOOLS AND TEST EQUIPMENT (Use aerospace ground equipment) *(STS: A2.9.3)*

48. AIRCRAFT GENERAL (Use and inspect safetying devices) *(STS: A2.10.4)*

49. ENGINE FEED AND CROSSFEED SYSTEMS (Perform operational check) *(STS: A2.12.2)*

50. ENGINE FEED AND CROSSFEED SYSTEMS (Remove/Install components) *(STS: A2.12.4)*

51. TRANSFER SYSTEM (Perform operational check) *(STS: A2.14.2)*

52. TRANSFER SYSTEM (Remove/Install components) *(STS: A2.14.4)*

53. GROUND REFUELING AND DEFUELING SYSTEMS (Remove/Install components) *(STS: A2.15.4)*

54. PRESSURIZATION/VENT SYSTEM (Remove/Install components) *(STS: A2.19.4)*

55. FUEL TANK ENTRY (Perform fuel systems preparation checklist) *(STS: A2.23.2.1)*

56. FUEL TANK ENTRY (Remove/Install tank access doors and panels) *(STS: A2.23.2.3)*

57. FUEL TANK ENTRY (Perform tank purging) *(STS: A2.23.4)*

58. FUEL TANK ENTRY (Test tank atmosphere) *(STS: A2.23.5.1)*

59. FUEL TANK ENTRY (Serve as confined space team member) *(STS: A2.23.5.2)*

60. FUEL TANK ENTRY (Perform fuel tank depuddling) *(STS: A2.23.5.5)*

61. INTEGRAL FUEL TANK MAINTENANCE (Inspect tank for possible leak source) *(STS: A2.24.3.4)*

62. INTEGRAL FUEL TANK MAINTENANCE (Perform leak source isolation procedures) *(STS: A2.24.3.5)*

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PERFORMANCE LEVEL (PL)
0. = INCAPABLE.
1. = EXTREMELY LIMITED.
2. = PARTIALLY PROFICIENT.
3. = COMPETENT/(PROFICIENT).
4. = HIGHLY PROFICIENT.
5. = NOT OBSERVED/REQUIRED LATER.
0+5. = NOT REQUIRED.

63. INTEGRAL FUEL TANK MAINTENANCE (Prepare structures for sealants) *(STS: A2.24.4)*

64. INTEGRAL FUEL TANK MAINTENANCE (Mix sealants) *(STS: A2.24.5)*

65. INTEGRAL FUEL TANK MAINTENANCE (Test mixed sealants) *(STS: A2.24.6)*

66. INTEGRAL FUEL TANK MAINTENANCE (Apply by hand) *(STS: A2.24.7.2)*

67. INTEGRAL FUEL TANK MAINTENANCE (Inspect applied sealants) *(STS: A2.24.8)*

68. INTEGRAL FUEL TANK MAINTENANCE (Make temporary repairs) *(STS: A2.24.9)*

69. FUEL CELLS (Remove/Install fuel cells) *(STS: A2.25.4)*

70. FUEL CELLS (Repair fuel cells) *(STS: A2.25.5)*

71. FUEL CELLS (Inspect fuel cells) *(STS: A2.25.7)*

72. FUEL CELLS (Test fuel cells) *(STS: A2.25.8)*

Leave 73 through 112 blank.

113. Rate the graduate's OVERALL preparation for the job.

0. UNSATISFACTORY **
1. MARGINAL **
2. SATISFACTORY
3. EXCELLENT
4. OUTSTANDING

**** If you marked (0) or (1) in item 113, please respond in item 114 and explain on the remarks sheet.**

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114. Indicate the primary reason that best accounts for the low rating of item 113. (Mark only one)

0. Not adequately trained
1. Trained on non-job related equipment
2. Trained with outdated materials
3. Trained on outdated equipment/trainers
4. Inability to understand instructions
5. OTHER (Explain on the Remarks sheet)

If you have any questions, please call me at DSN 736-5237, or you can reach my office by calling the 24-hour Customer service Information Line, DSN 736-5236

Please complete the top portion of the Remarks Sheet.

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SUPERVISOR'S FIELD EVALUATION QUESTIONNAIRE FOR COURSE
J3ABR2A634 001
Aircraft Fuel Systems Apprentice
PROJECT # 97-001

NAME: ______________________ **AFSC:** ______________

DSN: ______________________ **BASE:** ______________

COMMAND: ______________________ **RANK:** ______________

SECTION III

ITEM #	REMARKS

Don't forget to return the AETC Form 1610 and the Remarks Sheet to the Base Education and Training Manager.

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PREPARED: *20 May 98*

STS/CTS DATA SUMMARY

SUPERVISOR'S RATING OF TRAINING

PROJECT ID: 98001
COURSE ID: 3ABR2A634 001
RETURNED: 127
TOTAL USABLE: 118

TRAINING STANDARD	PERFORMANCE LEVEL	# RESPONDING	# NOT REQUIRED	# NOT OBSERVED/REQUIRED LATER	#/% PERFORMING/WILL PERFORM TASK	#/% INCAPABLE	#/% EXTREMELY LIMITED	#/% PARTIALLY PROFICIENT	#/% COMPETENT	#/% HIGHLY PROFICIENT	% PERFORMING AT OR ABOVE SPECIFIED LEVEL
35. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Grounding and bonding aircraft and equipment) *(STS: A2.2.2)*	3c	118		2	116 100	1 1	4 3	17 15	53 48	41 35	83
36. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Practice housekeeping consistent with safety of personnel and equipment) *(STS: A2.2.3)*	3c	118		1	117 100	1 1	4 3	19 16	49 42	44 38	80
37. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Apply safety precautions when using tools and test equipment) *(STS: A2.2.4)*	3c	118		1	117 100	1 1	5 4	25 21	52 44	34 29	73
38. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Apply precautions for handling fuels and chemicals) *(STS: A2.2.5)*	3c	118		2	116 100	1 1	2 2	27 23	53 46	33 28	74
39. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Use and maintain personal protective equipment) *(STS: A2.2.7)*	3c	118		2	116 100	1 1	8 7	19 16	57 49	31 27	76
40. TECHNICAL PUBLICATIONS (Use technical publications) *(STS: A2.3.2)*	3c	118		1	117 100	3 3	13 11	46 39	45 39	10 9	48
41. MAINTENANCE MANAGEMENT (Use maintenance forms) *(STS: A2.5.4)*	3c	118		3	115 100	4 4	16 14	55 48	32 28	8 7	35
42. MAINTENANCE MANAGEMENT (Document completed maintenance actions) *(STS: A2.5.5.1)*	3c	118		4	114 100	7 6	21 18	43 38	38 33	5 4	37

