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The purpose of this report was to (1) evaluate the training progress of Enlisted Personnel Individualized Career System (EPICS) personnel (N = 146) who had completed their first shipboard and shore-based training phases and (2) assess the instructional and administrative characteristics of these first two EPICS training phases. The ship operational schedule, shipboard interruptions during study, and the nonrated status of the EPICS personnel tended to increase shipboard training completion times while encouragement and guidance from senior personnel tended to decrease them. The instructional characteristics of the shipboard modules were rated very highly and administration of the shipboard training was not perceived as time consuming. General aptitude, eligibility for fire control technician (FT) training, and equipment technician training (ETT) preparation were the strongest factors influencing instructional progress of EPICS personnel during ETT, the first shore-based training phase. EPICS FT-eligible personnel progressed faster than their basic electricity and electronics (BE&E) counterparts, while the EPICS FT-ineligible group progressed at a rate representative of their status. Recommendations address methods for improving the shipboard and shore-based administration of EPICS.

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**NAVY PERSONNEL RESEARCH
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ENLISTED PERSONNEL INDIVIDUALIZED CAREER SYSTEM (EPICS): TEST AND EVALUATION OF FIRST SHIPBOARD AND SHORE-BASED TRAINING PHASES

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FOREWORD

This study was conducted under advanced development task area Z0828-PN, Enlisted Personnel Individualized Career System (EPICS) and was sponsored by the Deputy Chief of Naval Operations (OP-01). The EPICS program, which was designed using a systems approach, delays formal shore-based training until personnel have completed the first phase of a shipboard training program complemented with job performance aids (JPAs). Subsequent shore-based training phases are distributed and integrated with shipboard duty phases to provide a continuum of skill development experiences.

Early EPICS development phases including career system development, JPA technology refinement, and fleet implementation planning have been described in a series of Center reports (TRs 77-33, 78-26, and 79-25; SRs 83-32 and 83-39, TNs 79-1 and 80-14). TR 84-15 describes EPICS in detail, SR 83-23 compares training and ancillary costs, and TR 84-16 presents preliminary results of test and evaluation after 18 months. Additional Navy Personnel Research and Development Center technical reports will address the EPICS instructional systems development and the acceptance and use of JPAs.

This report presents findings from an evaluation of the first shipboard and shore-based training phases of EPICS, which assessed EPICS personnel instructional progress, school attrition, perceptions of the shipboard and resident training curriculum, and comparisons with conventional personnel. Recommendations focus on enhancing the effectiveness of these early EPICS training phases (i.e., formative evaluation).

This report is intended for use in future development and implementation of enlisted career programs and training.

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SUMMARY

Problem and Background

Current approaches to Navy technical training have centered around recruits attending technical training schools before they go to sea. Futhermore, eligibility for technical ratings is determined mostly by composite aptitude scores that predict academic performance in the technical schools, but are indirectly related to job performance. The Enlisted Personnel Individualized Career System (EPICS) was developed as an alternative configuration to front-end training and includes broadened personnel eligibility criteria. EPICS balanced job design, job performance aiding, several standardized shipboard training phases, practical job experience, and deferred, distributed shore-based school episodes to develop an integrated career system.

Objective

The EPICS project has completed a longitudinal test and evaluation in the fleet. This report evaluates the degree to which EPICS personnel completed their first shipboard and shore-based training phases and assesses the instructional and administrative characteristics of the first two EPICS training phases.

Approach

The subjects of the first EPICS shipboard training phase were 146 seaman recruits who reported to the NATO Seasparrow Surface Missile System (NSSMS) work centers aboard 30 Spruance class destroyers and 4 aircraft carriers equally divided between the Atlantic and Pacific fleets from September 1980 to December 1981. According to their composite aptitude test scores, nearly half these EPICS personnel were ineligible for technical training in the fire control technician (FT) (redesignated FC as of July 1985) rating. Participation rates, amount of shipboard instructional material completed, and time required to complete the material were used to assess EPICS personnel progress. Perceptions of the instructional and administrative characteristics were collected from feedback surveys and interviews with EPICS personnel, their EPICS shipboard administrators (ESAs), and their NSSMS co-workers.

The attrition and progress of 112 EPICS personnel who attended equipment technician training (ETT)--the first shore-based training phase--was assessed in terms of FT eligibility, general aptitude, shipboard preparation, and fleet assignment, and compared with the progress rates of gunner's mate (GM) and FT track basic electricity and electronics (BE&E) school graduates.

Results and Discussion

There were no statistically reliable differences between instructional progress of the FT-eligibility groups through any of the shipboard module series. Shipboard time prior to ETT averaged 15 months with 12 percent more FT eligibles than FT ineligibles completing all the shipboard modules. EPICS personnel and ESAs emphasized that shipboard evolutions and the nonrated status of EPICS personnel negatively affected shipboard study and that the ESA collateral duty was not overly time consuming. In addition, both groups rated the shipboard instructional materials highly, but indicated storage space could sometimes be a problem.

Comparisons between GM- and FT-track graduates of BE&E school in terms of school progress indicated that the EPICS FT-eligible group required consistently less time, the EPICS FT-ineligible group required slightly more time. Overall, only 12 percent of the ETT students completed the coursework in school. An additional 49 percent subsequently completed the ETT coursework aboard ship for a total graduation rate of 61 percent.

Twice as many EPICS personnel indicated they could apply little of the knowledge from ETT as those who said they could apply much of it. Roughly one out of every three ESAs and NSSMS co-workers believed the ETT attendees' troubleshooting ability had increased to a great extent and that they could perform more complex maintenance to a great extent. In open-ended feedback survey items and interviews, EPICS personnel and ESAs recommended extending ETT because subsequently completing the ETT modules aboard ship was difficult. They also noted that school attendance did not affect the NSSMS work center's ability to perform maintenance on the equipment, but did reduce the work center's ability to perform collateral duties.

Conclusions

If conditions in future implementations approximate those encountered during the EPICS test and evaluation, personnel will need more time than originally anticipated to complete the first shipboard training phase. Operational schedule of the ship, interruptions during study, and the nonrated status of the EPICS personnel tended to lengthen completion times while encouragement and guidance from senior personnel tended to shorten them. FT eligibility was not strongly related to shipboard training completion rates.

General aptitude, FT eligibility, and ETT preparation were the strongest factors influencing instructional progress of EPICS personnel during ETT. The combination of ETT length and content decreased the probability that EPICS personnel would graduate at the end of the shore-based period. EPICS FT-eligible personnel progressed faster than did their BE&E counterparts while the FT-ineligible group progressed at a rate representative of their status. ETT attendance improved the confidence of shipboard supervisors and increased the test equipment skills of EPICS personnel, but not the system-specific knowledge necessary to perform complex fault isolation or maintenance. Feedback survey and interview results suggest that the Naval Training Center make some changes to accommodate fleet returnees and that ship operations were rarely taken into consideration when scheduling ETT attendance.

Recommendations

1. The enrollment and academic progress of FT ineligibles who are in mental category IIIa should be studied in place of the IIIb personnel enrolled for the EPICS T&E.

2. The relevance to the job being performed at the first shipboard duty assignment of the shipboard instructional modules should be reviewed.

3. Alternative materials and methods of shipboard module protection and storage should be investigated.

4. The interaction between the ship's operational schedule and shipboard study should be investigated to provide guidelines for ESAs.

5. The development and application of an ESA indoctrination videotape should be explored.

6. The individualized, self-paced characteristics of EPICS first shipboard training phase should be reexamined in view of the wide range of instructional progress across individuals and ships.

7. ETT attendees should be required to complete all ETT-preparation modules and stricter academic testing standards should be instituted for these modules.

8. Review the structure and content of ETT. Any review of the instructional content must determine if ETT is intended to prepare the individual for further electronics training or for the job requirements of the next shipboard duty assignment. A functional context training (FCT) approach should be considered in any redesign effort.

9. The apparent mismatch between fleet returnees and the current ETT school setting at NTC should be reduced.

10. Guidelines that consider the impact of ship/school rotations on work center functioning, ETT preparation, application of ETT knowledge, and time in service should be developed.

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INTRODUCTION

Problem

Formal, shore-based training is an important method of teaching technical skills to personnel in the advanced electronics fields. Current approaches, however, focus only on front-end technical schools with little consideration of alternatives. No systematic effort to design and test more cost-effective training configurations integrating job performance aiding, standardized shipboard training programs, job design, practical job experience, and deferred, distributed shore-based training episodes has been attempted before Enlisted Personnel Individualized Career System (EPICS). Furthermore, eligibility for technical ratings has been based on composite aptitude scores predicting academic success in the technical schools and not on job performance or suitability criteria. The feasibility of screening and training lesser-aptitude personnel to perform successfully in technical ratings and offset potential shortfalls in high-aptitude recruitments has only been explored within the front-end school framework.

EPICS was developed, tested, and evaluated to determine if it could provide an alternative to front-end training with broadened personnel eligibility criteria. An integrated personnel systems approach (IPSA) was employed to develop EPICS, which attempts to reduce training costs by deferring expensive shore-based training. EPICS provides apprentice personnel with on-the-job experience, complemented with job performance aids (JPAs) and self-paced instructional materials. After the apprentice personnel have completed apprentice technician duty (ATD) and demonstrated satisfactory job performance to their supervisors, they are sent to shore-based equipment technician training (ETT) and, eventually, to system technician training during their enlistment. Thus, the EPICS program integrates technical progress, shipboard adjustment, and educational opportunities into an individualized career path. The implemented EPICS model currently being evaluated was described in detail by Blanchard, Smillie, and Conner (1984). The approach taken to test and evaluate EPICS and the interim results were reported by Blanchard, Clelland, and Megrditchian (1984).

Objectives

The EPICS project is currently undergoing a longitudinal test and evaluation (T&E) in the fleet. The major goal of this T&E is to assess overall cost and effectiveness of the various initiatives and approaches comprising EPICS and appraise the value of EPICS as an alternative to the conventional career system for the fire control technician (FT) (redesignated as FC as of July 1985) occupational specialty.

For the first shipboard training phase, the specific T&E objectives assessed in this report were to:

1. Investigate any differences in the instructional progress and completion rates associated with participants' eligibility for FT school and the shipboard training environment.

2. Determine the average time taken to complete the first shipboard training phase.

3. To assess participants' perceptions of administrative requirements, job relevance, and instructional modules.

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For the first shore-based training phase--ETT--the specific T&E objectives were to:

1.   Examine the influence of FT-school eligibility, general aptitude, and degree of shipboard instructional preparation on school progress and completion.

2.   Compare the instructional progress of ETT students with that of basic electricity and electronics (BE&E) school students.

3.   Determine the perceptions of job knowledge transfer of participants and EPICS shipboard administrators (ESAs).

Background

Military training research has generally concentrated on instructional technology (Kochevar, Erickson, Kramm, Briggs, & Hirshfeld, 1981), although related research and development in the Navy has also expanded to apply systems concepts and develop a comprehensive instructional systems development (ISD) model and applications (Montague & Wulfeck, 1982). However, while the ISD model addresses many of the tradeoffs in designing instructional delivery systems, alternative configurations to front-end loading of shore-based schools such as EPICS have not been systematically investigated.

Some earlier studies, though not specifically applicable to EPICS, are relevant to the issue of alternative training configurations. Lecznar (1972), for example, examined the differences between lower-aptitude airmen in Project 100,000 who were assigned to one of eight specialties either following graduation from front-end loaded training schools or as on-the-job (OJT) trainees. Both groups performed similarly on six criterion measures: (1) job difficulty, (2) average task difficulty, (3) number of tasks performed, (4) job interest, (5) perceived utilization of talent and training, and (6) overall performance ratings. These results supported a prior analysis of a similar group of airmen (Black & Bottenberg, 1970) that found "inconclusive evidence for any advantage for technical training over OJT when comparing how rapidly groups achieve the five-skill level" (p. 9). In addition, Dunham (1972) found OJT for an Air Force specialty cost considerably less and produced trained personnel in less time than did formal school training. Other studies (Arzigian, 1967; DETEC, 1981) have pointed out, however, that OJT costing methodology is subject to many constraints and is not fully developed. Lecznar (1972) cautioned that factors other than cost and time must be considered before complete displacement of formal technical training was advocated. For example, further research is needed to determine if the greater job-related content of formal OJT has long-term advantages over resident technical training. Shore-based schools have the advantage of being able to react rapidly to meet sudden increases in student input demand whereas such an imposition on an OJT program may impair the operational unit.

In addition to consideration of these training configuration tradeoffs during the design of EPICS, the projected reduction in the enlistable population through the 1980s (Fernandez, 1979) indicated a need to develop new methods to provide adequate manning levels. One potential personnel resource for the critical technical ratings were individuals whose composite aptitude score had categorized them as ineligible for technical ratings. Prior to the EPICS project, Bilinski, Standlee, and Saylor (1974) compared the school performance of "A" school eligible, nonminority ineligible (five points below cut-off score), and minority ineligible student groups. The eligible students faired better on the criteria of number of setbacks, amount of remediation, disciplinary actions, and attrition from "A" school than did both the ineligible groups. Thirty-three percent of the ineligible students were dropped from "A" school as compared to 10 percent of the eligible group.

However, after six months of fleet experience, Bilinski and Standlee (1974) found essentially no differences between eligible and ineligible groups on supervisor ratings of general work aptitude, interest, and quality; specific work performance; predicted advancement; retention desirability; and disciplinary actions. Thus, after the screening in school, the "A" school eligible and ineligible graduates did not differ, at least for six months, in terms of fleet performance and adjustment. This suggested that personnel marginally ineligible for school appeared to be a potential source of technicians if an appropriate training configuration could adequately address the issue of school attrition.

EPICS includes a shipboard training program to assist both "A" school eligible and ineligible personnel improve their job skills, adapt to shipboard life, and prepare for the shore-based training phases. The lack of such standardized shipboard training programs had led Main, Abrams, Chiles, Flaningam, and Vorce (1978) to identify the factors that most influence the success of shipboard training and to implement and evaluate a program designed to meet the necessary criteria. Although data collection to determine existing types of shipboard training and environmental constraints and implementation of a pilot program was limited to aircraft carriers (Chiles, Abrams, Flaningam, & Vorce, 1981), their conclusions are relevant to other shipboard training. Interviews pointed out that operational commitments and physical conditions, such as little physical space for training or study and lots of noise aboard an aircraft carrier, create imposing problems for training. Shipboard training has traditionally received low priority. Most operational units have tried to accomplish it through informal OJT because of limited availability of instructors and trainees during the same time period, limited availability of equipment or other devices for training purposes, and limited resources for designing, developing, and updating job-related training materials.

On the other hand, pressure to reduce the length of shore-based schools continues despite complaints from the fleet that OJT often creates more work and interferes with other responsibilities. Many proposed shipboard training programs are too sophisticated, require extensive changes, and cost too much to implement. Main et al. (1978) also found that the dynamic nature of ship operations makes timing of shipboard training a critical factor that is often ignored. Shipboard training must be both job-relevant and adaptable to the changing demands placed on the ship. The authors also called for more exploration of alternative approaches that attempt to improve and trade off other personnel factors such as assignment, promotion, formal school, supply, and performance requirement policies.

A few research and development efforts have tried to circumvent many of these shipboard training issues. Dollard, Dixon, and McCann (1980) designed and pilot tested a self-paced, computer-instructed course for general damage control (GDC) as an alternative method of shipboard training and not as a part of an ongoing training development plan. The program's evaluation revealed operational problems because of competing demands from the shipboard environment. The original, self-paced course had a 10-percent completion rate. The tendency of students to use the training time as an excuse to escape other ship's work required command intervention. After course completion became a command requirement, the completion rate increased to 88 percent. This sudden surge in users as a result of the command requirement temporarily saturated the minicomputer managing the system. Graduates of the GDC course performed better on the GDC test than did personnel who completed the GDC course on their own or via "school call" sessions. Course management of this new method required less supervisory time, but required a fulltime senior individual to manage the computer and course progress. It was concluded that to be successful, this program required direct individual assignment, training and testing time allocated during regular working hours, and regular student progress reports distributed to the respective supervisors.

The EPICS program was intended to prepare personnel to become journeyman FTs for the NATO Seasparrow Surface Missile System (NSSMS). In an attempt to avoid the problems associated with prior shipboard training programs, EPICS integrated four major elements into a building block approach: (1) shipboard instructional modules, (2) practical job experience, (3) periodic resident school training, and (4) job performance aiding. In addition, shipboard administration requirements were designed to be kept to a minimum. Blanchard and Smillie (1980) and Blanchard, Smillie, and Conner (1984) describe these four EPICS elements in detail. This report will focus on the first phases of elements 1 and 3 and these are highlighted in Figure 1. Table 1 defines the related acronyms frequently used in the report.

First Shipboard Training Phase

The first shipboard training phase consisted of four series of instructional modules (Table 2) through which EPICS personnel progress. The ESA, who is usually the work center supervisor or leading petty officer (LPO), follows the guidelines in the EPICS administration guide (EAG). The EAG recommends the number of study hours per day for each module series, ship's schedule permitting, and outlines the approximate time-in-service milestones for each module series.

The primary intent of the first two module series is to facilitate the new recruits' adaptation to living and working aboard ship. The ship indoctrination (SI) modules familiarize the new recruits with the shipboard environment and introduce them to the hand tools commonly used aboard ship. The EAG recommends that the new recruits study six hours daily during the first week aboard to complete the five SI modules. The job indoctrination (JI) modules present information about safety, maintenance, and administrative procedures, special tools, and an introduction to the NSSMS equipment geography. The EAG recommends that recruits study two hours daily to complete the four JI modules in five to six months, which includes three months of mess cooking. Time in service after completing the JI modules is expected to be seven to eight months.

The ATD modules are the first modules targeted specifically at work related to the NSSMS. They introduce basic theory of operation, operator tasks, and apprentice level maintenance tasks. The ETT-preparation (ETT-P) modules are essentially the first 14 modules of the shore-based ETT school. They are the first theoretically oriented modules and do not relate directly to the work performed by apprentice EPICS technicians during the first shipboard training phase. The ETT-P modules are included in the first shipboard training phase to enable EPICS personnel to complete the equivalent of the BE&E course for electronics technicians (ET) during ETT. To complete both the ATD and ETT-P module series in four to five months, the EAG recommends two study hours daily. Thus, the total expected time in service for EPICS personnel to complete the first shipboard training phase and qualify for ETT is 11 to 13 months. It was anticipated that participants would be sent to shore-based ETT as soon as possible after completing the ETT-P module series.

The shipboard instructional modules were designed and developed with the knowledge that a wide range of aptitudes, shipboard constraints, and instructional support would influence the self-paced progress of EPICS personnel. To facilitate learning, the instructional material is presented in three alternative formats: (1) a summary, which is a condensed version of the main features of the instructional material; (2) a programmed instruction, which presents a detailed sequence of information followed by a question that is followed immediately by its answer; and (3) a narrative, which resembles textbook chapters. Each module also has a test and each series of modules has one or more comprehensive tests. Testing and remediation are ESA responsibilities according to the

EPICS Training Phases	Training Structure	Rating/NEC Attainment

Figure 1. Structure of EPICS training phases.
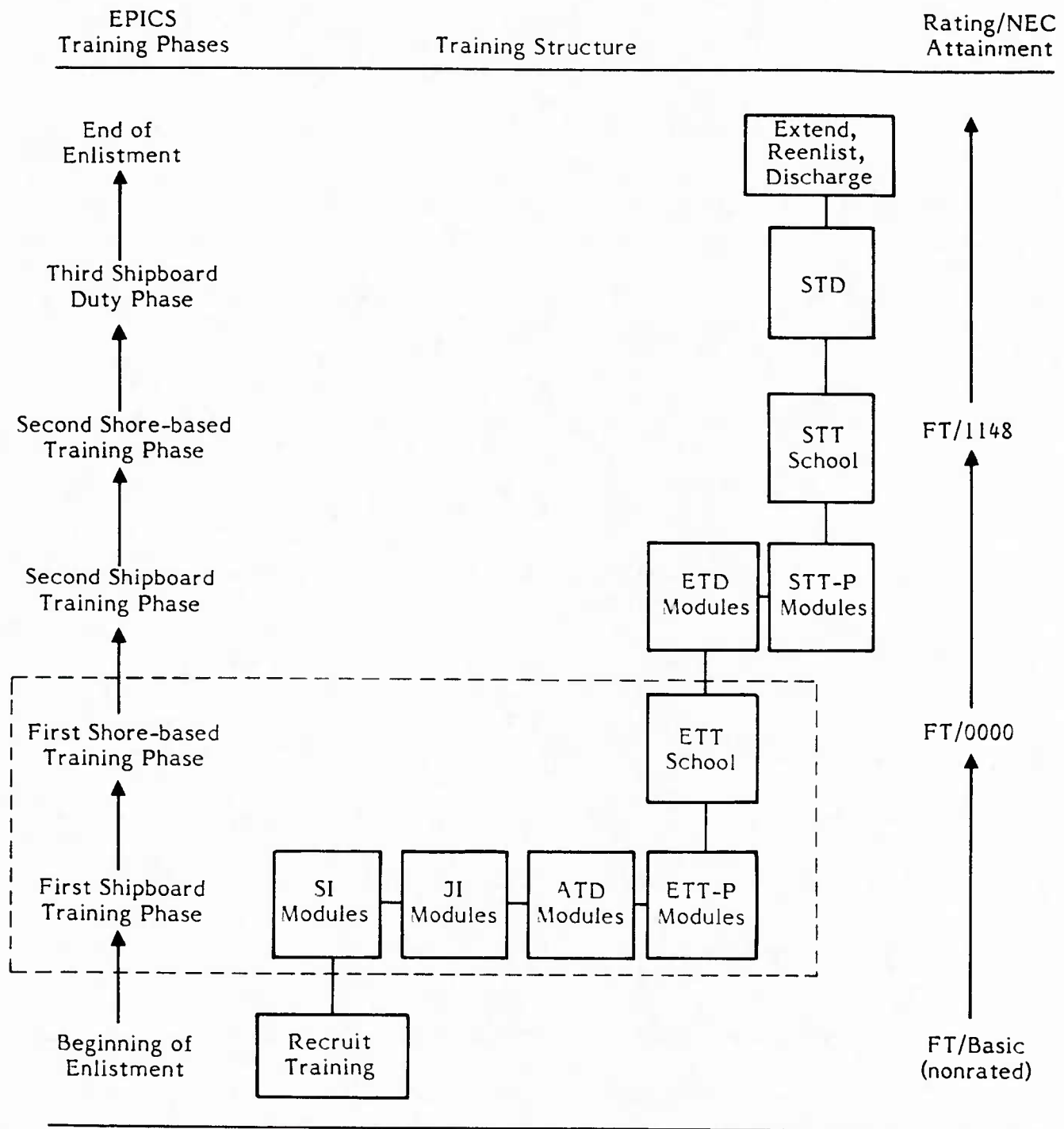
Notes. 1. STD = system technician duty; STT = system technician training; STT-P = STT-preparation; ETD = equipment technician duty; ETT = equipment technician training; ETT-P = ETT-preparation; ATD = apprentice technician duty; JI = job indoctrination; SI = ship indoctrination.

2. The dashed box encloses the EPICS training phases evaluated in this report.

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Table 1

Glossary of Acronyms

Acronym	Title	Description
ATD	Apprentice technician duty	Third shipboard instructional module series that introduces NSSMS operation and maintenance.
BE&E	Basic electricity and electronics school	First general electronics school that personnel in electronics-related ratings attend.
EAG	EPICS Administration Guide	Describes EPICS and lists the responsibilities of the EPICS shipboard administrator.
EPICS	Enlisted Personnel Individualized Career System	Alternative career system currently being tested with FTs assigned to the NSSMS.
ESA	EPICS shipboard administrator	Collateral duty assigned to a senior NSSMS work center petty officer (often the supervisor) in support of EPICS personnel.
ETT	Equipment technician training	First resident school EPICS personnel attend for general electronics instruction--the first shore-based training phase.
ETT-P	Equipment technician training-preparation	Last instructional module series of first shipboard training phase that prepares EPICS personnel for ETT.
FT	Fire control technician	Navy rating to which EPICS personnel were designated for the T&E.
GM	Gunner's mate	Navy rating that maintains launching subsystem of missile and gun systems.
ITB	Integrated training brigade	Military drill and practice for ETT and BE&E students.
JI	Job indoctrination	First shipboard training phase: Second module series that provides general job orientation for EPICS personnel.
NEC	Navy enlisted classification	Four digit code that indicates aptitudes and particular job skills of enlisted person.
NSSMS	NATO Seasparrow Surface Missile System	Improved point defense missile system that EPICS personnel were trained to maintain and operate.
NTC	Navy Training Center	Command where BE&E and ETT were conducted.
SI	Shipboard indoctrination	First EPICS shipboard instructional phase: First module series that introduces EPICS to shipboard life and organization.

Table 2

First Shipboard Training Phase: Instructional Modules

Module Series	Module Topics		Description
Ship indoctrination (SI)	1. 2. 3. 4. 5.	Ship locations, schedules, and procedures. Common shipboard hazards and safety precautions. Introduction to life aboard ship. Common requirements of maintenance personnel. U.S. Navy regulations, personnel improvement, and preliminary introduction to tools.	Provides "survival" information to aid new personnel entering shipboard life to adapt to the shipboard environment; to be completed during the first week aboard ship.
Job indoctrination (JI)	1. 2. 3. 4.	General safety procedures. General and special tools. Shipboard maintenance and record keeping. NATO Seasparrow Surface Missile System (NSSMS).	Introduces EPICS personnel to their department/division and provides survival information as they enter that department/division.
Apprentice technician duty (ATD)	1. 2. 3. 4. 5. 6.	Maintenance aids and documents. NSSMS functional review: Part 1. NSSMS functional review: Part 2. NSSMS operator training: Part 1. NSSMS operator training: Part 2. Test equipment operation.	Introduces EPICS personnel to the work center and to NSSMS, including theory of operation and operator training; provides information necessary to perform the first level of job performance aids (JPAs) developed for EPICS.
Equipment technician training-preparation (ETT-P)	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.	Basic voltage and current measurements in a simple circuit. Relationships of voltage, current, and resistance. Use of the Simpson 260-5P multimeter. Variational analyses of DC-series circuits. Parallel circuits. Combination DC circuits. Special DC circuits. Introduction to AC test equipment. Introduction to inductors. Transformer identification and operation. Introduction to capacitors and RC/RL time constants. RL and RC filters. Series resonant circuits. Parallel reactive circuits.	First 14 modules of the shore-based ETT school; introduces EPICS personnel to basic electricity and electronics and prepares them for ETT.

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guidelines in the EAG and these include setting the pass/remediate/fail test criteria. The EAG also lists the non-EPICS requirements that must be completed during the first shipboard phase to qualify for ETT.

Equipment Technician Training

This description of ETT characteristics will be jointly presented with BE&E characteristics because of their potential influence on evaluation measures of instructional progress. Table 3 presents the instructional content of ETT. The first four module series (1.0-34.0) represent the Electronics Technician (ET) track offered at BE&E. ETT has one additional, self-paced module series on digital fundamentals to enhance understanding of the NSSMS and later shipboard instructional materials. ETT lasts 14 weeks and is a variable-content/fixed-time school. The variable content aspect stems from the flexibility students have within the 14-week timeframe. That is, students who complete all the modules in less than 14 weeks can return to the ship earlier; and those who do not can complete them aboard ship after they return. In contrast, BE&E students complete a predetermined number of instructional modules that can be characterized as fixed-content/variable-time.

All of the ETT students came from the fleet while the BE&E students came almost entirely from the recruit training commands (RTC). The few BE&E students from the fleet were enrolled in the same carrel groups as the newly graduated recruits. All ETT and BE&E students participated in integrated training brigades (ITBs), which were established to maintain a disciplined environment in BE&E and "A" schools and thereby eliminate what had previously been perceived as a nonmilitary climate (Sagerholm, 1983). ITBs provide similar military drill and practice to that experienced by recruits in boot camp.

BE&E learning center instructors (LCIs) are E-5 to E-7s who serve a three-year tour at the school. LCI responsibilities include test administration, some classroom instruction, remediating and counseling slow students, enforcing disciplinary regulations, coordinating instructional materials, and monitoring the progress of a 30-student carrel group. The ETT LCIs were civilians who had previously been Navy LCIs at BE&E. The ETT LCIs had no collateral duties and were responsible for an EPICS-only 15-student carrel group.

The primary indicator of BE&E student academic progress is a comparison of predicted instructional progress--which is based on a validated formula including aptitude, demographics, and prior academic performance--with the actual progress on the most current module. A computer automatically makes these progress comparisons and reports them daily to the LCI and student. The net effect is a formula-predicted pacing of students. Thus, while progress differs for each student, students only partly control their progress.

ETT LCIs compared ETT students' progress with target completion dates based on the students finishing module 34.0 in 14 weeks. If, by week 12, an ETT student had made marginal progress towards completing the 30-series, the laboratory sessions were eliminated from later instructional material for acceleration purposes. This procedure is not used in BE&E; the formula-predicted pacing (just described) is employed to determine marginal or deficient progress. In both ETT and BE&E, the LCIs usually decide whether to send a student to the Academic Review Board (ARB) for academic or disciplinary reasons. The ARB makes the final recommendation to the command whether a student should receive further remediation or be dropped from the school.

Table 3

Equipment Technician Training (ETT): Instructional Content

Instructional Area	Module No.	Title
Basic electricity (ETT-P)	ETT 1.0	Basic voltage and current measurement in a simple circuit.
	ETT 2.0	Relationships of voltage, current, and resistance.
	ETT 3.0	Use of Simpson 260-5P multimeter.
	ETT 4.0	Variational analysis of DC series circuits.
	ETT 5.0	Parallel DC circuits.
	ETT 6.0	Combination DC circuits.
	ETT 7.0	Special DC circuits.
	ETT 8.0	Introduction to AC test equipment.
	ETT 9.0	Introduction to inductors.
	ETT 10.0	Transformer identification and operation.
	ETT 11.0	Introduction to capacitors and RC/RL time constants.
	ETT 12.0	RL and RC filters.
	ETT 13.0	Series resonant circuits.
	ETT 14.0	Parallel reactive circuits.
Basic troubleshooting	ETT 15.0	Soldering techniques.
	ETT 16.0	Introduction to operation and maintenance manuals.
	ETT 17.0	Basic oscilloscope operation.
	ETT 18.0	Basic troubleshooting techniques.
	ETT 19.0	Troubleshooting the amplifier stages in a radio receiver.
Basic electronics	ETT 20.0	Solid-state power supplies.
	ETT 20T.0	Electron-tube power supply.
	ETT 21.0	Basic transistor theory.
	ETT 21T.0	Multielement vacuum tubes.
	ETT 22.0	Oscillators.
	ETT 23.0	Multivibrators.
	ETT 24.0	Wave shaping guide.
	ETT 25.0	Special devices.
Intermediate electronics	ETT 30.0	Intermediate power supplies.
	ETT 31.0	RF, IF, and video amplifiers.
	ETT 32.0	Intermediate oscillators.
	ETT 33.0	Special devices.
	ETT 34.0	Linear integrated devices.
Digital fundamentals	ETT 40.0	Number systems.
	ETT 41.0	Basic digital logic.
	ETT 42.0	Boolean algebra.
	ETT 43.0	Registers and counters.
	ETT 44.0	Displays.

Notes.

1. Modules 1.0 through 14.0 are the last module series of the first shipboard training phase.

2. The 30 to 40 series of modules are available aboard ship for EPICS personnel who did not complete all modules within the 14-week period in San Diego.

METHOD

Table 4 links the primary hypotheses and questions with the respective variables and measures used to evaluate shipboard training phase and ETT. Most of the measures of academic progress are variants of time assessments (e.g., days, hours) because:

1. Academic proficiency is a prerequisite for instructional progress and the two measures would be highly correlated.

2. A major evaluation concern was the reliability of the EAG instructional timeline estimates given the dynamic shipboard environment and the degree of variability due to the "individualized" or self-pacing tenet of EPICS.

Subjects

The EPICS subjects of the first shipboard training phase were 146 seaman recruits who reported to the NSSMS work centers aboard 30 Spruance class destroyers and 4 aircraft carriers equally divided between the Atlantic and Pacific fleets from September 1980 to December 1981. Nearly half these EPICS personnel were ineligible for FT technical training according to their composite aptitude scores. Participants' eligibility for FT "A" school was based on a composite score of Armed Services Vocational Aptitude Battery (ASVAB) subtests (EI+MK+GS+AR) related to skills needed by FTs. Those scoring 218 or above were classified as FT eligible; those scoring below 218, as FT ineligible. Initial selection of EPICS personnel is described in a prior EPICS evaluation report (Blanchard, Clelland, & Megrditchian, 1984).

Of the 146 EPICS participants who initially reported for shipboard duty, 112 attended ETT. The other 34 attrited from the Navy, left the EPICS program (usually reassigned to the deck force), or remained with the NSSMS work center as apprentice technicians without ever attending a school. Figure 2 indicates FT-eligible and FT-ineligible group participation rates at each successive training milestone. It can be seen that more EPICS personnel attended ETT than completed any of the shipboard module series. During the first shipboard training phase, 33 EPICS participants were interviewed, shipboard instructional progress data were available for 103, and 60 responded to a survey.

During ETT, the instructional progress of the 112 students was monitored and recorded, and 111 responded to a survey. Six months after ETT, 28 of the 95 remaining EPICS participants responded to another survey. Eight to 14 months after ETT, 27 EPICS participants were interviewed about their use of school instruction. Table 5 summarizes five demographic variables for the initial EPICS cohort and for each of the respondent groups associated with each instrument except the interviews where these demographic data were not collected.

For comparison with EPICS ETT progress and attrition, similar data were collected for all gunner's mate (GM) (N = 348) and FT (N = 682) track BE&E students who attended the BE&E schools in San Diego and Great Lakes between June 1981 and January 1983. The data collection timeframe matched that of the ETT data collection period. The measures collected included predicted and observed number of study hours, calendar days, and extra study hours (i.e., study beyond normal class time); mental category; FT eligibility based on an ASVAB composite score; and attrition status. Naval Training Command (NTC), San Diego summarized the BE&E monthly student progress and reported the data as carrel group averages and aggregates; that is, no individual data were available. These group scores were then averaged across carrel groups for the assessment

Table 4

Hypotheses/Questions, Variables, and Measures: First Shipboard
Training Phase and Equipment Technician Training

Hypothesis/Question	Variable	Measure
First Shipboard Training Phase		
1. On the average, how long does it take EPICS personnel to complete each module series?	Dependent variable Study time Total calendar time	Number of days Days per module series
2. Are there any differences in instructional progress between the EPICS FT-eligible and FT-ineligible groups?	Independent variable FT eligibility Dependent variable Study time Total calendar time	ASVAB composite score Number of days Days per module series
3. What factors are related to the shipboard instructional progress of EPICS personnel?	Independent variable FT eligibility General aptitude Reading grade level Education Shipboard environment ESA support Dependent variable Study time Total calendar time	ASVAB composite score AFQT score Gates-McGinitie score Years of school Feedback survey items, interview questions Feedback survey items, interview questions Number of days Days per module series
4. Did the shipboard modules provide job-relevant information for EPICS personnel?	Dependent variable Knowledge transfer	Feedback survey items
5. Can the shipboard training program be administered as a collateral duty?	Dependent variable Administration requirements	Feedback survey items, interviews
6. How were the instructional characteristics of the modules perceived by EPICS personnel, ESAs, and NSSMS co-workers?	Dependent variable Instructional characteristics	Feedback survey items, interview
Equipment Technician Training		
1. The EPICS FT-ineligible and FT-eligible groups, on the average, will complete a similar number of ETT modules in school.	Independent variable FT eligibility Dependent variable ETT progress	ASVAB composite score Number of completed ETT modules
2. Significantly more ETT modules will be completed by EPICS personnel in school who have completed ETT-P modules 1-14. ETT progress ETT progress	Independent variable ETT preparation Dependent variable Number of completed ETT modules Number of completed ETT modules	Number of completed ETT modules
3. There will be a significantly positive relationship between number of ETT-P modules completed and ETT module progress. ETT progress	Independent variable ETT preparation Dependent variable Number of completed ETT modules	Number of completed ETT-P modules
4. The EPICS FT-eligible group will complete ETT modules 1-25 in less time, on the average, than will FT-track BE&E students.	Independent variable School type FT eligibility Dependent variable Course study time	School attendance ASVAB composite score Number of study hours, calendar days, extra study hours
5. The EPICS FT-ineligible group will complete modules 1-25 in a similar amount of time, on the average, as FT-track BE&E students.	Independent variable School type FT eligibility Dependent variable Course study time	School attendance ASVAB composite score Number of study hours, calendar days, extra study hours
6. What factors seem to account for the most variance in instructional progress of ETT students?	Independent variable FT eligibility General aptitude Reading grade level Fleet assignment ETT preparation Dependent variable Course study time	ASVAB composite score AFQT score Gates-McGinitie score Home-port coast Number of ETT-P modules Number of study hours, calendar days, extra study hours
7. How was ETT school perceived by EPICS personnel and ESAs?	Dependent variable School attributes Knowledge transfer	Feedback surveys, interviews