TRAINING STANDARD	PL	RE	NR	NO	PT	IN	EL	PP	CO	HP	%L +
43. MAINTENANCE MANAGEMENT (Perform maintenance inquiries) *(STS: A2.5.5.2)*	3c	118	2	9	107 98	13 12	22 21	50 47	17 16	5 5	21
44. MAINTENANCE MANAGEMENT (Schedule maintenance discrepancies) *(STS: A2.5.5.3)*	3c	118	7	18	93 94	15 16	23 25	45 48	8 9	2 2	11
45. TOOLS AND TEST EQUIPMENT (Use and maintain handtools) *(STS: A2.9.1)*	3c	118			118 100		2 2	24 20	51 43	41 35	78
46. TOOLS AND TEST EQUIPMENT (Use and maintain special tools and test equipment) *(STS: A2.9.2)*	3c	118		1	117 100	4 3	5 4	32 27	49 42	27 23	65
47. TOOLS AND TEST EQUIPMENT (Use aerospace ground equipment) *(STS: A2.9.3)*	2b	118		2	116 100	7 6	9 8	35 30	44 38	21 18	86
48. TOOLS AND TEST EQUIPMENT (Use and maintain bonding meter) *(STS: A2.9.4)*	2b	118	18	17	83 85	7 8	18 22	28 34	27 33	3 4	70
49. AIRCRAFT GENERAL (Use and inspect safetying devices) *(STS: A2.10.4)*	3c	118		6	112 100	3 3	10 9	32 29	48 43	19 17	60
50. ELECTRICAL CIRCUITS APPLICABLE TO AIRCRAFT FUEL SYSTEMS (Use multimeter) *(STS: A2.11.2)*	2b	118	4	8	106 97	7 7	26 25	51 49	17 16	4 4	68
51. ENGINE FEED AND CROSSFEED SYSTEMS (Perform operational check) *(STS: A2.12.2)*	2b	118	1	5	112 99	7 6	22 20	44 39	34 30	5 5	74
52. ENGINE FEED AND CROSSFEED SYSTEMS (Remove/Install components) *(STS: A2.12.4)*	2b	118	1	3	114 99	3 3	10 9	36 32	52 46	13 11	88
53. ENGINE FEED AND CROSSFEED SYSTEMS (Inspect components) *(STS: A2.12.5)*	2b	118	5	22	91 96	2 2	18 20	40 44	26 29	5 6	78
54. FUEL JETTISON/DUMP SYSTEM (Inspect components) STS: A2.13.5)	2b	118	11	23	84 91	2 2	17 21	35 42	25 30	4 5	77
55. TRANSFER SYSTEM (Perform operational check) *(STS: A2.14.2)*	2b	118	3	5	110 97	5 5	20 18	42 38	39 36	4 4	77
56. TRANSFER SYSTEM (Remove/Install components) *(STS: A2.14.4)*	2b	118	3	3	112 97	2 2	12 11	34 31	48 43	15 14	87
57. TRANSFER SYSTEM (Inspect components) *(STS: A2.14.5)*	2b	118	6	22	90 95	2 2	19 21	40 44	25 28	4 4	77
58. GROUND REFUELING AND DEFUELING SYSTEMS (Perform operational check) *(STS: A2.15.2)*	2b	118	1	4	113 99	6 5	21 19	46 41	36 32	4 4	76
59. GROUND REFUELING AND DEFUELING SYSTEMS (Remove/Install components) *(STS: A2.15.4)*	2b	118	1	3	114 99	2 2	12 11	38 33	48 42	14 12	87
60. GROUND REFUELING AND DEFUELING SYSTEMS (Inspect components) *(STS: A2.15.5)*	2b	118	5	23	90 96	3 3	19 21	46 51	19 21	3 3	76
61. AIR REFUELING RECEIVER SYSTEM (Inspect components) *(STS: A2.16.5)*	2b	118	14	24	80 88	5 6	16 20	36 45	21 26	2 3	74