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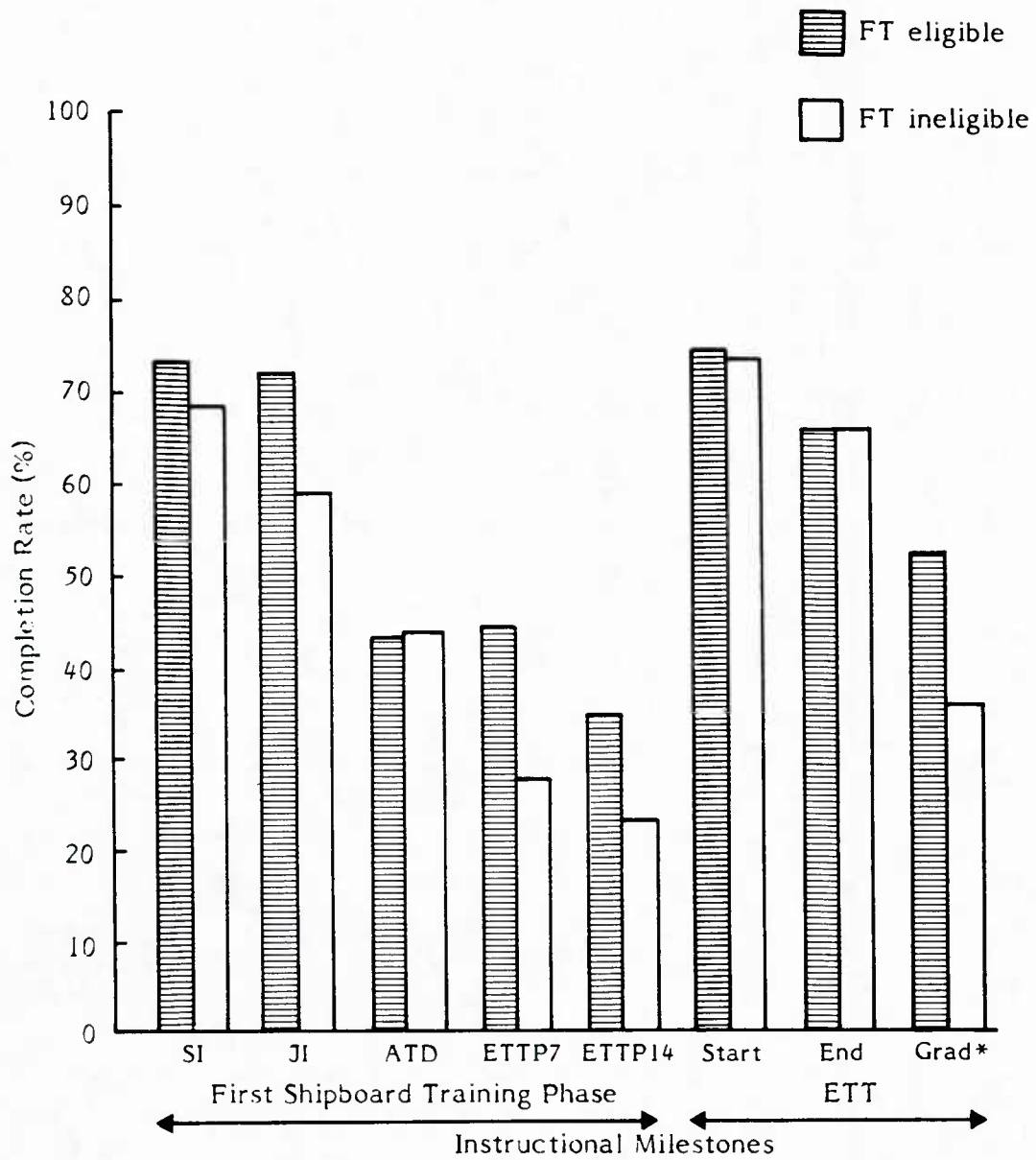
Figure 2.   Percentage of initial FT-eligible (N=75) and FT-ineligible
            (N=71) groups completing instructional milestones.

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Table 5

Demographic Characteristics for each EPICS Respondent Group

	AFQT Score		Reading Grade Level		Education (Years)		FT-eligibility Group[a]		Fleet	
Group	M	SD	M	SD	M	SD	E	I	A	P
Initial EPICS cohort (N = 146)	66	16.7	11	1.8	12	.9	51%	49%	49%	51%
Respondents										
EPICS shipboard participants (N = 103)	65	17.2	11	.8	12	.8	52%	48%	49%	51%
ETT students (N = 112)	65	17.2	11	.8	12	.8	52%	48%	49%	51%
EPICS feedback survey										
9 months[b] (N = 60)	62	16.0	10	2.0	12	1.0	42%	58%	47%	53%
15 months[b] (N = 111)	66	17.2	11	1.9	12	.8	51%	49%	49%	51%
25 months[b] (N = 28)	65	21.7	10	1.9	12	.9	57%	43%	54%	46%

Note: M = mean; SD = standard deviation; A = Atlantic Fleet; P = Pacific fleet.

[a] Eligibility for FT "A" school was based on ASVAB composite score: EI+MK+GS+AR=218. Those scoring 218 or higher were classified FT eligible = E and those scoring below 218 were classified as FT ineligible = I.

[b] Average shipboard time.

timeframe. Two comparison groups were used because only course completion data were available for the BE&E groups. Thus, progress data for the FT-track group were available for modules 1-25, but not for modules 1-11. According to the ASVAB composite scores that determine eligibility for each rating, 86 percent of the GMs and 96 percent of the FTs who attended BE&E were eligible for the school (i.e., entry requirements had not been waived).

Instruments

Table 6 presents the feedback survey and interview response rates for EPICS personnel, ESAs, and NSSMS co-workers by fleet assignment. Appendix A contains the instruments employed in this evaluation.

Table 6

EPICS Personnel, ESA, and NSSMS Co-worker Response Rates for each
Instrument and Respondent Group by Fleet

Instrument/Respondent Group	Responses			
			Fleet (%)	
	N	%	Atlantic	Pacific
Feedback Surveys				
EPICS personnel				
9 months (N = 125)	60	48	47	53
15 months (N = 112)	111	99	49	51
25 months (N = 95)	28	29	54	46
ESAs (N = 34)				
6 months	16	47	44	56
12 months	17	50	53	47
18 months	17	50	29	71
NSSMS co-workers (N = 110)				
12 months	75	68	47	53
18 months	36	33	66	34
Interviews				
EPICS personnel				
12-15 months (N = 112)	33	29	39	61
24-30 months (N = 95)	27	28	63	37
ESAs (N = 34)				
12-15 months	14	41	50	50
24-30 months	10	29	60	40

Note. Feedback survey and interview administration times for EPICS personnel indicate average time aboard the ship. The administration times for ESAs and NSSMS co-workers indicate average time after EPICS was implemented aboard the ship.

Feedback Surveys

Eight feedback surveys were developed and administered to EPICS sailors, ESAs, and NSSMS co-workers. Each survey included items addressing the shipboard instructional program during ATD and the shipboard instructional issues of material characteristics, study environment and support, administration, co-worker usage, and the job relevance of ETT. Responses to all survey items ranged from 1 (to a very little extent) to 5 (to a very great extent). Some open-ended questions solicited general comments about the first shipboard training phase or ETT. Table 5 indicates that most characteristics of the EPICS

feedback survey samples appear to be quite representative of initial EPICS cohort although FT ineligibles responding to the 9-month feedback survey were somewhat over-represented (58 vs. 42% for FT eligibles) relative to the initial EPICS cohort. Conversely, FT eligibles were somewhat over-represented in the 25-month feedback survey respondent group (57 vs. 43% for FT ineligibles). EPICS personnel received a survey 6 months after reporting aboard, at the start of each new ETT class, and 6 months after leaving ETT.

Although one petty officer in each NSSMS work center/division was assigned to be the ESA, a number of individuals rotated through this collateral duty over the course of the T&E. Thus, different individuals often responded to the three consecutive ESA feedback surveys. Each ESA response represents a ship. Of the 34 ESAs on participating ships, 16 completed the 6-month survey, 17 completed the 12-month survey, and 17 completed the 18-month survey. ESAs were generally petty officers second class in the FT rating serving their first enlistment.

NSSMS co-workers received a survey 12 and 18 months after the EPICS personnel had reported aboard. The first NSSMS co-worker feedback survey addressed the first shipboard training phase and the second included items relating to ETT. Seventy-five NSSMS co-workers responded to the 12-month feedback survey; and 36, to the 18-month feedback survey. The majority of the NSSMS co-workers were petty officers second class who had been in the Navy 3 or more years.

EPICS Career Management Form

A career management form was developed and included in the EAG to assist the ESAs in managing the shipboard instructional program and to provide evaluation data. The ESAs recorded the dates on which EPICS participants completed military requirements (e.g., personnel qualification standards (PQS)), advanced in military rate, started a module, passed an end-of-module test, and completed a comprehensive module series test. The data from this form were collected when the EPICS fleet representative visited the ship. As expected, ESAs varied in their application of the career management form, but a representative sample of EPICS personnel had their progress data recorded (see Table 5).

ETT Student Progress Form

Daily, weekly, and monthly computerized instructor logs of ETT progress provided the following data that were recorded on the ETT student progress form: (1) FT-eligibility score based on a composite of ASVAB subtest scores, (2) number of ETT-P modules completed aboard ship, (3) comprehensive electronics pretest score, (4) the number of days, normal study hours, and extra study hours to complete modules 1-11, 1-25, 1-34, and 1-44, (5) the total number of modules completed during the 14-week course, and (6) whether the individual attrited from ETT.

Interviews

A structured interview form was developed for use during shipboard sessions with EPICS personnel and their ESAs. These interviews addressed work center manning, general impressions of the EPICS program in the shipboard environment, ESA duties, EPICS fleet representative assistance, progression of duties on the job, and instructional modules, acceptance of JPAs and maintenance requirements cards (MRCs), program modification suggestions, and the impact of having personnel in an EPICS career path in the NSSMS work center. Only interview responses related to the EPICS shipboard training program or ETT will be reported here.

From December 1981 to March 1982 (12-15 months after implementation), 14 ESAs were interviewed; from December 1982 to March 1983 (24-30 months after implementation), 10 ESAs were interviewed. Table 6 reflects the differing ship availability that resulted in more personnel being interviewed from the Pacific fleet than the Atlantic fleet during the first set of interviews; and 26 percent more from the Atlantic fleet than the Pacific fleet during the second set of interviews.

Analysis

Shipboard Instructional Progress

The total number of calendar days and days EPICS personnel spent studying the modules was summarized for each shipboard module series and aggregated across each succession of module series. These data were also broken down by percentage of EPICS personnel completing each module series and graphically represented to indicate the time required to complete the first shipboard phase. In addition, the number of EPICS personnel aboard ship who completed the module series was also summarized. Pearson correlation coefficients were computed between demographic predictors and the criteria of instructional progress as measured in days.

ETT Progress

To determine the relationships between the demographic predictors and the numerous criteria of ETT progress, intercorrelation matrices were computed. Both demographic predictor and criterion data were summarized and broken down by number of ETT-P modules completed (i.e., none, 1-7, 8-14) and by FT eligibility. Differences between these groupings were investigated by t-tests, chi-square tests, and one-way analyses of variance (ANOVAs). To explore the relative strength of the predictor variables in accounting for variance in the criterion measures of instructional progress, a series of stepwise multiple regression analyses were conducted.

BE&E Comparisons

BE&E GM and FT track students, and EPICS ETT students were contrasted graphically on the average number of study hours required, calendar days taken, and extra study hours. BE&E GM track students completed modules 1-11 and the FT track students completed modules 1-25. The EPICS ETT students and two BE&E student groups studied the same module series. Statistical comparisons could not be conducted because BE&E data were summarized monthly and not reported individually.

Feedback Surveys

Response frequencies from ESAs and NSSMS co-workers feedback surveys were tabulated and descriptive statistics computed. EPICS personnel survey data were broken down by FT eligibility for each survey and t-tests were computed for each item. Responses of EPICS personnel and ESAs to open-ended questions pertaining to the shipboard instructional program or ETT were also summarized.

Interviews

Responses to questions for both sets of interviews were ranked according to frequency and broken down by respondent groups (ESAs, supervisors, and EPICS personnel).

RESULTS

<u>First Shipboard Training Phase</u>

<u>Instructional Progress</u>

Table 7 presents descriptive statistics summarizing the progress of the EPICS cohort made during the first shipboard training phase and the number of EPICS personnel who completed each module series. As complete data were not available for all individuals completing the module series, the ratio of the number of individuals with progress data to the number known to have completed the module series (i.e., "percent usable data") was computed.

Table 7

Descriptive Statistics for EPICS Shipboard Instructional Progress

	N			Time (days)		
Criteria[a]	Module[b] Completion	Progress[c] Data	Percent Usable Data	Median	Mean	SD
Study time on modules						
SI 1-5	103	103	100	20.0	36.3	49.16
JI 1-4	96	96	100	22.5	40.5	46.55
ATD 1-6	63	46	73	34.5	56.2	58.07
ETT-P (1-7)	54	29	54	44.2	58.1	54.92
ETT-P (8-14)	44	20	45	26.5	33.0	20.94
Total calendar time						
SI 1-5	103	103	100	26.4	48.9	55.69
JI 1-4	96	96	100	29.5	58.5	63.38
ATD 1-6	63	47	75	65.0	96.6	76.17
ETT-P (1-7)	54	29	54	71.0	85.2	64.80
ETT-P (8-14)	44	20	45	30.5	42.4	26.92
Cumulative calendar time						
SI 1 - JI 4	96	96	100	75.5	108.9	85.72
SI 1 - ATD 6	63	47	75	205.0	199.4	110.13
SI 1 - ETT-P (1-7)	54	23	43	282.0	285.4	139.12
SI 1 - ETT-P (1-14)	44	17	39	309.0	302.2	120.47

[a]Shipboard instructional module series: SI = ship indoctrination; JI = job indoctrination; ATD = apprentice technician duty; ETT-P = ETT preparation modules.

[b]Number of EPICS personnel known to have completed modules series.

[c]Number of EPICS personnel for whom modules series progress data were recorded.

The SI and JI series required the fewest median days of study whereas in comparison the first seven ETT-P modules required twice as many days of study time. EPICS personnel spent many more calendar days studying the SI, JI, and ETT-P modules than the ATD modules. However, they spent only about one half of this calendar time studying. The magnitude of the standard deviations reflect considerable variability in the number of calendar days to complete each module series. The median number of days to complete modules SI 1 through ATD 6 was 205 days (nearly 7 months) with 68 percent completing them between 89 and 309 days (3 and 10 months). The median calendar time taken to complete every module series for the first shipboard training phase was 309 days (about 10 months) with 68 percent completing them between 182 and 422 days (6 and 14 months). This wide variation in completion times indicates that a number of personal, organizational, or situational factors affect individual shipboard instructional progress. Given this range, the percentage of individuals completing each module series was plotted in Figure 3 to show the estimated length of study time required. Due to distortion of the completion rate function as a result of outliers at the extremes of the data distribution, the slowest and fastest 10 percent of the EPICS personnel are not included in Figures 3, 4, 5, and 6. The function plotted in Figure 4 depicts EPICS student flow in terms of module series completion times, time in service (total calendar months), and numbers of personnel qualifying for school attendance. For example, Figure 4 shows that it required 14 months for 70 percent of EPICS personnel to complete all modules through ETT-P 14. For an additional 20 percent of the EPICS personnel to complete the same number of modules would require eight additional months, which might be unacceptable as they might also be academically marginal.

Figure 7 is a plot of the shipboard time by completion rate for the FT-eligible and FT-ineligible groups. For the ATD and ETT-P module series, the initial two thirds of the FT-eligible group were slightly faster than the initial two thirds of the FT-eligible group with the reverse for the slowest one third of each group.

Figures 5 and 6 present the study time per module series and total calendar time respectively for the FT-eligible and FT-ineligible groups. Both groups required a similar amount of time to complete all of the module series except ETT-P modules 1-7, which are the first modules that require some electronics aptitude. The FT-ineligible group took much longer to complete these first seven ETT-P modules; however, t-tests contrasting the eligibility groups for each module series indicate that the ETT-P modules 1-7 study time and total calendar time differences were not statistically reliable.

Only two of the Pearson correlations computed between demographic predictors and criterion measures of shipboard instructional progress were statistically reliable: education level with study time ($r = .58$, $p < .001$) and the total calendar time ($r = .53$, $p < .001$) to complete ETT-P modules 8-14. However, the highly select sample ($N = 20$) who completed ETT-P module 8-14 make interpretation difficult.

Feedback Survey Responses

EPICS Personnel. Table 8 summarizes the EPICS personnel's responses to feedback survey items addressing the shipboard instructional program. The upper and lower response categories have been collapsed to facilitate interpretation. Because t-tests computed for each item indicated that EPICS FT-eligible and FT-ineligible responses were not reliably different for any of the items, their responses have been aggregated in Table 8.

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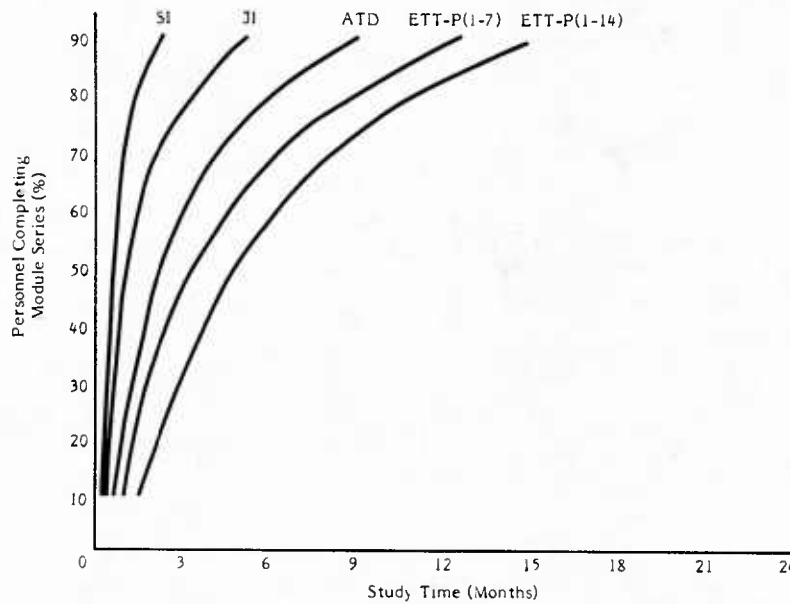
Figure 3. Percent of EPICS personnel completing each module series of first shipboard training phase by shipboard study time.
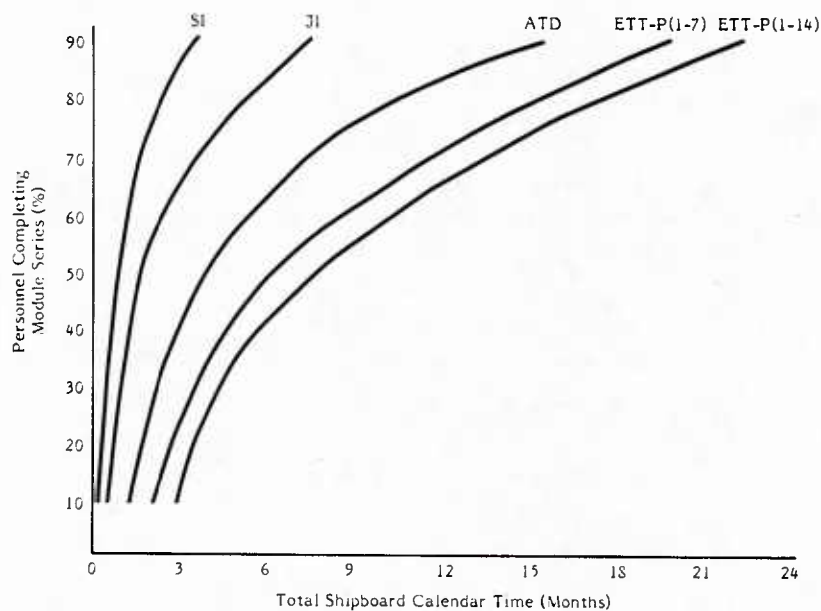
Figure 4. Percent of EPICS personnel completing module series of first shipboard training phase by total shipboard calendar time.
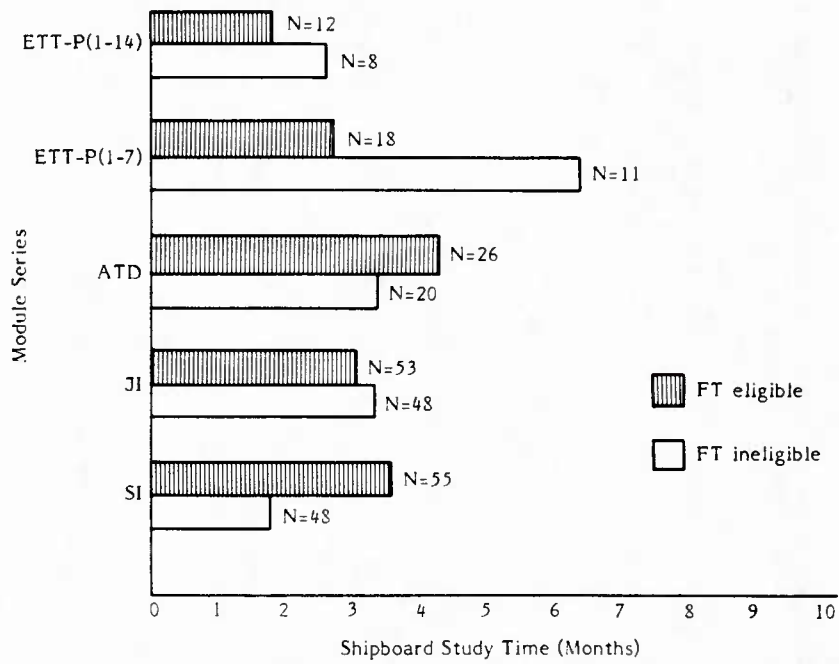
Figure 5. Average shipboard study time for EPICS FT eligibles and FT ineligibles completing module series.
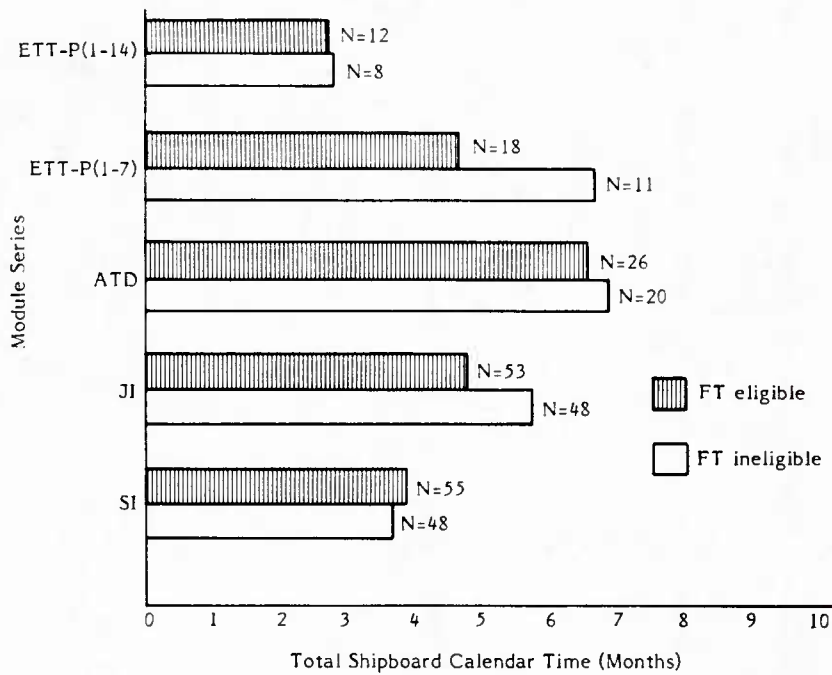
Figure 6. Average total shipboard calendar time for EPICS FT eligibles and FT ineligibles completing module series.

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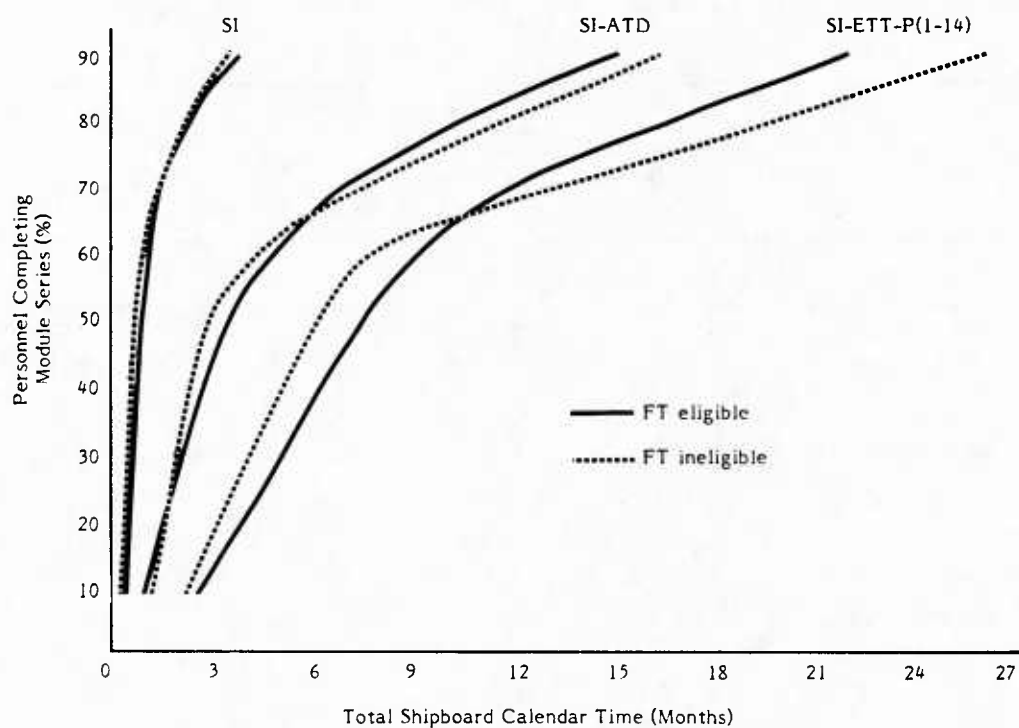
Figure 7. Percent of EPICS FT eligibles (E) and FT ineligibles (I) completing module series SI (E=55, I=48), SI through ATD (E=26, I=20), and SI through ETT-P(1-14) (E=12, I=8) by total shipboard calendar time.

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Table 8

EPICS Personnel Feedback Survey:
Responses After 9 and 15 Months Aboard Ship

Item[a]	Average Shipboard Time (mos.)	Response Category (%)[b]			N	Mean[c]
		Very Little or Little	Some	Great or Very Great		
Instructional Characteristics						
Are there errors in your instructional modules?	9	16	31	54	59	3.6
	15	32	45	23	111	2.9
Are the instructional modules too repetitive?	9	50	27	23	59	2.7
	15	--	--	--	--	--
Do the modules go into enough detail?	9	8	39	52	59	3.6
	15	5	45	51	110	3.6
Do the module tests measure your knowledge?	9	15	47	37	59	3.2
	15	17	50	34	110	3.2
Are the instructional modules difficult to read?	9	90	10	--	59	1.5
	15	86	11	3	110	1.7
Is it clear what you are supposed to learn from the instructional modules?	9	4	20	75	59	4.0
	15	4	23	74	111	3.8
Did you have to repeat modules in order to pass them?	9	87	10	3	59	1.5
	15	--	--	--	--	--
Do the modules require reasonable standards of performance?	9	11	53	37	57	3.3
	15	8	47	45	109	3.4
Shipboard Study Environment						
Do you have adequate storage space for your instructional modules?	9	12	24	64	59	3.7
	15	--	--	--	--	--
Is your study area poorly lit?	9	78	15	7	59	1.7
	15	--	--	--	--	--
Do you have a good place to study your modules?	9	24	36	41	59	3.2
	15	--	--	--	--	--
Is your study area too noisy?	9	48	32	20	59	2.5
	15	45	32	23	111	2.7

[a]Every question started with, "To what extent..."

[b]Percentages do not always sum to 100 due to rounding.

[c]Means are based on a 5-point response scale, where 1 = very little and 5 = very great.

Table 8 (Continued)

Item[a]	Average Shipboard Time (mos.)	Response Category (%)[b]			N	Mean[c]
		Very Little or Little	Some	Great or Very Great		
Shipboard Study Environment (Continued)						
Are you interrupted when studying your modules?	9	29	37	34	59	3.1
	15	--	--	--	--	--
Are you able to study often enough?	9	32	31	38	59	3.0
	15	--	--	--	--	--
Do you have adequate time to complete the modules at your own pace?	9	15	29	56	59	3.6
	15	15	34	50	111	3.4
Job Knowledge Transfer						
Have the modules prepared you for advancement-in-rate?	9	24	47	28	59	3.1
	15	23	53	24	111	2.9
Are the modules helping you to complete your PQS for the NSSMS?	9	24	29	47	59	3.6
	15	10	45	44	111	3.3
Are you learning job skills from studying the modules on your own?	9	--	--	--	--	--
	15	13	51	37	110	3.3
Administration						
Do you experience delays in getting your comprehensive tests scored?	9	68	22	10	59	2.0
	15	62	24	14	111	2.2

[a]Every question started with, "To what extent. . ."

[b]Percentages do not always sum to 100 due to rounding.

[c]Means are based on a 5-point response scale, where 1 = very little and 5 = very great.

When EPICS personnel completed the JI modules after an average of 9 months at sea, 54 percent had found errors from a great to a very great extent in the instructional modules (see Table 8); however, at the end of the first shipboard training phase after an average of 15 months at sea, only 23 percent found errors. Only 23 percent considered the instructional modules overly repetitive; more than half judged the modules to contain enough detail. From 75 to 90 percent considered the modules easy to read and reasonably explicit in terms of learning objectives. Most EPICS personnel (87%) indicated that they rarely had to repeat modules for successful completion.

In terms of the shipboard study environment, 64 percent of EPICS personnel had adequate storage space for the modules and only 7 percent had poor lighting in their study area. There was a fairly even distribution of responses in reference to finding a place on the ship to study; some found this more difficult than others. Few respondents found noise to be a problem both at 9 (20%) and 15 months (23%), but many were interrupted while studying. Over 70 percent were interrupted while studying from some to a very great extent. Availability of study time appeared to vary considerably across ships with 32 percent of EPICS respondents indicating they had very little opportunity and 38 percent indicating that they had frequent opportunities.

In the area of knowledge transfer, 28 to 47 percent of the EPICS respondents noted after 9 months that the modules greatly enhanced preparation for advancement in rate, completion of PQS requirements and job skills. In terms of module administration, roughly two thirds of the EPICS personnel rarely experienced delays in getting their comprehensive module tests scored by the ESA.

EPICS Shipboard Administrators. Table 9 indicates that ESAs and EPICS personnel had similar perceptions of the instructional module characteristics. There was a 44 percent reduction in ESAs finding errors in the instructional modules to a great and very great extent from the 6 to 12 month measurement points. ESAs also indicated that the modules went into enough detail about the subject to a great extent (69%) and that EPICS personnel had little difficulty (71%) understanding or using the modules. In contrast with the EPICS personnel responses at 9 and 15 months, one half the ESAs indicated 6 months after implementation that they had little storage space (51%) for instructional modules and that modules were lost, torn, or soiled with dirt, grease, etc. (57%), to some extent.

A majority of the ESAs considered the amount of required study time of EPICS personnel realistic. There was little agreement about the opportunity for EPICS personnel to study during the average work day--one third of the ESAs indicated there was little opportunity while one half indicated there was ample time. This lack of agreement may have been influenced by the particular evolution the ship had been undergoing. A third of the ESAs noted that the instructional modules related well to the maintenance tasks performed by EPICS personnel during the first 6 months aboard ship. Six months later, two thirds indicated that the instructional modules contained a great deal of job-relevant information. The perceptions of job relevance may be a function of the specific module series that EPICS personnel were scheduled to study because the ATD module series was perceived to be more job relevant than the general indoctrination SI and JI series.

The collateral duty as an ESA was not burdensome. At 6 and 12 months, most ESAs were able to score (75%) and administer (81%) the comprehensive module tests easily and promptly. In addition, ESAs generally had enough time (69%) to answer questions about the instructional modules during the first 6 months; however, at 12 months, only 29 percent ESAs had enough time. A gradual reduction in manning levels across NSSMS work centers, which EPICS fleet representatives noted, may have influenced ESA availability or turnover of ESAs had resulted in less attention to EPICS personnel. As intended, the ESAs did not have group sessions with the EPICS personnel (94%).

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Table 9

EPICS Shipboard Administrator Feedback Survey: Responses
6 and 12 months after EPICS Implementation

Item[a]	TAI[b]	Response Category (%)[c]			N	Mean[d]
		Very Little or Little	Some	Great or Very Great		
Instructional Characteristics						
Are there errors in your instructional modules?	6	6	31	62	16	3.9
	12	42	41	18	17	2.5
Are the instructional modules too repetitive?	6	44	44	13	16	2.6
	12	--	--	--	--	--
Do the modules go into enough detail?	6	19	13	69	16	3.6
	12	--	--	--	--	--
Do the comprehensive tests adequately measure what EPICS personnel are learning about NSSMS maintenance?	6	19	56	25	16	3.1
	12	--	--	--	--	--
Do EPICS personnel have difficulty understanding or using the modules?	6	--	--	--	--	--
	12	71	29	--	17	2.1
Shipboard Study Environment						
Do you have adequate storage space for your instructional modules?	6	51	25	25	16	2.4
	12	--	--	--	--	--
Do the instructional modules become lost, torn, or dirty?	6	44	38	19	16	2.5
	12	--	--	--	--	--
Is the amount of study required of EPICS personnel realistic?	6	12	38	50	16	3.3
	12	18	24	59	17	3.5
Do EPICS personnel have time to study the modules during the working day?	6	--	--	--	--	--
	12	36	18	47	17	3.1

[a]Every question started with, "To what extent. . ."

[b]TAI = time (in months) after (EPICS) implementation.

[c]Percentages do not always equal 100 due to rounding.

[d]Means are based on a 5-point response scale, where 1 = very little and 5 = very great.

Table 9 (Continued)

Item[a]	TAI[b]	Response Category (%)[c]			N	Mean[d]
		Very Little or Little	Some	Great or Very Great		
Job Knowledge Transfer						
Do the instructional modules relate well to "hands-on" maintenance?	6 12	13 --	56 --	31 --	16 --	3.3 --
Do the instructional modules include job relevant information?	6 12	-- --	-- 35	-- 65	-- 17	-- 3.7
Administration						
Are you able to promptly score EPICS personnel comprehensive tests?	6 12	6 --	19 --	75 --	16 --	3.9 --
Are the comprehensive tests easy to administer and score?	6 12	6 --	13 18	81 83	16 17	3.9 4.0
Do you have enough time to answer questions of EPICS personnel on their instructional modules?	6 12	12 12	19 59	69 29	16 17	3.6 3.1
Do you spend time with EPICS personnel who need to repeat their modules in order to pass the comprehensive tests?	6 12	19 12	31 35	50 53	16 17	3.3 3.6
Do you need to instruct EPICS personnel in group sessions?	6 12	50 --	44 --	6 --	16 --	2.3 --
Co-worker Use						
Do non-EPICS co-workers use the EPICS modules?	6 12	81 64	13 35	6 --	16 17	1.8 2.0

[a]Every question started with, "To what extent. . ."

[b]TAI = time (in months) after (EPICS) implementation.

[c]Percentages do not always equal 100 due to rounding.

[d]Means are based on a 5-point response scale, where 1 = very little and 5 = very great.

NSSMS Co-workers. Table 10 presents the survey responses of the NSSMS co-workers who report to the work centers after completing all their resident technical training. At least for the first 12 months, they used the EPICS shipboard instructional modules very little. Only 16 percent had used the EPICS instructional modules to a great extent and 71 percent learned a little about their job skills from the instructional modules. How often personnel outside of the NSSMS work center may have used the modules is not known. A series of questions were asked to elicit responses regarding the time available for NSSMS co-workers to study their own shipboard training materials and expanding the amount of training materials required for shipboard study. Their responses to all questions were bell-shaped in distribution with the modal response always "to some extent." Thus, the time available for shipboard study in these work centers varied considerably across ships, probably as a result of operational schedules.