TRAINING STANDARD	PL	RE	NR	NO	PT	IN	EL	PP	CO	HP	%L +
62. MANIFOLD SCAVENGE/DRAIN SYSTEM (Inspect components) *(STS A2.17.5)*	2b	118	15	26	77 87	3 4	19 25	33 43	21 27	1 1	71
63. TANK SCAVENGE SYSTEM (Inspect components) *(STS: A2.18.5)*	2b	118	16	28	74 86	3 4	17 23	34 46	19 26	1 1	73
64. PRESSURIZATION/VENT SYSTEM (Remove/Install components) *(STS: A2.19.4)*	2b	118	1	6	111 99	2 2	14 13	40 36	42 38	13 12	85
65. PRESSURIZATION/VENT SYSTEM (Inspect components) *(STS: A2.19.5)*	2b	118	4	25	89 97	3 3	22 25	37 42	22 25	5 6	72
66. FUEL QUANTITY INDICATING SYSTEM (Remove/Install tank components) *(STS: A2.20.2)*	2b	118		6	112 100	2 2	13 12	35 31	45 40	17 15	86
67. FUEL QUANTITY INDICATING SYSTEM (Inspect components) *(STS: A2.20.4)*	2b	118	4	22	92 97	1 1	22 24	43 47	21 23	5 5	75
68. FUEL TANK ENTRY (Prepare aircraft for fuel system maintenance, perform fuel systems preparation checklist) *(STS: A2.23.2.1)*	3c	118	1	3	114 99	3 3	6 5	34 30	31 27	40 35	62
69. FUEL TANK ENTRY (Prepare aircraft for fuel system maintenance, remove/install tank access doors and panels) *(STS: A2.23.2.3)*	2b	118	1	3	114 99	1 1	4 4	28 25	37 33	44 39	95
70. FUEL TANK ENTRY (Prepare aircraft for fuel system maintenance, remove/install and store fire suppression foam) *(STS: A2.23.4)*	2b	118	26	10	82 78	3 4	4 5	27 33	30 37	18 22	91
71. FUEL TANK ENTRY (Perform tank purging) *(STS: A2.23.4)*	2b	118	1	4	113 99	1 1	5 4	22 20	44 39	41 36	95
72. FUEL TANK ENTRY (Perform confined space entry procedures, test tank atmosphere) *(STS: A2.23.5.1)*	3c	118	1	5	112 99	4 4	4 4	29 26	44 40	30 27	66
73. FUEL TANK ENTRY (Perform confined space entry procedures, serve as confined space team member) *(STS: A2.23.5.2)*	3c	118	1	4	113 99	2 2	8 7	25 22	46 41	31 28	69
74. FUEL TANK ENTRY (Perform confined space entry procedures, perform fuel tank depuddling) *(STS: A2.23.5.5)*	3b	118	1	5	112 99	1 1	5 5	23 21	47 42	36 32	73
75. INTEGRAL FUEL TANK MAINTENANCE (Fuel leak troubleshooting, inspect tank for possible leak source) *(STS: A2.24.3.4)*	2b	118	1	5	112 99	3 3	16 14	55 49	25 22	13 12	83
76. INTEGRAL FUEL TANK MAINTENANCE (Fuel leak troubleshooting, perform leak source isolation procedures) *(STS: A2.24.3.5)*	2b	118	1	9	108 99	4 4	19 18	59 55	15 14	11 10	78
77. INTEGRAL FUEL TANK MAINTENANCE (Prepare structures for sealants) *(STS: A2.24.4)*	3b	118	3	9	106 97		9 9	39 37	40 38	18 17	55
78. INTEGRAL FUEL TANK MAINTENANCE (Mix sealants) *(STS: A2.24.5)*	3b	118	3	7	108 97	2 2	4 4	24 22	46 43	32 30	73

TRAINING STANDARD	PL	RE	NR	NO	PT	IN	EL	PP	CO	HP	%L +
79. INTEGRAL FUEL TANK MAINTENANCE (Test mixed sealants) *(STS: A2.24.6)*	3b	118	5	11	102 96	3 3	10 11	37 36	32 31	20 20	51
80. INTEGRAL FUEL TANK MAINTENANCE (Apply sealants, apply by filleting gun) *(STS: A2.24.7.1)*	2b	118	14	17	87 88	1 1	14 16	37 43	28 32	7 8	83
81. INTEGRAL FUEL TANK MAINTENANCE (Apply sealants, apply by hand) *(STS: A2.24.7.2)*	2b	118	3	7	108 97		9 8	30 28	51 47	18 17	92
82. INTEGRAL FUEL TANK MAINTENANCE (Apply sealants, inject non-curing) *(STS: A2.24.7.3)*	2b	118	32	10	76 73	2 3	8 11	31 41	19 25	16 21	86
83. INTEGRAL FUEL TANK MAINTENANCE (Inspect applied sealants) *(STS: A2.24.8)*	2b	118	7	17	94 94		17 18	32 34	32 34	13 14	82
84. INTEGRAL FUEL TANK MAINTENANCE (Make temporary repairs) *(STS: A2.24.9)*	3b	118	4	9	105 97	3 3	10 10	35 33	37 35	20 19	54
85. FUEL CELLS (Remove/Install fuel cells) *(STS: A2.25.4)*	3b	118	17	17	84 86	4 5	10 12	39 46	26 31	5 6	37
86. FUEL CELLS (Repair fuel cells) *(STS: A2.25.5)*	2b	118	51	27	40 54	6 15	9 23	17 44	7 18		62
87. FUEL CELLS (Inspect cell cavities) *(STS: A2.25.6)*	2b	118	20	27	71 83	5 7	14 20	33 47	16 23	3 4	73
88. FUEL CELLS (Inspect fuel cells) *(STS: A2.25.7)*	2b	118	21	23	74 82	5 7	13 18	36 49	15 20	5 7	75
89. FUEL CELLS (Test fuel cells) *(STS: A2.25.8)*	3b	118	25	23	70 79	7 10	7 10	34 49	14 20	7 10	30

% SATISFACTORY OR BETTER
 # OUTSTANDING
 # EXCELLENT
 # SATISFACTORY
 # MARGINAL
 # UNSATISFACTORY
 # RESPONDING

		# RESPONDING				# UNSATISFACTORY	# MARGINAL	# SATISFACTORY	# EXCELLENT	# OUTSTANDING	% SATISFACTORY OR BETTER
90. Please indicate the OVERALL rating of the course.		111				3 3	10 9	59 53	33 30	6 5	88

PREPARED *21 May-98*

BACKGROUND DATA SUMMARY

PROJECT ID: 98001

(GRADUATE)

COURSE ID: **3ABR2A634 001**

	TOTAL	PERCENT	N/R
1. IF THIS QUESTIONNAIRE CANNOT BE COMPLETED, indicate the ONE reason which best describes why, and then return the entire package.	9	7	113
Works in another AFSC	0	0	
Awaiting security clearance	1	1	
Working in another duty position	0	0	
Attending additional formal training	0	0	
Medically disqualified	1	1	
Working Quality Control	0	0	
Working in Job/Production Control	0	0	
Other	7	6	
2. Indicate your primary area of assignment.	103	97	10
Aircraft Maintenance (Flightline)	11	10	
Aircraft Maintenance (In-Shop)	4	4	
Aircraft Maintenance (Flightline and In-Shop)	83	78	
Tank Farm/WRM	5	5	
3. How long have you been performing your present duties?	103	97	10
1 to 16 weeks	15	14	
17 to 18 weeks	8	8	
19 to 20 weeks	5	5	
21 to 22 weeks	8	8	
23 to 24 weeks	6	6	
More than 24 weeks	61	58	
4. How many hours per week do you spend under direct supervision?	103	97	10
1 to 10 hours	16	15	
11 to 20 hours	12	11	
21 to 30 hours	26	25	
31 to 40 hours	49	46	