Table 10

NSSMS Co-worker Feedback Survey: Responses
12 Months After EPICS Implementation

Item[a]	Response Category (%)[b]			N	Mean[c]
	Very Little or Little	Some	Great or Very Great		
Shipboard Study Environment					
Do you have time to study rate training modules?	22	36	41	74	3.2
Do you have time to study the ordnance publications?	17	43	39	74	3.3
Is there time for additional technical training materials for the NSSMS?	21	52	27	73	3.1
Is there time for additional general military training?	29	50	22	74	2.9
Would you have time to study instructional modules as part of an ongoing shipboard instructional program?	35	48	17	73	2.8
Job Knowledge Transfer					
Are you learning job skills from the instructional modules?	71	22	7	69	1.8
Co-worker Use					
Do you use EPICS instructional modules?	69	16	16	69	1.9

[a]Every question started with, "To what extent. . ."

[b]Percentages may not equal 100 due to rounding.

[c]Means are based on a 5-point response scale, where 1 = very little and 5 = very great.

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Open-ended Feedback

ESAs from six destroyers provided some feedback after 12 months experience managing the first shipboard training phase (see Appendix B). Their major points were that:

1. Self-study aboard ship was difficult because of the demands placed by the ship upon nonrated personnel and the self-motivation required to study with many distractions.

2. Several mix-ups prevented EPICS materials from being provided in a timely fashion to match the progress of EPICS personnel.

3. Some of the shipboard instructional material should be taught in a school because of a lack of training aids on the ship.

4. The instructional modules aided EPICS personnel in preparing for the E-4 advancement exam.

Interviews

Interviews were conducted with ESAs and EPICS personnel aboard 12 destroyers and 2 aircraft carriers 12 to 15 months after EPICS shipboard implementation (see Appendix C). The ESAs most frequent responses concerning the instructional program were that: (1) the EPICS collateral duty is not time consuming and includes very little paperwork; (2) a brief (1-2 day) administrator training course would be helpful, although the EPICS fleet representative's indoctrination was often adequate; (3) except during certain ship evolutions, EPICS personnel usually have enough time to complete their modules; (4) although the enthusiasm of EPICS personnel increases as they progress through the modules, they often need encouragement to study because of the many distractions aboard ship; (5) because the end-of-module tests rarely have any pass/fail requirements, the ESA usually reviews any items missed with the EPICS student; and (6) progress in shipboard instruction modules is used as one indicator for recommending individuals to attend ETT, but their contribution to the work center is given more weight.

EPICS personnel interview responses indicated that they: (1) were evenly divided over whether or not there was adequate time for shipboard study, (2) considered studying the modules during the 90-day mess cooking stint more difficult than during the normal working regimen, and (3) suggested that the module test questions in the programmed instruction sections and their answers should be separated more.

Equipment Technician Training

Academic Progress

Both attrition and academic progress data were collected from EPICS personnel attending ETT and linked with various predictor variables to answer the evaluation questions. Attrition from ETT does not equate to attrition from the Navy because some individuals who attrited from ETT reported back to their ships. Reasons for ETT attrition were either nonacademic--usually the result of disciplinary offenses--or academic--the result of unacceptable academic progress. Overall, only 12 percent of the individuals attending ETT (N = 112) completed all the coursework during the 14-week school. An additional 49 percent subsequently completed the ETT course aboard ship for a total graduation rate of 61 percent.

Table 11 presents EPICS ETT attrition and progress data by FT eligibility. ETT attrition did not differ between FT-eligibility groups, but attrition in the FT-ineligible group tended to be for academic reasons; and in the FT-eligible group, for nonacademic reasons.

All analyses of predictor and criterion measures were based on the number of individuals who attended the entire 14-week ETT resident training episode (N = 101). Although both the FT-eligibility groups completed the same average number of ETT-P modules aboard ship (see Table 11), the FT-eligible group scored 11 points higher on the precomprehensive electronics test. The FT-eligible group had reliably (p < .001, one-tailed t-test) higher average reading grade level and average AFQT score than the FT-ineligible group. These results reflect the characteristics of the initial EPICS sample enrolled in the program. In terms of progress data, statistically reliable (p < .001) differences favored the FT-eligible group for the average number of study hours, calendar days, and extra study hours required to complete ETT modules 1-11. Although the FT-eligible group consistently required fewer study hours, calendar days, and extra study hours to complete later modules, these differences were not statistically reliable (p > .01). Table 11 shows one contributing factor, a substantial decrease of students in each group as they progressed through the ETT modules. The chi-square statistics computed for each group indicated a statistically reliable (p < .001) reduction in the numbers of students with each successive module series. For example, 2 percent of the FT-ineligible group progressed through ETT module 44 whereas 25 percent of the FT-eligible group progressed to this point. While neither figure is high, the difference between the two groups is substantial and statistically reliable (p < .001).

On the average, the FT-eligible group completed four more modules during the 14-week period than did the FT-ineligible group even though both groups had completed the same average number of ETT-P modules aboard ship. To determine the influence of the amount of shipboard preparation on subsequent ETT progress, ETT students were categorized according to the following degrees of preparation: (1) no ETT-P modules completed, (2) ETT-P modules 1-7 completed, and (3) ETT-P modules 8-14 completed. Table 12 presents the breakdown of the various ETT progress measures by these ETT-P categories. The reading grade level did not vary across ETT-P groups. AFQT differed in only one ETT-P category, but this difference was not statistically reliable (p > .01).

A one-way ANOVA indicated a reliable (p < .001) difference in precomprehensive test scores favoring those who had completed more preparatory modules. In addition, reliable differences in the same direction were found for average number of study hours (p < .001), calendar days (p < .01), and extra study hours (p < .001) to complete modules 1-11. While not statistically reliable, the pattern of differences across ETT-P groups was consistent for completing modules 1-25. A chi-square computed on ETT student groups by ETT-P category and ETT module series completed was statistically reliable (p < .001). This emphasized data on Table 12 indicating that regardless of amount of preparation for ETT, progressively fewer students completed each successive module series.

Overall, individuals who had completed from 8 to 14 ETT-P modules completed four more modules during ETT, on the average, than did individuals who had completed no ETT-P modules; however, a one-way ANOVA indicates that the differences between the ETT-P groups were not statistically reliable (p > .01). The group who had completed ETT-P modules 8-14 averaged 76 calendar days to complete modules 1-25, while those who had completed no ETT-P modules averaged 81 days. This difference was not statistically reliable (p > .01).

Table 11

ETT Student Performance Summary by FT Eligibility

Measure	FT Eligibility		Total
	Eligible	Ineligible	
Number of students			
Entered	59	53	112
Academic attrites	1	4	5
Nonacademic attrites	5	1	6
Attended ETT for 14 weeks[a]	53	48	101
Average number of shipboard modules completed	6	6	6
Average reading grade level**	12	10	11
Average AFQT score**	78	53	66
Average precomprehensive test score	49	38	43
Average predicted study hours to complete:			
Modules 1-25**	317	381	347
Modules 1-34**	431	522	474
Number of students completing:			
Modules 1-11	53	48	101
Modules 1-25	42	25	67
Modules 1-34	25	8	33
Modules 1-44[a]	13	1	14
Average hours to complete:			
Modules 1-11**	108	160	133
Modules 1-25	295	317	303
Modules 1-34	346	358	349
Modules 1-44	356	--	353
Average number of calendar days to complete:			
Modules 1-11**	32	45	38
Modules 1-25	75	82	78
Modules 1-34	86	90	87
Modules 1-44	81	--	81
Average number of extra study hours to complete:			
Modules 1-11**	19	34	26
Modules 1-25	48	54	50
Average number of modules completed**	28	24	26

[a]Students completing modules 1-44 are qualified graduates.

*p < .01, **p < .001; one tailed t-test.

Table 12

ETT Student Performance Summary by ETT-P Modules Completed

Measure	ETT-P Modules Completed		
	None	1-7	8-14
Number of students			
Entered	27	41	44
Academic attrites	0	2	3
Nonacademic attrites	1	2	3
Attended ETT for 14 weeks[a]	26	37	38
Average shipboard modules completed	0	4	12
Average reading grade level	11	11	11
Average AFQT score	63	64	71
Average precomprehensive test score	28	37	51
Average predicted study hours to complete:			
Modules 1-25	362	348	336
Modules 1-34	484	476	464
Number of students completing:			
Modules 1-11	26	37	38
Modules 1-25	15	23	29
Modules 1-34	6	10	17
Modules 1-44[a]	1	3	10
Average hours to complete:			
Modules 1-11**	160	143	104
Modules 1-25	322	307	290
Modules 1-34	348	349	349
Modules 1-44	--	--	358
Average number of calendar days to complete:			
Modules 1-11*	44	40	32
Modules 1-25	81	78	76
Modules 1-34	89	89	85
Modules 1-44	--	--	86
Average number of extra study hours to complete:			
Modules 1-11*	36	28	18
Modules 1-25*	69	51	40
Average number of modules completed	24	26	28

[a]Students completing modules 1-44 are qualified graduates.

*$p < .01$, **$p < .001$; one-way ANOVA up to module 25. Not computed for later modules because of small sample sizes.

Tables 13, 14, and 15 show the interrelationships between predictor and criterion measures of ETT progress. Correlations between predictors (Table 13) indicate that FT-eligibility and AFQT are strongly related. Both these predictors are also strongly related to reading grade level. No statistically reliable relationships were found when the reading grade level, FT eligibility, and AFQT were correlated with the number of ETT-P modules completed.

Table 13

Intercorrelation Matrix Between Predictors of ETT Progress

| | Predictors[a] | | | |
| | FT Eligibility | | AFQT | |
Predictors	N	$\underline{r}$	N	$\underline{r}$
AFQT	101	.72	--	--
Reading grade level	94	.56	94	.52

Note. All correlations displayed are statistically reliable (p < .001).

[a]The variables, fleet and ETT-P modules completed, were also employed as predictors, but never correlated reliably with any other predictors.

Table 14

Pearson Correlations Between Criteria of ETT Progress

| | | Number of Calendar Days to Complete Modules | | | Study Hours to Complete Modules | |
Criteria	N	1-11	1-25	1-34	1-11	1-25
Cumulative hours to complete:						
Modules 1-11	101	.98				
Modules 1-25	67		.89			
Modules 1-34	33			.62		
Extra study hours to complete:						
Modules 1-11	101	.82			.85	
Modules 1-25	67		.50			.72

Note. Only correlations that were statistically reliable (p < .001) are presented.

Table 15

Intercorrelation Matrix Between Predictors and Criteria of ETT Progress

Criteria	N	FT Eligible	AFQT	ETT-P Modules Completed	Precomprehensive Test Score	
					N	r
Precomprehensive test score	70	.36	.45	.55	--	--
Calendar days to complete:						
Modules 1-11	101	-.43	-.53	-.36	70	-.47
Modules 1-25	67		-.37			
Modules 1-34	33					
Cumulative study time (hours) to complete:						
Modules 1-11	101	-.43	-.55		70	-.49
Modules 1-25	67		-.41			
Modules 1-34	33					
Extra study time (hours) to complete:						
Modules 1-11	101	-.35	-.49	-.36	70	-.48
Modules 1-25	67		-.42	-.44	46	-.49
All modules completed	98	.38	.45			

Note. The variables, fleet and reading grade level, were also employed as predictors, but never correlated significantly with the criteria. Only statistically reliable correlations are presented (p < .001).

The correlations between criteria of ETT progress (Table 14) show a consistent decrease in strength of relationship with each successive module series and large correlations between hourly and daily measures of study time. Table 15 provides the intercorrelation matrix between predictors and criteria of ETT progress. Precomprehensive test scores serve both as a predictor and criterion measure. Reliable negative correlations (p < .001) indicate the individuals with high AFQT score, ETT-P modules completed, and FT-eligibility score required fewer study hours, fewer calendar days, and less extra study time to complete the module series. These three predictors appear to be strongly related to ETT progress criteria in the early module series, but unrelated in the later module series. Of these three predictors, AFQT and ETT-P modules completed maintain a statistically reliable relationship (p < .001) with progress criteria across a greater number of modules than the FT-eligibility predictor. AFQT was more strongly correlated to the total number of ETT modules completed than the ETT-P modules completed. The precomprehensive test score, when used as a predictor, correlated strongly with progress criteria for the first 11 modules, but like the other predictors, showed little evidence of a relationship when progress criterion data for later module series were considered.

Although the evaluation predictors of most concern were FT eligibility and ETT-P modules completed, Tables 11 and 12 show that AFQT varied between the groups. Thus, a number of other predictors were considered in three multiple regression analyses to determine the predictor variables independently accounting for the greatest criterion variance. The ETT progress criteria considered were number of calendar days, cumulative study hours, and extra study hours up to module 34 (sample sizes were too small for later modules). The multiple regression results presented in Table 16 indicate that only two of the predictors considered (i.e., FT eligibility, reading grade level, AFQT, fleet, and ETT-P modules completed), AFQT and ETT-P modules completed, accounted for a substantial proportion of criterion variance. AFQT accounted for the largest proportion of criterion variance for most of the measures through ETT module 11.

Table 16

Multiple Correlation Statistics Between Predictors
and Criteria of ETT Progress

Criteria	Predictors	R^2 Net Increase	Multiple R	df
Precomprehensive test score	ETT-P	.31	.55	1,62
	AFQT	.13	.66	2,61
Calendar days				
Modules 1-11	AFQT	.28	.53	1,92
	ETT-P	.08	.60	2,91
Modules 1-25	--	--	--	--
Modules 1-34	--	--	--	--
Cumulative hours				
Modules 1-11	AFQT	.30	.55	1,92
	ETT-P	.11	.64	2,91
Modules 1-25	--	--	--	--
Modules 1-34	--	--	--	--
Extra study hours				
Modules 1-11	AFQT	.24	.49	1,92
	ETT-P	.08	.57	2,91
Modules 1-25	ETT-P	.19	.44	1,61
	AFQT	.12	.56	2,60
Total modules completed	AFQT	.21	.45	1,90

Note. All multiple Rs displayed are statistically reliable (p < .001).

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As expected, the number of ETT-P modules completed accounted for the most precomprehensive test score variance and was related to the amount of extra study time required for the later module groups 20-25 and 30-34. EPICS personnel who were less prepared for ETT required more extra study time to complete the later module groups in the 14-week school period.

Comparisons with BE&E Progress

Progress measures of number of study hours, calendar days, and extra study hours for the EPICS FT-eligibility groups are only summarized through module 25 because sample sizes for the later module series were unreliably small. EPICS groups were contrasted with GM-track graduates of BE&E school, who had completed modules 1-11, and FT-track graduates, who had completed modules 1-25, because BE&E progress data were only available for the end of each course. The GM group's composite aptitude cutoff score (i.e., 206) group was somewhat lower than that of the FT comparison group (i.e., 218).

Figures 8 through 10 compare the performance of the BE&E and EPICS groups. On the average, EPICS FT-eligible personnel required 41 fewer study hours, 5 less calendar days, and 6 more extra study hours than the GM group for modules 1-11; and 43 fewer study hours, 8 fewer calendar days, and 11 more extra study hours than the FT group for modules 1-25. EPICS FT-ineligible personnel required 11 more study hours, 8 more calendar days, and 23 more extra study hours than the GM group for modules 1-11; and 21 fewer study hours, 1 less calendar day, and 17 more extra study hours than the FT group for modules 1-25.

Feedback Survey Responses

EPICS personnel responded to feedback surveys approximately 6 months after attending ETT; ESAs and NSSMS co-workers were surveyed 18 months after EPICS personnel had reported aboard, which, on the average, was 3 months after ETT. Questions asked of each group addressed the transfer of knowledge gained in ETT to the work performed in the NSSMS work center. Table 17 summarizes the responses from all three groups. Because there were so few EPICS personnel, the responses are not broken down by FT-eligibility (see Table 6 for response rates). More than twice the number of EPICS personnel indicated that they had been able to apply their ETT knowledge a little (46%) as compared to a great extent (18%). However, this did not seem to apply to troubleshooting ability; 47 percent of the EPICS participants indicated their troubleshooting ability had been greatly enhanced while 18 percent indicated it had been increased a little. In terms of being able to perform more technical preventive maintenance (PMS) after ETT, nearly as many EPICS personnel reported great improvement (32%) as reported little improvement (39%).

Approximately one third of the ESAs reported that the troubleshooting ability of EPICS ETT attendees increased to a great extent; 43 percent also reported that EPICS personnel were able to perform more technical PMS to a great or very great extent. Similarly, 38 percent of the NSSMS co-workers reported that EPICS personnel were performing more technical PMS after attending ETT to a great extent and 34 percent reported that EPICS personnel were able to apply the knowledge gained from ETT during their subsequent shipboard tour to a great extent.
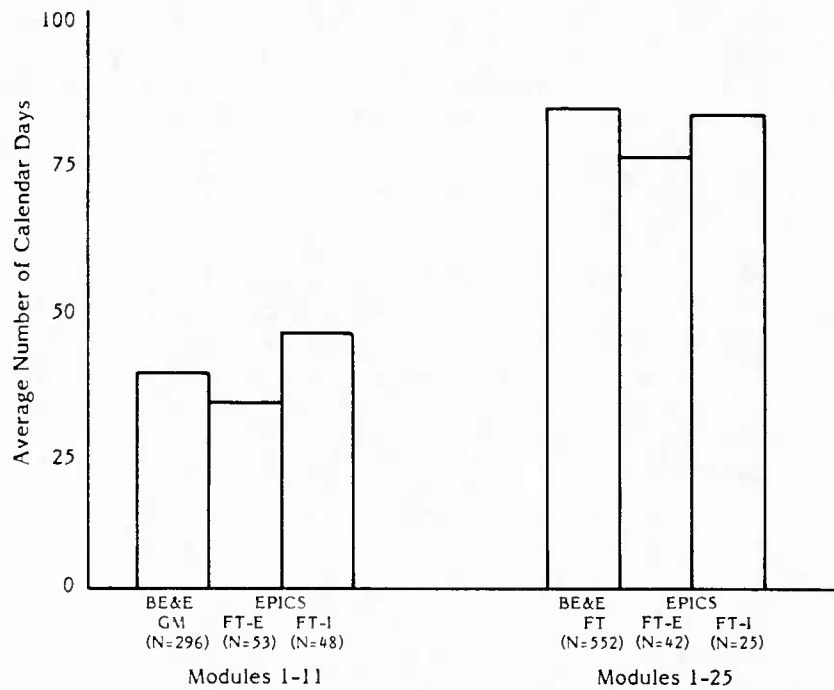
Figure 8. Average number of study hours to complete modules for EPICS FT-eligible and FT-ineligible ETT students and comparison BE&E student groups.
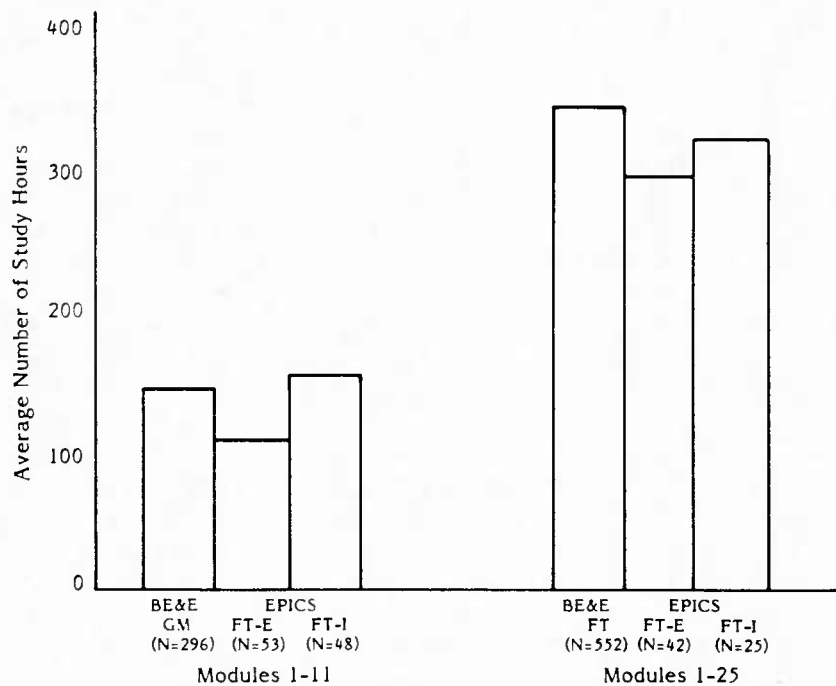
Figure 9. Average number of calendar days to complete modules for EPICS FT-eligible and FT-ineligible ETT students and comparison BE&E student groups.