	TOTAL	PERCENT	N/R
5. How many times per week do you input/retrieve data from CAMS/G081?	98	92	15
Do not use CAMS/G081	28	26	
1 to 5 times	51	48	
6 to 10 times	8	8	
11 to 15 times	6	6	
16 to 20 times	4	4	
21 times or more	1	1	
20. What aircraft do you work on?			
A-10	21	17	
F-15	35	28	
F-16	29	23	
F-117A	5	4	
KC-10	4	3	
B-1	17	14	
C-17	2	2	
C-130	31	25	
KC/C-135	14	11	
B-2	1	1	
B-52	4	3	
C-141	5	4	
Other	6	5	
29. Do you have any suggestions which would help improve the course?	118	98	3
T	9	8	
F	101	90	
30. Are there any additional subject areas which you believe should be included in the course?	111	98	2
T	4	4	
F	107	94	
31. Did you experience difficulty performing your duties due to inadequate resident training?	108	98	5
T	9	8	
F	99	90	

PREPARED: 21 May 98

STS/CTS DATA SUMMARY

GRADUATE'S RATING OF TRAINING

PROJECT ID: 98001
COURSE ID: 3ABR2A634 001
RETURNED: 122
TOTAL USABLE: 113

TRAINING STANDARD	PERFORMANCE LEVEL	# RESPONDING	# NOT REQUIRED	# TASK NOT YET PERFORMED	#/% PERFORMING/WILL PERFORM TASK	#/% UNSATISFACTORY	#/% MARGINAL	#/% SATISFACTORY	#/% EXCELLENT	#/% OUTSTANDING	% PERFORMING AT SATISFACTORY OR BETTER
35. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Grounding and bonding aircraft and equipment) *(STS: A2.2.2)*	3c	113		1	112 100			11 10	29 26	72 64	90
36. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Practice housekeeping consistent with safety of personnel and equipment) *(STS: A2.2.3)*	3c	113		1	112 100			12 11	36 32	64 57	89
37. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Apply safety precautions when using tools and test equipment) *(STS: A2.2.4)*	3c	113		1	112 100		1 1	11 10	49 44	51 46	90
38. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Apply precautions for handling fuels and chemicals) *(STS: A2.2.5)*	3c	113			111 100		1 1	14 13	45 41	51 46	87
39. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Use and maintain personal protective equipment) *(STS: A2.2.7)*	3c	113		1	112 100		1 1	16 14	42 38	53 47	85
40. TECHNICAL PUBLICATIONS (Use technical publications) *(STS: A2.3.2)*	3c	113		1	112 100	1 1	6 5	33 30	41 37	31 28	65
41. MAINTENANCE MANAGEMENT (Use maintenance forms) *(STS: A2.5.4)*	3c	113		2	111 100		5 5	40 36	45 41	21 19	60
42. MAINTENANCE MANAGEMENT (Document completed maintenance actions) *(STS: A2.5.5.1)*	3c	113		3	110 100	3 3	12 11	34 31	46 42	15 14	56
43. MAINTENANCE MANAGEMENT (Perform maintenance inquiries) *(STS: A2.5.5.2)*	3c	113	1	6	106 99	7 11	11 10	30 38	42 40	6 6	46

TRAINING STANDARD	PL	RE	NR	NO	PT	UN	MA	SA	EX	OU	%S +
44. MAINTENANCE MANAGEMENT (Schedule maintenance discrepancies) *(STS: A2.5.5.3)*	3c	113	2	9	102 98	8 8	19 19	42 41	31 31	2 2	32
45. TOOLS AND TEST EQUIPMENT (Use and maintain handtools) *(STS: A2.9.1)*	3c	113		1	112 100		2 2	14 13	37 33	59 53	86
46. TOOLS AND TEST EQUIPMENT (Use and maintain special tools and test equipment) *(STS: A2.9.2)*	3c	113		2	111 100		7 6	26 23	39 35	39 35	70
47. TOOLS AND TEST EQUIPMENT (Use aerospace ground equipment) *(STS: A2.9.3)*	2b	113		1	112 100		9 8	29 26	44 39	30 27	93
48. TOOLS AND TEST EQUIPMENT (Use and maintain bonding meter) *(STS: A2.9.4)*	2b	113	4	15	94 96	8 9	15 16	30 32	33 35	8 9	80
49. AIRCRAFT GENERAL (Use and inspect safetying devices) *(STS: A2.10.4)*	3c	113	1	1	111 99		14 13	23 21	48 43	26 23	65
50. ELECTRICAL CIRCUITS APPLICABLE TO AIRCRAFT FUEL SYSTEMS (Use multimeter) *(STS: A2.11.2)*	2b	113		5	108 100	5 5	19 18	35 32	33 31	16 15	78
51. ENGINE FEED AND CROSSFEED SYSTEMS (Perform operational check) *(STS: A2.12.2)*	2b	113		3	110 100	3 3	16 15	37 34	37 34	17 16	84
52. ENGINE FEED AND CROSSFEED SYSTEMS (Remove/Install components) *(STS: A2.12.4)*	2b	113		5	108 100	1 1	10 9	29 27	47 44	21 19	90
53. ENGINE FEED AND CROSSFEED SYSTEMS (Inspect components) *(STS: A2.12.5)*	2b	113	1	7	106 99	2 2	19 18	35 33	40 38	10 9	80
54. FUEL JETTISON/DUMP SYSTEM (Inspect components) *(STS: A2.13.5)*	2b	113	3	15	95 97	4 4	15 16	37 39	29 31	10 11	81
55. TRANSFER SYSTEM (Perform operational check) *(STS: A2.14.2)*	2b	113		3	110 100	1 1	17 16	32 29	41 37	19 17	83
56. TRANSFER SYSTEM (Remove/Install components) *(STS: A2.14.4)*	2b	113	1	3	109 99	1 1	10 9	29 27	48 43	21 19	90
57. TRANSFER SYSTEM (Inspect components) *(STS: A2.14.5)*	2b	113		6	107 100	4 4	13 12	37 35	39 36	14 13	84
58. GROUND REFUELING AND DEFUELING SYSTEMS (Perform operational check) *(STS: A2.15.2)*	2b	113		2	111 100	3 3	21 19	29 26	43 39	15 14	79
59. GROUND REFUELING AND DEFUELING SYSTEMS (Remove/Install components) *(STS: A2.15.4)*	2b	113		4	109 100	3 3	11 10	36 33	43 39	16 15	87
60. GROUND REFUELING AND DEFUELING SYSTEMS (Inspect components) *(STS: A2.15.5)*	2b	113		4	109 100	5 5	13 12	45 41	39 36	7 6	83
61. AIR REFUELING RECEIVER SYSTEM (Inspect components) *(STS: A2.16.5)*	2b	113	5	8	100 96	8 8	14 14	38 38	34 34	6 6	78
62. MANIFOLD SCAVENGE/DRAIN SYSTEM (Inspect components) *(STS A2.17.5)*	2b	113	3	9	101 97	5 5	13 13	45 45	31 31	7 7	83