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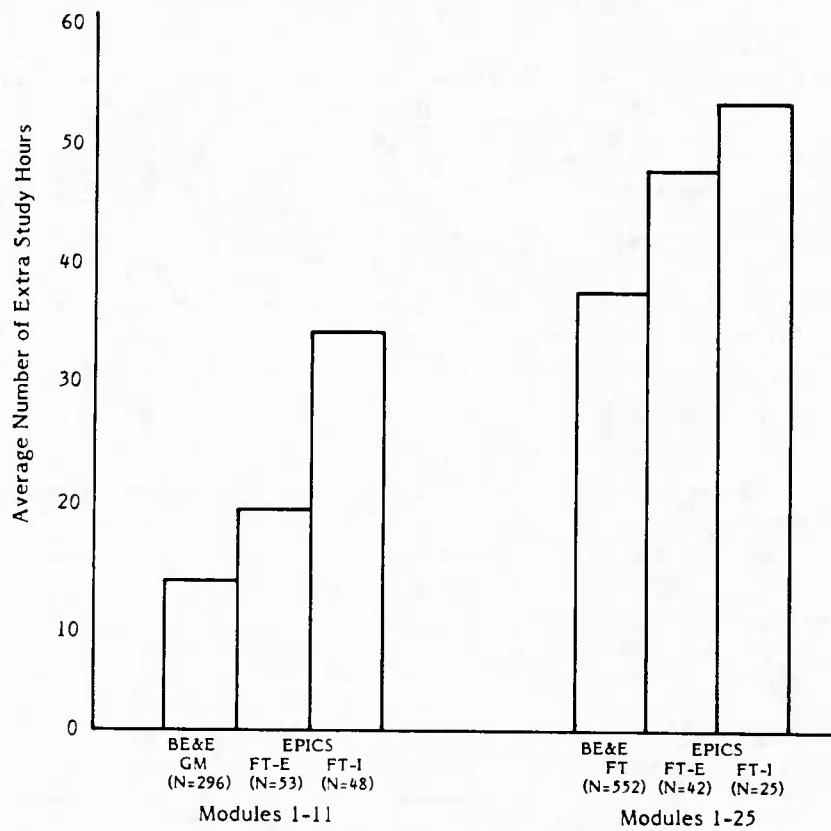
Figure 10. Average extra study hours to complete modules for EPICS FT-eligible and FT-ineligible ETT students and comparison BE&E student groups.

Table 17

Feedback Survey Perceptions of ETT

| Item[a] | Response Category (%)[b] | | | |
	Very Little or Little	Some	Great or Very Great	Mean[c]
EPICS Personnel (N=28)				
Have you been able to apply the knowledge you learned in ETT?	46	36	18	2.5
Did ETT increase your troubleshooting ability?	18	36	47	3.5
Have you been able to perform more technical PMS after ETT?	39	29	32	2.9
EPICS Administrators (N=16)				
Did ETT increase EPICS personnel troubleshooting ability?	12	56	31	3.2
Have EPICS personnel been able to perform more technical PMS after ETT?	24	31	43	3.2
NSSMS Co-workers (N=34)				
Have EPICS personnel been able to apply the knowledge they learned in ETT?	30	35	35	2.9
Have EPICS personnel been able to perform more technical PMS after ETT?	30	32	38	3.0

[a]Every survey question started with, "To what extent. . ."

[b]Percentages do not always equal 100 due to rounding.

[c]Means based on a 5-point scale, where 1 = very little and 5 = very great.

Open-ended Feedback

The open-ended feedback survey responses of EPICS personnel from 11 destroyers regarding ETT approximately 6 months after reporting back to their ships are summarized on pp. B-3 and B-4. Their major comments concerned: (1) lengthening ETT to enable students to complete the course at school, because completing the course on the ship,

especially the 30-series modules, was much more difficult; (2) having EPICS personnel complete the ETT-P modules before attending ETT to improve their progress in school,[1] and (3) a dislike for having fleet returnees attend a "boot-camp" school with its military requirements.

Interviews

Appendix C summarizes comments made to ETT-related interview questions of ESAs and EPICS personnel. Both groups agreed that ETT modules brought back to the ship would be more difficult to complete than the modules designed to complete aboard ship. According to both groups, ETT attendees could perform tasks of somewhat greater complexity with greater confidence. Furthermore, EPICS personnel found electronics-related, informal OJT was easier after attending ETT. Given the small size of the NSSMS work centers ($\overline{N}$ = 10), sending members to school affected collateral duty assignments, but not the maintenance required for the missile system. Some EPICS participants returned to their ship while it was in the yards, which severely reduced their opportunity to apply any knowledge gained in ETT.

DISCUSSION

First Shipboard Training Phase

Completion Times

As originally designed, SI and JI modules required the least amount of study time to complete of all the module series of the first shipboard phase. Although ATD modules 1-6 did not require the most study time, they required the most calendar time to complete. This may have been because EPICS personnel took longer breaks between ATD modules than those of other modules series. ETT-P modules 1-7 were the most difficult to complete because they required the greatest amount of study time. These findings are representative of both FT-eligibility groups as there were no statistically reliable differences between the shipboard training progress. In earlier "A" school studies (Bilinski, 1974; Bilinski & Standlee, 1974) in which the order of the shipboard and school phases was reversed, the eligible group also performed better than the ineligible groups in school but not in shipboard performance criteria.

The EAG projected that the total shipboard time for EPICS personnel to complete all the modules and be prepared for ETT school would range from 9 to 11 months. The prediction of 9 months was reasonably accurate for the fastest individuals, but 70 percent of the EPICS personnel needed at least 14 months to qualify for ETT. In fact, the shipboard time prior to attending ETT averaged 15 months. Thus, system technician training (i.e., the second shore-based school) will have to be 4 to 5 months later than expected unless a majority of personnel accelerate through the second shipboard training phase. This means that work centers will have a person contributing at lower skill levels for a longer period of time than originally anticipated, which could be a concern to work centers with marginal manning levels and distribution of skills to meet their responsibilities.

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[1]The EPICS project office recommended this repeatedly to the ships with modest success.

For the individual, the length of the first shipboard training phase depends partly on the amount of study effort. The ESAs use study effort and progress as criteria for recommending EPICS personnel for a shore-based school. If the individual has made little effort or progress or will plateau at the initial skill level, there would likely be little ESA encouragement to continue shipboard study, thus significantly reducing the chances of the individual ever attending ETT during the remainder of the enlistment.

Both the length and timing of this first shipboard training phase relative to the ship's schedule are important considerations for the Navy activity scheduling school attendance. Individuals who complete their first shipboard training phase during a deployment will rarely be allowed to attend school until the deployment is over. The ETT interview data indicate that such restrictions did occur and recommended some remedy be incorporated in the future.

Differences between the time EPICS FT-eligible and FT-ineligible groups took to complete each shipboard module series were not statistically reliable. Roughly 12 percent more of the FT-eligibles completed all the shipboard modules than the FT ineligibles (see Figure 2). These two findings indicate that, while both groups had about the same progress rate of shipboard study, more FT eligibles were likely to complete the course work.

While shipboard instructional progress is partly determined by the individual, the ship's operational scheduling also has a considerable impact. Survey and interview responses indicated that all EPICS personnel experienced interruptions to their studies, which were often a problem, and that certain ship evolutions were easier for shipboard study than others. This would partly account for the great variability in completion times of the shipboard instructional program prior to ETT. As the ship operational schedule cannot be modified to make allowances for shipboard study, a study incentive plan or greater command control of shipboard training might decrease extreme variability in completion times.

EPICS Shipboard Instruction

EPICS falls within the broadest definition of a formal OJT program although it uses JPAs and self-paced instruction to reduce the training demands placed on the shipboard supervisor. Thus, the influence of many shipboard factors on administration and student progress is similar. One recent Department of Defense report (DETEC, 1981) examined many of the advantages and disadvantages of OJT that might also apply to self-study programs. The disadvantages include:

1. Excessive nonmission requirements such as mess cooking.

2. Priority conflicts with varying operational commitments.

3. Operational environmental constraints such as equipment downtime.

4. Intrusive distractions.

5. Personnel turbulence due to individual replacement and ship's operational cycle.

6. Inadequate identification of tasks more appropriately learned in school.

7. Widely varying, unstandardized methods and quality control.

8. Over-reliance on first-term personnel as shipboard instructors.

The following advantages of OJT programs might also apply to shipboard self-study programs:

1. Greater flexibility than formal school training.

2. Reduction of school lengths, number of instructors, and number of students.

3. Greater productivity of trainees during training than of schoolhouse students.

4. A complement to school training by filling in specifics and providing practice.

5. Reduces boredom and useless feelings of students in lengthy schools.

The stability of the organizational environment is also a critical factor in determining the applicability and scope of an OJT program. DETEC (1981) identified three types of Navy organizations on which the impact of OJT programs would differ: (1) Continuously operating units that perform the same functions during peace and war time, (2) units whose major peacetime concern is training, and (3) units whose operational tempo is cyclical. Navy ships often fit into the last category because the opportunity for structured training occurs when the ship is homeported and the learning experience can be reinforced during deployments. In contrast, post-deployment and overhaul periods often remove trainees, supervisors, or access to equipment so that OJT is extremely difficult.

With few exceptions, OJT programs have no dedicated shipboard training personnel. The DETEC report concluded that OJT alternatives such as shipboard self-study programs might be ineffective because most service members need an experienced supervisor to guide and motivate them. EPICS attempted to address this issue by including the ESA collateral duty as an integral component, but the survey and interview responses indicate that EPICS personnel need more encouragement and guidance as they proceed through their studies. Due to the small size of NSSMS work centers, ESAs usually were petty officers second class serving their first enlistment. Perhaps the ESA collateral duty requires more time, control, and recognition or a more senior individual to guide shipboard study more effectively. Another alternative is to have module progress formally included as a performance evaluation factor for both shipboard trainees and ESAs.

In general, both EPICS personnel and ESAs perceived the instructional characteristics of the shipboard modules favorably. The ships generally had adequate lighting, noise level, and places for study. However, EPICS personnel were often interrupted during their studies and the amount of study time available varied considerably during the first shipboard training phase. Again, the ship's operational schedule was an influential factor. The underway period of deployment was considered the most conducive to shipboard study, while in-port operations and living aboard the ship in the yards were the least conducive to study. While ESAs thought that the modules required a reasonable amount of study time, they also noted that the amount of study time available varied. Both EPICS personnel and the ESAs agreed that the ESA collateral duty is not time consuming and requires little paperwork. ESAs believed more than did EPICS personnel that storing the modules in the small spaces allotted the NSSMS work center is a problem. Some also observed that the modules need more durable covers than the original heavy paper ones.

The EPICS personnel and ESAs differed in their perceptions of job-knowledge transfer with the former group perceiving little transfer and the latter group perceiving much

more relevance. This may be a reflection of the particular set of modules referred to by the respondents. The SI and JI series were orientation modules that were to facilitate adaptation to the shipboard environment and the NSSMS work center not to provide directly transferable technical skills. In addition, the ETT-P module series were just that, preparation for the shore-based school. The ATD modules series, which was the only job-related series, may not have been timely for all EPICS personnel because of a particular ship evolution (e.g., overhaul). ESAs, on the other hand, probably tended to view the value of the ATD phase modules from a training perspective and not from how the knowledge could be immediately applied to work. Some EPICS personnel did perceive the shipboard modules as helpful in preparing for the E-4 rating exam probably because much of the instructional material was oriented to general shipboard life or preparation for ETT.

ESAs also noted another aspect of shipboard instruction that would not impact EPICS personnel in later shipboard training phases: the nonrated status of EPICS personnel for the first shipboard training phase. Nonrated personnel are required to participate in all ship-wide duties such as working parties, compartment cleaning, and facility maintenance. They are also assigned a 90-day mess-cooking tour at some time after reporting aboard. This is probably one reason why the ESAs noted that EPICS personnel need encouragement from senior personnel to study their modules.

Encouragement and guidance from senior personnel, especially a respected ESA helped to counter shipboard obstacles to shipboard study. Without this support, only the most motivated personnel will be able to weather the negative factors of the shipboard environment. The fact that FT-eligibility was not an influential factor in shipboard instructional progress probably reflected the multiple formats available for the shipboard modules and the general lack of any theoretically challenging material until the ETT-P module series. While individual motivation, as reflected in an effort to study aboard ship, is a quality that should be demonstrated, many 18-20 year-olds thrust into a dynamic shipboard environment are not likely to progress through the instructional program without assistance and recognition of their accomplishments.

NSSMS co-workers used the EPICS shipboard instructional modules very little possibly because they were generally journeyman technicians who did not need and were not interested in instructional modules oriented to personnel without technical training. In addition, co-workers noted that study time varied considerably for any kind of shipboard training course or program.

Equipment Technician Training

Membership in each EPICS FT-eligibility group strongly influenced ETT academic progress. On the average, the FT-eligible group scored reliably higher on the AFQT, ETT precomprehensive test, and reading grade level test and completed more instructional modules in less time during the 14-week ETT course. The FT-eligible group completed each of the ETT module series in less study time, fewer calendar days, and fewer extra study hours. The FT-eligibility composite score is used to screen people academically for entry into conventional FT-track electronics schools. In this study, there was a close relationship ($r = .72$; $p < .001$) between membership of EPICS personnel in each FT-eligibility group and their AFQT score. In addition, the multiple regression analyses indicated that AFQT score accounted for the greatest progress criterion variance. Thus, AFQT score was an even stronger predictor of ETT progress than was FT eligibility. This is partly due to the bimodal AFQT distribution for EPICS personnel as a result of an initial selection criterion (see Blanchard, Clelland, & Megrditchian, 1984). The two AFQT score ranges represented most frequently are 31-48 (ASVAB Mental Category IIIb) and 65-92

(ASVAB Mental Category II). Thus, the bimodal nature of the AFQT distribution might have inflated the strength of its relationships with ETT progress measures.

Another aspect of the FT-eligibility relationship with academic progress worth noting is that the most successful FT ineligibles do not conform to their categorization. These individuals might be classified as "false negatives" because they were quite successful academically in EPICS, but their FT-eligibility scores would have prevented them from attending an advanced electronics field school. If successful individuals are defined as those who completed modules 1-34 in ETT, 17 percent of the FT-ineligible attendees were successful. These individuals, however, only represent one out of every ten FT ineligibles who initially enrolled in EPICS.

The EPICS personnel completing each module series represented a successively stronger academic group. For example, the 25 EPICS FT-ineligible personnel who completed ETT modules 1-25 in 14 weeks were the strongest academically of the original 48 who had completed modules 1-11. This pattern of academic screening affected the criterion measures of each successive module series. The progress rates of the FT-eligibility groups differed considerably (see Table 11) and sizable proportions of both groups did not complete the entire ETT curriculum within the 14-week timeframe. EPICS personnel completed an average of six ETT-P modules before attending ETT, which was clearly inadequate for the 88 percent of the individuals who attended ETT and did not complete the course. Individually, the length of ETT and the amount of instructional material did not affect progress through the school, but combining these two factors also decreased the probability that EPICS personnel would complete the course within the expected timeframe.

The number of ETT-P modules completed was the second most important factor in predicting progress through ETT. There was a strong relationship, as predicted, between all criteria of ETT progress and degree of ETT preparation. Individuals who completed at least eight ETT-P modules, on the average, completed four more modules during ETT than did those who completed fewer modules, but this result was not statistically reliable ($p > .01$). Apparently, many individuals and their ESAs did not follow the recommendation to complete all 14 ETT-P modules before ETT school. The interviews and open-ended survey responses suggest that inability to coordinate the ship's schedule, individual progress, and ETT school attendance may have contributed to the inadequate preparation of some ETT students.

EPICS FT-eligible personnel consistently progressed faster through the first 25 modules than did the BE&E comparison groups. Differences in BE&E and ETT data structures, however, prevented a statistical analysis to determine if these differences are statistically reliable. Given the similar aptitude levels of the comparison groups, the factor most likely contributing to differences in progress is the amount of preparation for ETT that the FT-eligible group had. On the other hand, the FT-ineligible group had the same ETT preparation, but exhibited a considerably different pattern of progress than the BE&E comparison groups. The FT-ineligible group was slower than the GM-track graduates from module 1 through 11, but slightly faster than the FT-track graduates from module 1 through 25. This apparent improvement in academic progress probably reflects the 50 percent reduction in the number of FT-ineligibles managing to complete 14 more modules after Module 11.

Fewer than half of the ESAs and NSSMS co-workers observed a substantial increase in the troubleshooting ability of EPICS personnel after ETT perhaps because ETT emphasizes a general electronics curriculum as does BE&E. Possibly the more positive responses

about troubleshooting ability of the EPICS personnel refer to the new skill of using test equipment and not to performing complex fault isolation tasks. ESAs and co-workers seem to support this idea by indicating that EPICS personnel troubleshooting skill had not changed much after ETT, but their ability to perform technical maintenance tasks had improved to some extent. ETT attendance may have increased ESA and the NSSMS co-worker confidence in the EPICS personnel and, as a result, they were more likely to assign them to higher level maintenance, although this varied considerably across NSSMS work centers.