TRAINING STANDARD	PL	RE	NR	NO	PT	UN	MA	SA	EX	OU	%S +
63. TANK SCAVENGE SYSTEM (Inspect components) *(STS: A2.18.5)*	2b	113	1	10	102 99	6 6	10 10	43 42	33 32	10 10	84
64. PRESSURIZATION/VENT SYSTEM (Remove/Install components) *(STS: A2.19.4)*	2b	113		3	110 100	3 3	12 11	33 30	45 41	17 16	87
65. PRESSURIZATION/VENT SYSTEM (Inspect components) *(STS: A2.19.5)*	2b	113	1	6	106 99	6 6	15 14	38 36	39 37	8 8	81
66. FUEL QUANTITY INDICATING SYSTEM (Remove/Install tank components) *(STS: A2.20.2)*	2b	113		7	106 100	2 2	9 9	32 30	46 43	17 16	89
67. FUEL QUANTITY INDICATING SYSTEM (Inspect components) *(STS: A2.20.4)*	2b	113		7	106 100	4 4	13 12	33 31	44 42	12 11	84
68. FUEL TANK ENTRY (Prepare aircraft for fuel system maintenance, perform fuel systems preparation checklist) *(STS: A2.23.2.1)*	3c	113		3	110 100		6 6	15 14	48 44	41 37	81
69. FUEL TANK ENTRY (Prepare aircraft for fuel system maintenance, remove/install tank access doors and panels) *(STS: A2.23.2.3)*	2b	113	1	3	109 99		4 4	17 16	36 33	52 48	96
70. FUEL TANK ENTRY (Prepare aircraft for fuel system maintenance, remove/install and store fire suppression foam) *(STS: A2.23.4)*	2b	113	12	9	92 88	5 5	5 5	20 22	33 36	29 32	90
71. FUEL TANK ENTRY (Perform tank purging) *(STS: A2.23.4)*	2b	113		5	108 100		2 2	14 13	41 38	51 47	98
72. FUEL TANK ENTRY (Perform confined space entry procedures, test tank atmosphere) *(STS: A2.23.5.1)*	3c	113	1	5	107 99	2 2	5 5	20 19	35 33	45 42	75
73. FUEL TANK ENTRY (Perform confined space entry procedures, serve as confined space team member) *(STS: A2.23.5.2)*	3c	113	1	4	108 99	1 1	4 4	20 19	31 29	52 48	77
74. FUEL TANK ENTRY (Perform confined space entry procedures, perform fuel tank depuddling) *(STS: A2.23.5.5)*	3b	113		7	106 100	2 2	5 5	16 15	35 33	48 45	78
75. INTEGRAL FUEL TANK MAINTENANCE (Fuel leak troubleshooting, inspect tank for possible leak source) *(STS: A2.24.3.4)*	2b	113		5	108 100	2 2	16 15	28 26	39 36	23 21	83
76. INTEGRAL FUEL TANK MAINTENANCE (Fuel leak troubleshooting, perform leak source isolation procedures) *(STS: A2.24.3.5)*	2b	113		6	107 100	2 2	18 17	30 28	34 32	23 22	82
77. INTEGRAL FUEL TANK MAINTENANCE (Prepare structures for sealants) *(STS: A2.24.4)*	3b	113	1	6	106 99	1 1	6 6	16 15	45 43	38 36	79
78. INTEGRAL FUEL TANK MAINTENANCE (Mix sealants) *(STS: A2.24.5)*	3b	113		5	108 100	1 1	5 5	15 14	39 36	48 44	80
79. INTEGRAL FUEL TANK MAINTENANCE (Test mixed sealants) *(STS: A2.24.6)*	3b	113		7	106 100	1 1	6 5	26 23	31 27	42 37	64

TRAINING STANDARD	PL	RE	NR	NO	PT	UN	MA	SA	EX	OU	%S +
80. INTEGRAL FUEL TANK MAINTENANCE (Apply sealants, apply by filleting gun) *(STS: A2.24.7.1)*	2b	113	3	13	97 97	5 4	7 6	29 26	30 27	26 23	90
81. INTEGRAL FUEL TANK MAINTENANCE (Apply sealants, apply by hand) *(STS: A2.24.7.2)*	2b	113		7	106 100	1 1	5 4	23 20	37 33	40 35	95
82. INTEGRAL FUEL TANK MAINTENANCE (Apply sealants, inject non-curing) *(STS: A2.24.7.3)*	2b	113	12	11	90 89	1 1	12 11	24 21	26 23	27 24	88
83. INTEGRAL FUEL TANK MAINTENANCE (Inspect applied sealants) *(STS: A2.24.8)*	2b	113		8	105 100	2 2	12 11	25 22	39 35	27 24	87
84. INTEGRAL FUEL TANK MAINTENANCE (Make temporary repairs) *(STS: A2.24.9)*	3b	113		9	104 100	3 3	16 14	20 18	34 30	31 27	57
85. FUEL CELLS (Remove/Install fuel cells) *(STS: A2.25.4)*	3b	113	10	8	95 91	6 5	8 7	35 31	33 29	13 12	41
86. FUEL CELLS (Repair fuel cells) *(STS: A2.25.5)*	2b	113	19	24	70 83	5 4	12 11	23 20	26 23	4 4	85
87. FUEL CELLS (Inspect cell cavities) *(STS: A2.25.6)*	2b	113	9	8	96 92	3 3	10 9	31 27	38 34	14 12	88
88. FUEL CELLS (Inspect fuel cells) *(STS: A2.25.7)*	2b	113	9	9	95 92	4 4	12 11	32 28	31 27	16 14	85
89. FUEL CELLS (Test fuel cells) *(STS: A2.25.8)*	3b	113			87 100	5 6	9 10	37 43	21 24	15 17	41