During the interviews and in the feedback surveys, ESAs and EPICS personnel made the following recommendations: (1) lengthen time at ETT, (2) modify ETT to match the characteristics of the fleet returnee rather than the recruit trainee, and (3) integrate ETT attendance with ship schedules to optimize individual progress prior to attendance, reduce impact on the work center mission, and provide EPICS personnel with an immediate opportunity to apply the knowledge they learned in school. The second recommendation stems from the fact that ETT was convened at the Naval Training Center (NTC), San Diego where the administrative policies focus on newly graduated recruits. Although all EPICS ETT students were fleet returnees and were assigned to their own carrel group, NTC policy still dictated much of their school lives. These policies were quite difficult for the EPICS personnel to adapt to after an average of 15 months at sea. The third recommendation underlines the impact of ship schedules on the EPICS school scheduling. This may have resulted from the compressed four-year EPICS T&E. If EPICS were implemented and personnel were offered the program as a recruiting incentive, it would require a two-year extension to attend the second shore-based school. This operational six-year program would also need to consider the impact of this variable on work center manning and school knowledge transfer. Impact on work center manning requirements is a primary consideration prior to ETT, whereas the type of operational evoluation the ship is undergoing when the ETT student returns will determine the degree of knowledge enhancement or deterioration that will finally be gained from the resident training assignment.

CONCLUSIONS

First Shipboard Training Phase

Greater time allowances will need to be estimated for personnel to complete the first shipboard training phase if future implementation conditions approximate those encountered during the EPICS T&E. The length of the first shipboard training phase was increased by the operational schedule of the ship, interruptions during study, and the nonrated status of EPICS personnel. The factor most strongly related to decreasing the length of the first shipboard training phase was encouragement and guidance from senior personnel, especially a respected ESA. Instructional progress during the first shipboard training phase was not reliably different between the two FT-eligibility groups.

Lengthening early EPICS training phases would postpone later training phases unless EPICS personnel begin to progress at a faster rate than planned. For example, the current EPICS cohort required an average of 15 months of shipboard time to attend ETT and, if they are to attend system technician training in the planned timeframe, they would need to complete the second shipboard phase in half of the projected 10-month period. The EPICS T&E compressed a six-year career path into a four-year enlistment and, if the six-year timeframe was adhered to during a re-implementation, more temporal flexibility would be available.

EPICS program elements such as ESA collateral duty and the instructional character-istics of the shipboard modules were quite satisfactory both on quantitative and fleet acceptance criteria. ESAs also differed from EPICS personnel in their perceptions of adequate instructional material storage space and durability, but it can be concluded that storage space can be a problem, probably more so on the smaller ships (e.g., destroyers) and that modules had marginal protection from shipboard wear and tear.

Equipment Technician Training

Progress in ETT school was strongly influenced by: (1) general aptitude as measured by the AFQT score (the bimodal distribution of the EPICS personnel may have inflated this relationship); (2) FT eligibility, which can be interpreted as an indicator of general electronics aptitude and is highly correlated with AFQT; and (3) the number of ETT-P modules completed regardless of FT-eligibility status. Ship schedules affect personnel preparation, ETT attendance, and, therefore, ETT completion. The academic progress of FT ineligibles would probably have been enhanced if they had completed all of the ETT-P modules.

The general electronics training provided in ETT increased the confidence of supervisors in their EPICS personnel and provided attendees with the skills to use test equipment. Although the system-specific knowledge necessary to perform complex fault isolation and maintenance will not be acquired until system technician training school, ETT seems to provide only marginal skill level enhancement.

Many EPICS personnel and ESAs thought that ETT should be longer and some changes are needed to improve the ETT completion rate. NTC administrative policies do not reflect the experience and seniority of EPICS fleet returnees to attend ETT.

RECOMMENDATIONS

All of the following recommendations address modifying and improving the first EPICS shipboard training phase, the first EPICS shore-based training phase, or future EPICS evaluation efforts and related research. That is, no recommendations are presented for EPICS training elements that performed satisfactorily.

First Shipboard Training Phase

1. The enrollment and academic progress of FT ineligibles who are in also mental category (MENCAT) IIIa (AFQT scores from 49-64) should be studied. Nearly all EPICS FT ineligibles were in MENCAT IIIb (AFQT scores from 31-48) and most of them experienced great difficulty with their first major academic challenge, ETT. MENCAT IIIa personnel should be considerably more successful and still enable the Navy to expand its personnel resource pool cost-effectively beyond the current FT-eligible pool. MENCAT IIIa personnel should be enrolled in a test and evaluation implementation and not operationally. If EPICS were implemented in the near future, only FT-eligible personnel should be enrolled until success of MENCAT IIIa personnel can be assessed.

2. The shipboard instructional modules should be reviewed for relevance to the job during the first shipboard duty assignment. Possibly this training phase could be expanded to include the equipment technician duty module series normally included during the second shipboard training phase. This would have the added benefit of enabling exceptional individuals to accelerate through the shipboard training.

3.   Options for improving the durability of shipboard modules should be investigated. One suggestion was to use a heavy-duty three-ring binder for each module series. Individual modules would be removed only if more than one individual were working on the same module series at the same time. A second alternative--if not too costly--might be to use a new type of wear-resistant and easily cleaned paper. A third option might be to display and store the shipboard instructional modules on microcomputers with each module series stored on a floppy diskette and with instructional progress data automatically collected to assist both student and ESA. However, microcomputers are not as flexibly used as paper modules and might require formal, scheduled administration of the material in a single location.

4.   The interaction between the ship's operational schedule and shipboard study should be analyzed during the first shipboard training phase and should take the EPICS personnel nonrated status into consideration. If possible, the EAG should incorporate study planning strategies and guidelines for the ESA that reflect the dynamic nature of ship operations. More feedback could be solicited from shipboard personnel and prior literature addressing the shipboard training issues should be searched for other "lessons learned." Any method to deal with this issue should be reviewed. For example, if the ship is scheduled for deployment, perhaps other shipboard duties could be emphasized during the preparation-for-overseas-mission ship evolution and shipboard study emphasized during the deployment. A recent Air Force study (Rueter, Bell, & Malloy, 1980) developed a methodology for estimating the optimal capacity of operational units to conduct OJT without compromising established training quality and mission performance standards. A similar methodology should be developed for all future EPICS shipboard training design efforts.

5.   Given the changing schedules of ships and the frequent rotation of personnel, an indoctrination course for ESAs, possibly on a videotape, should be developed (most ships have closed circuit television or videocassette recorders) to supplement the EPICS fleet representative's visits. A videotape could provide standardized information for newly assigned ESAs (e.g., during deployment) and emphasize the importance of senior personnel support in terms of benefits for the work center (e.g., higher skill level contribution).

6.   The individualized, self-paced characteristics of EPICS shipboard study should be reexamined in view of the extremely wide range of instructional progress across individuals and ships. Future implementations might include time-based incentives and requirements to balance the personnel needs of the operational units with the advantages of tailoring mastery of the instructional material to an individual's aptitudes and motivation through self-pacing.

Equipment Technician Training

1.   Provide stricter academic screening and mandatory preparation of personnel prior to ETT attendance. EPICS participants should be required to complete ETT-P modules 1-14 and meet test standards to ensure their adequate preparation for ETT, which is the first major training investment, and thereby avoid lengthening ETT.

2.   Review the structure and content of ETT. Structural changes might include converting to the BE&E variable-time format or simply increasing the time allowed for ETT and incorporating a student attendance flow similar to current "C" schools, but this alternative might be less flexible for matching ship's schedules.

Any content review should determine if ETT course content is intended to prepare the individual for further electronics training or for the job requirements of the next shipboard duty assignment. Although there would undoubtedly be some overlap of content to meet either objective, the current content of ETT seems to emphasize preparation for further electronics training as does the BE&E curriculum upon which it is based. Other than informal OJT, however, an ETT graduate would not receive advanced electronics training for some time (i.e., until system technician training). Indeed, the conventional counterparts of ETT graduates, who have attended BE&E and Phase 1 of FT "A" school, are often expected to perform only scheduled maintenance and to serve as operators. EPICS personnel already demonstrated these skills before attending ETT (Blanchard, Clelland, & Megrditchian, 1984). Thus, ETT's current content may not be necessary to provide skill enhancement for subsequent shipboard duty. If the ETT learning objectives are to remain the same, a single school after the first shipboard training phase might combine a reduced ETT with system technician training (i.e., the second shore-based school). Participants would be absent from the ship longer but they would only leave once (instead of twice) thus reducing the number of potential conflicts with the ship's schedule as well as travel costs.

ETT might be redesigned by applying a functional context training (FCT) approach originally applied to a U.S. Army course (Shoemaker, 1967) and currently being assessed for its generalizability to Navy electronics courses. This approach emphasizes job-performance oriented instructional material and provides theoretical technical information only when necessary to enable further learning. Thus, for a skill-level-by-skill-level development structure like EPICS that attempts to target knowledge gained from resident training episodes at the job requirements of the next shipboard phase, FCT seems to provide useful instructional design guidelines. Furthermore, the FCT process of transitioning an individual from specific job/system-related skills to a broader, more flexible theory-based knowledge dovetails exceptionally well with basic EPICS tenets.

3. The apparent mismatch between fleet returnees and the current ETT school setting should be reduced. The ETT course might be relocated at a Fleet Training Center, which might be feasible for a course with a small student flow. ETT might be restructured so that NTC policies could identify it as a separate sub-entity that requires a different management approach. This would be easy to implement if BE&E recruits and ETT fleet returnees were kept in separate carrel groups. The current NTC policy of placing fleet returnees with the recruits would not work well with large numbers of EPICS personnel. If, as suggested in ETT recommendation 2, ETT and system technician training were combined into a single shore-based training episode, it is also possible to locate this course at the systems school command(s) for the NSSMS.

4. Guidelines for dealing with the impact of school/ship scheduling on work center operation, preparation for ETT, application of ETT knowledge, and time in service should be developed. For example, ship evolutions should be ranked according to which has the most and least negative impact on each of these areas of concerns. Deployment might be listed as the most negative factor influencing school attendance, but also as the easiest time for ETT preparation or for reinforcing ETT knowledge. These guidelines should be provided to work center/ship management to assist in planning an individual's shipboard and shore-based training.

EPILOGUE

Some of these recommendations have been incorporated, in one form or another, in the current EPICS re-implementation effort.[2] For example, all EPICS personnel currently being enrolled are FT eligibles and much stricter standards are being applied to screen potential ETT attendees. Each participant's instructional progress is monitored and compared to the recommended time guidelines. This information is periodically fed back to the individual and his supervisor. Each ETT-P module has a test, and two comprehensive tests have been developed for ETT-P modules 1-7 and ETT-P modules 8-14. In addition, an ETT prerequisite test covering all 14 ETT-P modules has been developed. This test will be administered independently like a rating exam and a score of 60 percent will be the cutoff criterion for qualification for ETT. A very fast individual can now study the module series for the second shipboard training phase rather than wait until after ETT.

This evaluation has reported on the degree to which training has been accomplished during this first half of the EPICS T&E. The two remaining training phases, equipment technician duty and system technician training, are currently being evaluated. The last phase of the EPICS program, system technician duty, has no standardized shipboard training and will be evaluated for other program objectives.

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[2] NAVPERSRANDCEN ltr ser. 400 of 9 May 1984.

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APPENDIX A

DATA COLLECTION INSTRUMENTS

EPICS ADMINISTRATOR

FEEDBACK FORM INSTRUCTIONS

1. This feedback form is designed to ask you what you think about various components of the EPICS program. This is not a test and there are no "right" or "wrong" answers.

2. The answer sheet is designed to be recorded by a machine. Answer the questions by marking your choices in the spaces on the answer sheet as illustrated in the following example:

To what extent . . .

1. do you like working for the Navy?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

3. Please use a soft pencil, and observe carefully these important requirements:

*Make heavy black marks that fill the spaces.
*Erase clearly any answer you wish to change.
*Make no stray markings of any kind.

4. When you have finished, seal the answer sheet and the feedback form in the self-addressed envelope provided. Either mail this off or give it to the EPICS Field Representative. Thank you.

Feedback Form A

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

1. do EPICS people assigned to you perform difficult maintenance tasks such as infrequently occurring PMS tasks or corrective maintenance tasks?

2. do you assign EPICS people maintenance tasks beyond those usually requiring an "A" school graduate?

3. do you give EPICS people maintenance tasks below those usually requiring an "A" school graduate?

4. is the EPICS Administration Guide useful to you in answering questions about the EPICS program?

5. do you need to consult the EPICS Administration Guide?

6. can you administer the EPICS program without the EPICS Administration Guide?

7. does the EPICS Administration Guide provide too much detail (Boilerplating)?

8. does the EPICS Administration Guide lack sufficient detail?

9. is it difficult to find information in the EPICS Administration Guide?

10. is the reading level (e.g., use of jargon and specialized terms) of the EPICS Administration Guide about right?

11. did the EPICS Administration Guide explain how to operate the instructional system aboard ship?

12. is the EPICS Administration Guide useful in answering questions about EPICS?

13. do people in your work center, who are not in the EPICS program, use JPAs on jobs for which JPAs are provided?

14. do EPICS people use MRCs instead of JPAs on a job when the JPAs are available?

15. does having JPAs make you more confident in assigning EPICS people to jobs?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

16. do you have to assist EPICS sailors when they're using JPAs?

17. are you asked to show EPICS people in your work center how to use JPAs?

18. are the JPAs easily lost?

19. do you have difficulty getting JPAs for your work center?

20. are the JPAs too simple for you?

21. do you find the job performance aids (JPAs) hard to understand?

22. are JPAs too detailed?

23. do JPAs have too many pages?

24. are the JPAs correct?

25. are the JPA pictures hard to follow?

26. would you be satisfied with using JPAs for all work center maintenance?

27. do JPAs contain all the information needed to do the job?

28. is it necessary to have more introductory training in the use of JPAs?

29. do JPA pages get lost, torn, or dirty?

30. are JPAs easy to handle while working?

31. do you have enough time to answer questions of EPICS sailors on their self-instructional materials?

32. are you able to keep EPICS sailor records up-to-date?

33. is there adequate storage space for instructional materials aboard ship?

34. are there errors in the instructional modules?

35. are you able to promptly score EPICS sailor comprehensive tests?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

36. does the EPICS Project Development Office keep you adequately supplied with forms and instructional materials?

37. do instructional materials become lost, torn, or dirty?

38. do the instructional modules relate well to "hands-on" maintenance task?

39. does the NPRDC Field Representative/EPICS Project Development Office provide adequate support to you in your role as an EPICS Administrator?

40. are the comprehensive tests easy to administer and score?

41. are the instructional modules repetitive?

42. do the instructional modules go into sufficient detail?

43. do you spend time with EPICS sailors who need to repeat their instructional modules/lessons in order to pass the comprehensive tests?

44. do you need to instruct EPICS sailors in group sessions?

45. do the comprehensive tests adequately measure what EPICS sailors are supposed to learn about NSSMS maintenance?

46. is the amount of study required of EPICS sailors realistic?

47. do non-EPICS people in your work center use the EPICS instructional modules?

EPICS ADMINISTRATOR FEEDBACK FORM A-1

Instructions

1. This feedback form is designed to determine your opinion of various aspects of the EPICS program. Since you have been or are serving as an EPICS administrator, your first hand experiences are most important in evaluating the program. This is not a test and there are no "right" or "wrong" answers. This form should be completed after all or most EPICS sailors have completed Apprentice Technician Duty (ATD) or after all or most have been aboard ship for 12 months. It will require less than 10 minutes of your time.

2. The answer sheet provided is designed to be scored by a machine. Answer the questions by marking your choices in the spaces on the answer sheet as illustrated in the following example:

To what extent . . .

1. do you feel you understand the basic goals of the EPICS program?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	▌	:: ::
1	2	3	4	5

In the example, Response 4 has been blacked-in indicating that the respondent feels he understands the basic goals of the EPICS program to a great extent.

3. Since the feedback form refers to all EPICS sailors on your ship, preface each people-related question with "generally" or "on the average". For example, "Generally, to what extent do EPICS sailors have difficulty using the instructional modules?"

4. Please use a soft pencil, and observe carefully these important requirements:

    *Make heavy black marks that fill the spaces.
    *Erase clearly any answer you wish to change.
    *Make no stray markings of any kind.

5. At the end of the form, space is provided for you to enter any comments you may wish to make on any of the questions or about any aspect of the EPICS program.

6. When you have finished, seal the answer sheet and the feedback form in the self-addressed envelope provided. Either mail or give it to the EPICS Field Representative. Thank you very much for your feedback.

Feedback Form A-1

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

1. is the EPICS Administration Guide useful in answering questions about the EPICS program?

2. do you need to consult the EPICS Administration Guide in administering the program?

3. is it difficult to find information in the EPICS Administration Guide?

4. does the EPICS Administration Guide adequately explain how to administer the instructional modules and comprehensive tests?

5. did you find the EPICS Administration Guide useful in explaining how to assign JPA tasks to EPICS personnel?

6. do EPICS personnel use JPAs in performing scheduled maintenance?

7. do personnel in your work center, who are not in the EPICS program, use JPAs on tasks for which JPAs are provided?

8. do EPICS personnel use MRCs instead of JPAs when JPAs are available?

9. does having JPAs make you more confident in assigning EPICS personnel to certain tasks?

10. do you have to assist EPICS sailors when they're using JPAs?

11. do your EPICS sailors find the job performance aids (JPAs) easy to follow?

12. are the JPAs overly simplified?

13. do JPAs have too many pages?

14. are there errors in the JPAs?

15. would you be satisfied with using JPAs for all work center maintenance?

16. do JPAs contain all the information needed to do the job?

17. is it necessary to have introductory training in the use of JPAs?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3 ·	4	5

To what extent . . .

18. do you have enough time to issue instructional modules, score tests and answer questions on EPICS instructional materials?

19. are there technical errors in the instructional modules?

20. do the instructional modules include job relevant information?

21. does the NPRDC Field Representative/EPICS Project Development Office provide adequate support to you in your role as an EPICS Administrator?

22. are the comprehensive tests easy to administer and score?

23. are you able to spend time with EPICS sailors who need to repeat their instructional modules/lessons in order to pass the comprehensive tests?

24. is the amount of self-study required of EPICS sailors realistic?