% SATISFACTORY OR BETTER
 # OUTSTANDING
 # EXCELLENT
 # SATISFACTORY
 # MARGINAL
 # UNSATISFACTORY
 # RESPONDING

	PL	RE	NR	NO	PT	UN	MA	SA	EX	OU	%S +
90. Please indicate the OVERALL rating of the course.		108					10 9	50 47	40 37	8 7	91

AIRCRAFT FUEL SYSTEMS APPRENTICE
J3ABR2A634 001

Based on a return of 118 questionnaires from Supervisors of the Aircraft Fuel Systems Apprentice Course, the overall rating of the course is shown in **Figure 1.**

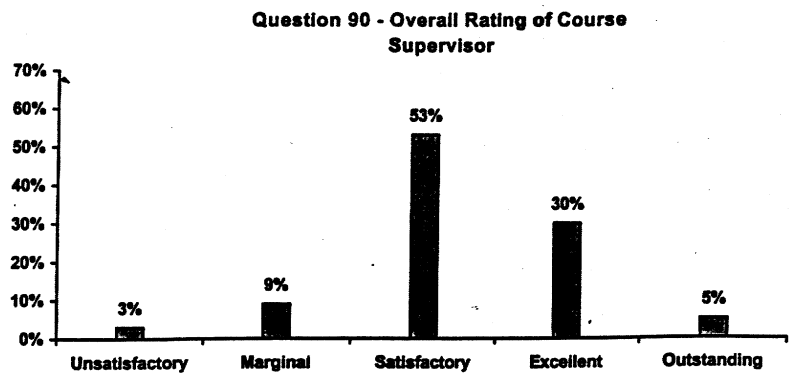

Figure 1.

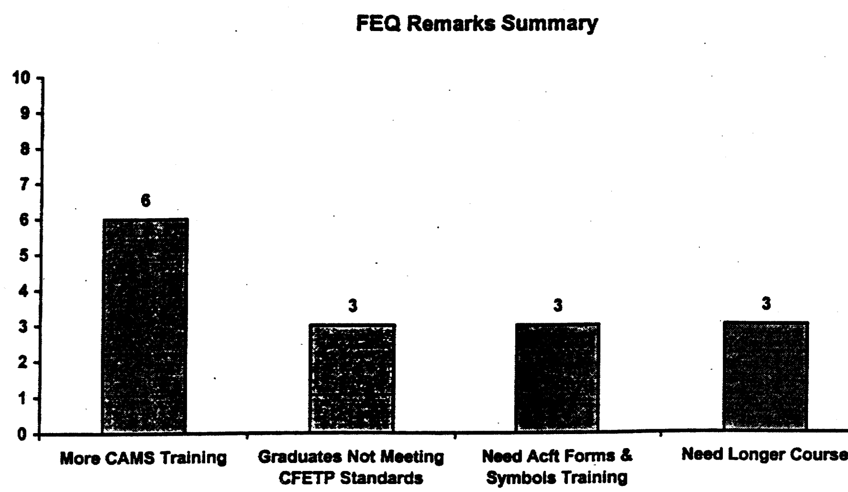

Figure 2.

Supervisor FEQS for course J3ABR2A634 001, Remarks Section III **(Figure 2)** included the following summary:

a. Supervisors stated that more CAMS training is needed.

b. Training is not meeting the training standards as specified in the CFETP.

c. More training is needed on aircraft forms and symbols.

d. Supervisors stated that the course needs to be longer.

e. Two supervisors stated that more aircraft specific training is needed.

f. Two supervisors stated that recent graduates lack initiative.

g. Two supervisors stated that more TO training is needed.

h. One supervisor stated that G081 training is needed.

i. One supervisor stated that more handtool training is needed.

j. One supervisor stated that additional confined space training is required.

Figures 3 and 4 show the statistics on the Specialty Training Standard tasks. **Figures 3 and 4** identify the question number and percentage unsatisfied with that task (task satisfaction below 85%).

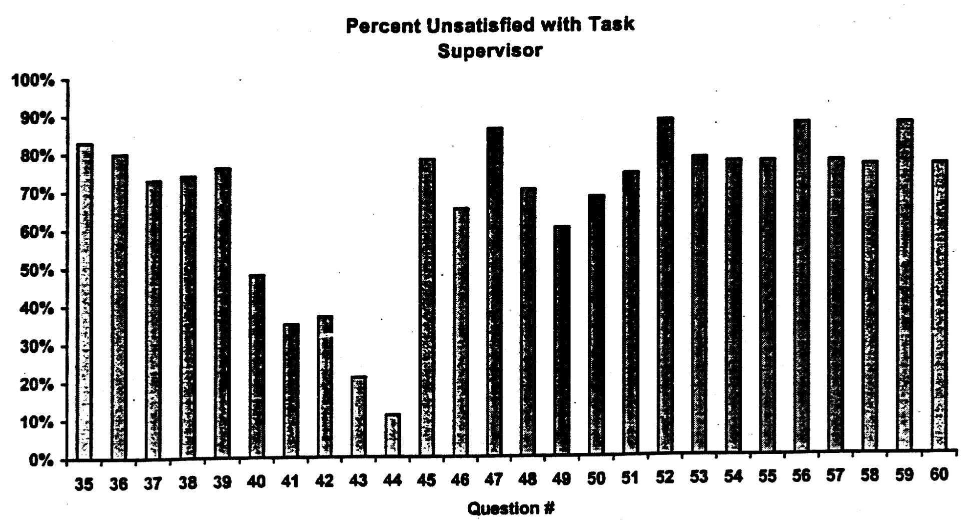

Figure 3.

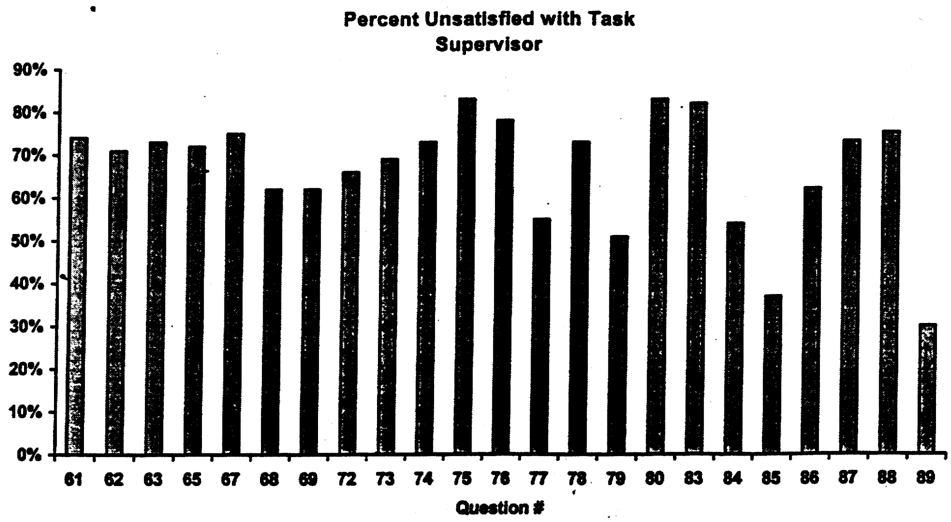

Figure 4.

The Graduates' overall rating of this course is shown in **Figure 5.**

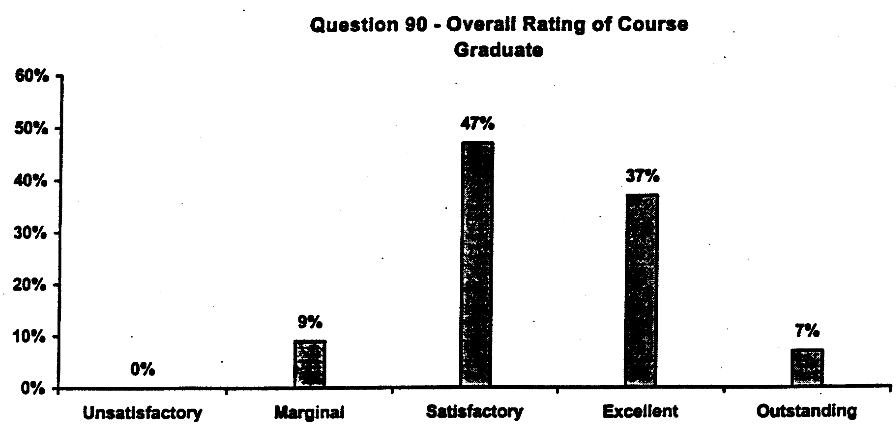

Figure 5

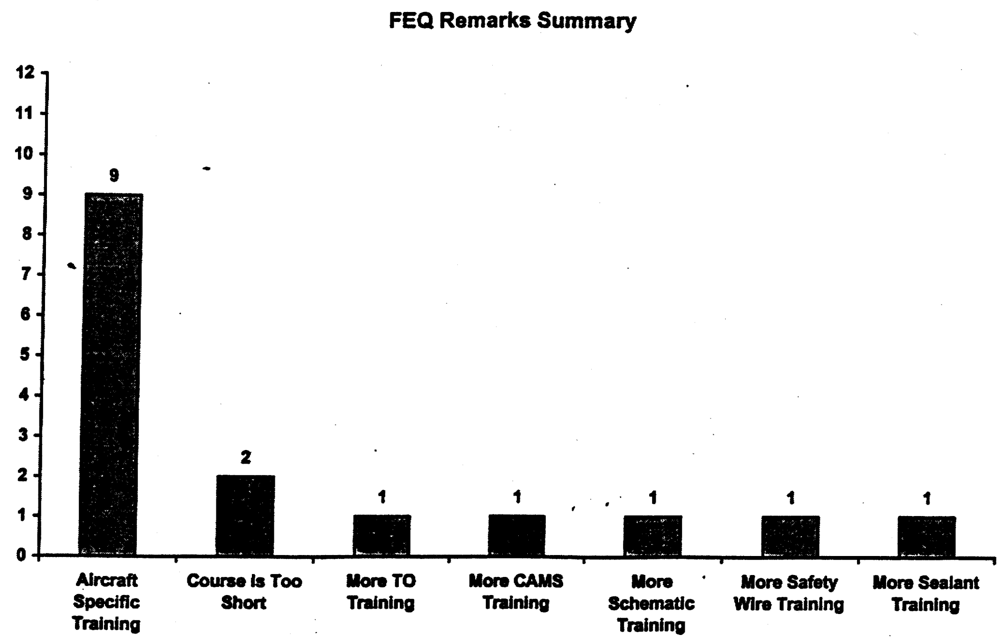

Figure 6.

Graduate FEQS for course J3ABR2A634 001, Remarks Section III (**Figure 6**) included the following summary:

a. Graduates stated that they need more aircraft specific training.

b. Graduates stated the course needs to be longer and more in-depth.

c. Graduate stated more TO training is needed.

d. Graduate stated that more CAMS training is needed.

e. Graduate stated that more training on schematics is needed.

f. Graduate stated that more safety wire training is needed.

g. Graduate stated the more sealant training is needed.

Figure 7 shows the statistics on the Specialty Training Standard tasks. **Figure 7** identifies the question number and percentage unsatisfied with that task (task satisfaction below 85%).

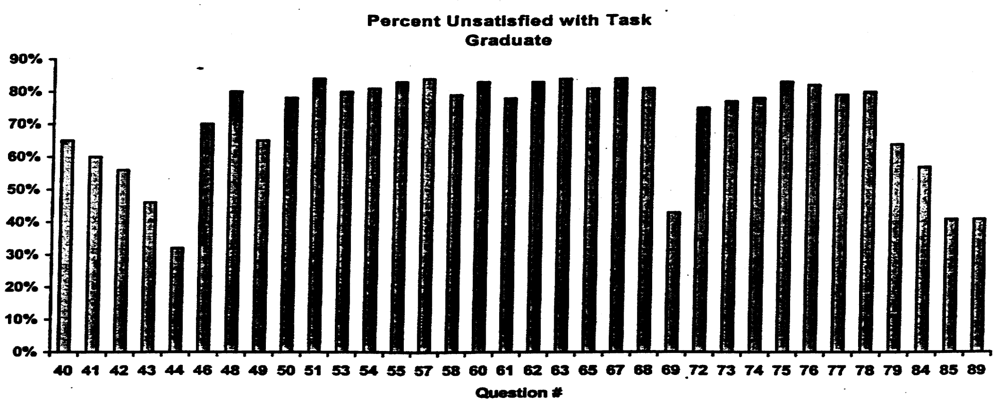

Figure 7.

APPENDIX D

APPLICATION AND APPROVAL FOR INVESTIGATION INVOLVING THE USE OF HUMAN SUBJECTS

APPLICATION FOR APPROVAL OF INVESTIGATION INVOLVING THE USE OF HUMAN SUBJECTS

University of North Texas Institutional review Board
for the Protection of Human Subjects in Research (IRB)

This application should be submitted to Research Services, Room 160, Administration Building.

1. Principal Investigator's Name: Steven W. Boyd

   Department & Campus Address:

   Campus Phone No.: 565-3 486 Home No.: (940) 691-5451
2. If you are a student, provide the following:

   Home address of Student: 2489 Wranglers Retreat, Wichita Falls, TX 76308 Name of Faculty Sponsor: Dr. Jeff Allen Phone Ext: 4918
   Is this your thesis or dissertation research? Yes _X_ No__

3. Title of Project: Using correlational analysis to determine the level the value of levels one and two evaluation

4. Total Project Period: _From: May 11, 1999_ To: July 9, 1999

5. Is a proposal for external support being submitted? Yes ______ No _X_

   If "Yes," you must submit one complete copy of that proposal as soon as it is available and complete the following:

   a) Is notification of Hum. Subj. Approval Required? Yes ______ No ______

   b) Is this a renewal application? Yes ______ No_______

   c) Funding agency's name: ____

6. In making this application, I certify that I have read and understand the guidelines and procedures developed by the University for the protection of human subjects, and I fully intend to comply with the letter and spirit of the University's Assurance and policy. I further acknowledge my responsibility to report any significant changes in the protocol, and to obtain written approval for these changes, in accordance with the procedures, prior to making these changes. I understand that I cannot initiate any contact with human subjects before I have received approval and /or complied with all contingencies made in connection with that approval.

   Signature of Principal Investigator Date

   ______________________________ ________May 12, 1999

7. Approval by Faculty Sponsor (required for all students): I affirm the accuracy of this application, and I accept the responsibility for the conduct of this research and supervision of human subjects as required by law.

   Signature of Faculty Sponsor Date

   ______________________________ ________________

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8. I have included copies of all pertinent attachments including, but not limited to: questionnaire/survey instrument, informed consent, letters of approval from cooperating institutions, copy of external major support proposal if applicable, etc.....

   Yes _X_ No______ (If no, explain on an attached sheet)

   For the following items, attach your answers, appropriately numbered on a separate sheet of paper.

9. Identify the sources of the potential subjects, derived materials or data. Describe the characteristics of the subject population, such as their anticipated number, age, sex, ethnic background, and state of health. Identify the criteria for inclusion or exclusion. Explain the rationale for the use of the special classes of subject, such as fetuses, pregnant women, children, institutionalized mentally disabled, prisoners, or others, especially those whose ability to give voluntary informed consent may be in question.

10. Provide a description of the procedures to be used in the study including hypotheses and description of the research design.

11. Describe the recruitment and consent procedures to be followed, including the circumstances under which consent will be solicited and obtained, who will seek it, the nature of information to be provided to prospective subjects, and the methods of documenting consent. (Include applicable consent form(s) for review purposes). If written consent is not be obtained, specifically point this out and explain why not.

    (Note: Informed consent must normally be obtained in a written form which requires the subject's signature or that of the subject's legally authorized representative. A waiver of this requirement may be granted by the IRAB if adequate justification for the requirement is provided by the investigator in #11. However, if the procedures pose no more that minimal risk to the subjects, informed consent may be documented via a written cover letter which does not require the subject's signature. **In all cases, a copy of the written informed consent myst be give to the subjects**. Consult the document "Information on Human Subjects Research" for more information on informed consent requirements and specific examples of possible informed consent documents.)

12. Include a discussion of confidentiality safeguards, where relevant.

13. Describe the anticipated benefits to subjects, and the importance of the knowledge that may reasonably be expected to result.

14. Describe the risks involved with these procedures (physical, psychological, and/or social) and the precautions you have taken to minimize these risks. Do the benefits described above outweigh the described risks?

University of North Texas
Research Services

May 18, 1999

Steven Boyd
2489 Wranglers Retreat Rd.
Wichita Falls, TX 76308

RE: IRB Application No. 99-103

Dear Mr. Boyd:

Your proposal entitled "Assessing the Ability of Reaction and Learning to Predict Job Performance," has been approved by the Institutional Review Board and is exempt from further review under 45CFR 46.101.

The UNT IRB must re-review this project prior to any modifications you make in the approved project. Please contact me if you wish to make such changes or need additional information.

Sincerely,

Sandra L. Terrell

Sandra L. Terrell, Chair
Institutional Review Board

ST:sb

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