25. do non-EPICS personnel in your work center use the EPICS instructional modules?

26. do EPICS sailors have time to study the instructional modules during the working day?

27. do EPICS sailors have difficulty understanding or using the instructional modules?

28. do you assign EPICS personnel to maintenance tasks equal in difficulty to those usually assigned to "A" school graduates?

29. do you feel you understand the primary objectives of the EPICS program?

30. does the EPICS program demand more time for administration than you have to devote?

31. are you able to keep EPICS sailor progress records up-to-date?

32. have EPICS sailors required your advice regarding personal problems?

33. do most EPICS personnel seem to be adjusted to shipboard life?

34. do EPICS sailors perform their shipboard duties in a responsible manner?

EPICS Administrator Comments

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EPICS ADMINISTRATOR FEEDBACK FORM A-2

Instructions

1. This feedback form asks for your opinion of various aspects of the EPICS program. Since you have been or are serving as an EPICS administrator, your first-hand experiences are most important in evaluating the program. This is not a test and there are no "right" or "wrong" answers. This form should be completed after some EPICS sailors have completed ETT School or after most have been aboard ship for 18-24 months. It will require about 15 minutes of your time.

2. Answer the questions by marking your choices in the spaces on the answer sheet as illustrated in the following example:

    To what extent . . .

    1. do you feel you understand the basic goals of the EPICS program?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	▌	:: ::
1	2	3	4	5

In the example, Response 4 has been blackened-in indicating that the respondent feels he understands the basic goals of the EPICS program to a great extent.

3. Preface each people-related question with "generally" or "on the average". For example, "Generally, to what extent do EPICS sailors have time to study the instructional modules?"

4. Please use a soft pencil, and observe carefully these important requirements:

    *Make heavy black marks that fill the spaces.
    *Erase clearly any answer you wish to change.
    *Make no stray markings of any kind.

5. When you have finished, seal the answer sheet and the feedback form in the self-addressed envelope provided. Either mail it or give it to the EPICS Fleet Representative. Thank you.

Feedback Form A-2

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

1. do you feel you understand the primary objectives of the EPICS program?

2. does the EPICS program demand more time for administration than you have to devote?

3. are you able to keep EPICS personnel progress records up-to-date?

4. do EPICS personnel perform corrective maintenance tasks?

5. were EPICS personnel able to perform more technical PMS after attending ETT school?

6. did ETT increase EPICS personnel troubleshooting ability?

7. is it an advantage to the work center to evaluate personnel before they are designated FTMs?

9. does on-the-job training of EPICS personnel refresh your electronics knowledge?

10. does on-the-job training of EPICS personnel add interest to your job?

11. do EPICS personnel require an acceptable amount of time for on-the-job training?

12. do most EPICS personnel seem to be adjusted to shipboard life?

13. do EPICS personnel perform their shipboard duties in a responsible manner?

14. did EPICS personnel adjust quickly to shupboard life after returning from ETT?

15. do non-EPICS personnel in your work center use JPAs?

16. are EPICS personnel required to use a JPA when performing PMS?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

17. do EPICS personnel use an MRC instead of a JPA for the same task?

18. does having JPAs make you more confident in assigning EPICS personnel to certain tasks?

19. do JPAs contain all the information needed to do the job?

20. do JPA pages get lost, torn, or dirty?

21. are the JPA location pictures an improvement over the MRC?

22. is a JPA easier for EPICS personnel to follow than an MRC for the same task?

23. did EPICS personnel use JPAs the first time they performed weekly or monthly scheduled maintenance tasks?

24. are EPICS personnel currently using JPAs when they perform weekly or monthly scheduled maintenance tasks?

25. did EPICS personnel use JPAs the first time they performed quarterly, semi-annually, or annually scheduled maintenance tasks?

26. are EPICS personnel currently using JPAs when they perform quarterly, semi-annually, or annually scheduled maintenance tasks?

27. do EPICS personnel use JPAs for unscheduled maintenance?

28. are EPICS personnel performing maintenance tasks for which JPAs are not provided?

29. is the EPICS Administration Guide useful to you in answering questions about the EPICS program?

30. does the EPICS Administration Guide lack sufficient detail?

31. is it difficult to find information in the EPICS Administration Guide?

32. does the EPICS Administration Guide explain how to operate the instructional system aboard ship?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

33. does the EPICS Project Development Office keep you adequately supplied with forms and instructional materials?

34. does the NPRDC Fleet Representative/EPICS Project Development Office provide adequate support to you in your role as an EPICS Administrator?

35. do you feel an EPICS Fleet Representative is necessary throughout the test period?

36. do you feel an EPICS Fleet Representative is necessary when EPICS sailors are senior personnel in the work center?

37. has the EPICS Fleet Representative adequately briefed you on EPICS Administrator duties and knowledge of the program?

After EPICS sailors returned from ETT school, to what extent . . .

38. are there errors in the ETD (green) instructional modules?

39. is there adequate storage space for your instructional modules?

40. are the comprehensive tests easy to administer and score?

41. do instructional materials become lost, torn, or dirty?

42. do you have enough time to answer questions of EPICS sailors on their self-instructional materials?

43. is the amount of study required of EPICS sailors realistic?

44. do non-EPICS people in your work center use the ETD instructional modules?

45. do the ETD instructional modules include job relevant information?

46. do EPICS sailors have time to study the instructional modules during the working day?

47. do EPICS sailors have difficulty understanding or using the instructional modules?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

48. do you feel it is necessary for supervisors/senior personnel to encourage EPICS personnel to study their modules?

49. do you believe the EPICS career path is well-suited for training NSSMS technicians?

Open-ended Questions

Briefly, what other rates, systems, and/or divisions could benefit from using an EPICS-like career path? Why?

_____

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Additional Comments

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FEEDBACK FORM INSTRUCTIONS

1. This feedback form is designed to find out how you are getting along so far in the Navy. This is not a test and there are no "right" or "wrong" answers.

2. The answer sheet is designed to be recorded by a machine. Answer the questions by marking your choices in the spaces on the answer sheet, as illustrated in the following example:

    To what extent . . .

    1. do you like working for the Navy?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	▓	:: ::
1	2	3	4	5

3. Please use a soft pencil, and observe carefully these important requirements:

    *Make heavy black marks that fill the spaces.
    *Erase clearly any answer you wish to change.
    *Make no stray markings of any kind.

4. When you have finished, seal the answer sheet and the feedback form in the self-addressed envelope provided. Give this to your EPICS Administrator for mailing or pick-up by the EPICS Field Representative.

Feedback Form S-1

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

1. do you feel your job contributes to the total mission of the ship?

2. do you feel that you chose the wrong rating in the Navy?

3. are you satisfied with your present work center assignment?

4. do you enjoy the work that you do in the Seasparrow work center?

5. do you take pride in your work?

6. are you satisfied with your choice of the EPICS program?

7. do you feel a sense of achievement in your job?

8. do you feel a sense of personal growth in your job?

9. do you feel you are informed enough about your job performance?

10. is it important to you to advance through EPICS as quickly as possible?

11. do you try your best in carrying out your job?

12. are you assigned more general duties (compartment cleaning, paint chipping, etc.) than technical tasks?

13. do you feel like a "go-fer"?

14. is shipboard living hard to get used to?

15. do you feel lost and confused?

16. are you told exactly what to do?

17. are you able to work at your own pace?

18. do you perform difficult and demanding work?

19. do you feel part of your work team?

20. are there good working conditions?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent. . .

21. are you treated in a fair manner?

22. are you praised for good work?

23. is there friendliness between shipboard co-workers?

24. are you learning skills that will be useful later in your enlistment?

25. can you use your free time for things you like to do?

26. are your abilities used?

27. is there freedom to set your own work goals?

28. are more senior people in your work center open to questions?

29. are there strict rules of behavior?

30. do you spend enough time studying to learn your job?

31. are you able to do your best in carrying out your job?

32. is reenlisting important to you?

33. is making the Navy a career important to you?

34. is finishing your enlistment important to you?

35. do you think you would have better job opportunities as a civilian than you have in the Navy?

36. are you satisfied that you chose to join the Navy over other organizations?

37. do you like working for the Navy?

38. is working for the Navy a mistake?

39. do you feel loyalty to the Navy?

40. do you feel an important part of the Seasparrow work center?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

41. do you have confidence in the people in your work center?

42. do the people in your work center maintain high standards of performance?

43. do the people in your work center encourage each other to give their best effort?

44. are you learning job skills from people coaching you while doing your work?

45. do your work center people function as a team?

46. do you get along with the people in your work center who are not in the EPICS program?

47. does the NSSMS work center provide you with a chance to develop skills?

48. is there good communication between work center members?

49. is there a cooperative effort among work center people?

50. are your co-workers impressed with the work you do?

51. do your co-workers think you have enough training?

52. do your co-workers think you do more than your share of the work?

53. do your co-workers make you feel that you're not good enough to work there?

54. do your co-workers make you feel that your work is important?

55. are personal or family problems interfering with your Navy career?

56. is Navy life more interesting than civilian life?

57. are you satisfied with the Navy?

58. are your living conditions adequate for your needs?

59. have your Navy experiences helped you to develop a sense of responsibility?

60. have your Navy experiences improved your personal development?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

61. did you have to repeat instructional modules in order to pass them?

62. is your study area poorly lit?

63. do you have adequate storage space for your instructional modules?

64. do you have a good place to study your instructional modules?

65. is your study area too noisy?

66. are you interrupted when studying your instructional modules?

67. is it clear what you are supposed to learn from the instructional modules?

68. are there errors in your instructional modules?

69. have the instructional modules prepared you for advancement in rate?

70. are the instructional modules helping you to complete your Personnel Qualification Standard (PQS) for the NATO Seasparrow System?

71. are you able to study often enough?

72. do you experience delays in getting your comprehensive test scored?

73. do you have adequate time to complete the instructional modules at your own pace?

74. are the instructional modules difficult to read?

75. are the instructional modules too repetitive?

76. do the instructional module tests measure your knowledge?

77. do the instructional modules go into enough detail?

78. do the instructional modules require reasonable standards of performance?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

79. do you need help when using JPAs?

80. are you asked to show other people in your work center how to use the JPAs?

81. are the job performance aids (JPAs) hard to understand?

82. are too many JPAs required to do one job?

83. are the JPAs correct?

84. are the JPA pictures hard to follow?

85. are you satisfied with using JPAs for all your maintenance work?

86. would you want to have the help of JPAs if you changed jobs?

87. do JPAs contain all the information you need to do the job?

88. is it necessary for more introductory training in the use of JPAs?

EPICS PROJECT DEVELOPMENT OFFICE - CODE 309B
NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER
San Diego, CA 92152

EPICS SAILOR FEEDBACK FORM S-2

Instructions

1. This feedback form is designed to determine your opinion of various aspects
of the EPICS program. Since you have been in the EPICS program for approxi-
mately one year, your first hand experiences are most important in evaluating
the program. This is not a test and there are no "right" or "wrong" answers.
This form should be completed after your arrival at Equipment Technician
Training (ETT) school or after you have been aboard ship for 12 months. It
will require less than 10 minutes of time.

2. The answer sheet provided is designed to be scored by a machine. Answer
the questions by marking your choices in the spaces on the answer sheet as
illustrated in the following example:

To what extent . . .

1. do you feel you understand the basic goals of the EPICS program?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
1	2	3	4	5

In the example, Response 4 has been blacked-in indicating that the respondent
feels he understands the basic goals of the EPICS program to a great extent.

3. Since the feedback form refers to your entire time in the EPICS program,
preface each question with "generally" or "on the average". For example,
"Generally, to what extent have you had difficulty using the instructional
modules?"

4. Please use a soft pencil, and observe carefully these important requirements:

    *Make heavy black marks that fill the spaces.
    *Erase clearly any answer you wish to change.
    *Make no stray markings of any kind.

5. At the end of the form, space is provided for you to enter any comments you
may wish to make on any of the questions or about any aspect of the EPICS program.

6. When you have finished, seal the answer sheet and the feedback form in the
self-addressed envelope provided. Either mail or give it to the EPICS Field
Representative. Thank you very much for your feedback.

A-21

Feedback Form S-2

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
::	::	::	::	::
1	2	3	4	5

To what extent . . .

1. do you feel your job contributes to the total mission of the ship?

2. do you feel that you chose the wrong rating in the Navy?

3. do you enjoy the work that you do in the Seasparrow work center?

4. do you take pride in your work?

5. are you satisfied with your choice of the EPICS program?

6. do you feel a sense of achievement in your job?

7. do you feel you are informed enough about your job performance?

8. is it important to you to advance through EPICS as quickly as possible?

9. are you assigned more general duties (compartment cleaning, paint chipping, etc.) than technical tasks?

10. do you feel lost and confused?

11. are you told exactly what to do?

12. are you able to work at your own pace?

13. do you perform difficult and demanding work?

14. do you feel part of your work team?

15. are there good working conditions?

16. are you treated in a fair manner?

17. are you praised for good work?

18. is there friendliness between shipboard co-workers?

19. are you learning skills that will be useful later in your enlistment?

20. can you use your free time for things you like to do?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
::	::	::	::	::
1	2	3	4	5

To what extent . . .

21. are your abilities used?

22. is there freedom to set your own work goals?

23. are more senior people in your work center open to questions?

24. do you spend enough time studying to learn your job?

25. are you able to do your best in carrying out your job?

26. is making the Navy a career important to you?

27. do you think you would have better job opportunities as a civilian than you have in the Navy?

28. are you satisfied that you chose to join the Navy over other organizations?

29. do you feel loyalty to the Navy?

30. do you feel an important part of the Seasparrow work center?

31. do you have confidence in the people in your work center?

32. do the people in your work center encourage each other to give their best effort?

33. are you learning job skills from people coaching you while doing your work?

34. do your work center people function as a team?

35. do you get along with the people in your work center who are not in the EPICS program?

36. does the NSSMS work center provide you with a chance to develop skills?

37. is there good communication between work center members?

38. do your co-workers think you have enough training?

39. do your co-workers make you feel that your work is important?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

40. are personal or family problems interfering with your Navy career?

41. is Navy life more interesting than civilian life?

42. are your living conditions adequate for your needs?

43. have your Navy experiences helped you to develop a sense of responsibility?

44. have your Navy experiences improved your personal development?

45. is your study area too noisy?

46. is it clear what you are supposed to learn from the instructional modules?

47. are there technical errors in your instructional modules?

48. have the instructional modules prepared you for advancement in rate?

49. are the instructional modules helping you to complete your Personnel Qualification Standard (PQS) for the NATO Seasparrow System?

50. do you experience delays in getting your comprehensive test scored?

51. do you have adequate time to complete the instructional modules at your own pace?

52. are the instructional modules difficult to read?

53. do the instructional module tests measure your knowledge?

54. do the instructional modules go into enough detail?

55. do the instructional modules require reasonable standards of performance?

56. are you learning job skills from studying the instructional modules on your own?

57. do the instructional modules help you understand JPAs?

58. do you need help when using JPAs?

59. are you asked to show other people in your work center how to use the JPAs?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

60. are the job performance aids (JPAs) hard to understand?

61. are too many JPAs required to do one job?

62. are the JPAs correct?

63. are the JPA pictures hard to follow?

64. are you satisfied with using JPAs for all your maintenance work?

65. would you want to have the help of JPAs if you changed jobs?

66. do JPAs contain all the information you need to do the job?

67. is it necessary for more introductory training in the use of JPAs?

68. do the JPAs help you understand the training modules?

69. do you refer to the EPICS Sailor Handbook?

70. is the EPICS Sailor's Handbook useful to you in answering questions about the EPICS program?

71. are you using the EPICS Sailor's Handbook to record your career progress?

72. has the EPICS Sailor's Handbook helped you understand the use of JPAs?

73. has the EPICS Sailor's Handbook helped you understand how to use your individualized modularized instruction?

EPICS Sailor's Comments

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NSSMS PERSONNEL FEEDBACK FORM C-2

Instructions

1. This feedback form is designed to determine your opinion of various aspects of the EPICS program and Navy life. Every NSSMS work center with EPICS sailors will also complete the same feedback form as you. This is not a test and there are no "right" or "wrong" answers. It will require less than 10 minutes of your time. Your answers are completely confidential.

2. The answer sheet provided is designed to be scored by a machine. Answer the questions by marking your choices in the spaces on the answer sheet as illustrated in the following example:

To what extent . . .

1. is reenlisting important to you?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
∷	∷	∷	▋	∷
1	2	3	4	5

In the example, Response 4 has been blackened-in indicating that the respondent feels he wants to reenlist to a great extent.

3. Preface each people-related question with "generally" or "on the average". For example, "Generally, to what extent are senior personnel open to questions?"

4. Please use a soft pencil, and observe carefully these important requirements:

   *Make heavy black marks that fill the spaces.
   *Erase clearly any answer you wish to change.
   *Make no stray markings of any kind.

5. At the end of the form, space is provided for you to enter any comments you may wish to make on any of the questions or about any aspect of the EPICS program.

6. When you have finished, seal the answer sheet and the feedback form in the self-addressed envelope provided. Either mail or give it to the EPICS Field Representative. Thank you very much for your feedback.

Feedback Form C-2

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

1. do you feel your job contributes to the total mission of the ship?

2. do you feel that you chose the wrong rating in the Navy?

3. do you enjoy the work that you do in the Seasparrow work center?

4. do you take pride in your work?

5. do you feel a sense of achievement in your job?

6. do you feel you are informed enough about your job performance?

7. do you try your best in carrying out your job?

8. are you assigned more general duties (compartment cleaning, paint chipping, etc.) than technical tasks?

9. do you feel like a "go-fer"?

10. is shipboard living hard to get used to?

11. do you feel lost and confused?

12. are you told exactly what to do?

13. are you able to work at your own pace?

14. do you perform difficult and demanding work?

15. do you feel part of your work team?

16. are there good working conditions?

17. are you treated in a fair manner?

18. are you praised for good work?

19. is there friendliness between shipboard co-workers?

20. are you learning skills that will be useful later in your enlistment?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

21. can you use your free time for things you like to do?

22. are your abilities used?

23. is there freedom to set your own work goals?

24. are more senior people in your work center open to questions?

25. are there strict rules of behavior?

26. do you spend enough time studying to learn your job?

27. are you able to do your best in carrying out your job?

28. is reenlisting important to you?

29. is making the Navy a career important to you?

30. is finishing your enlistment important to you?

31. do you think you would have better job opportunities as a civilian than you have in the Navy?

32. are you satisfied that you chose to join the Navy over other organizations?

33. do you feel loyalty to the Navy?

34. do you feel an important part of the Seasparrow work center?

35. do you have confidence in the people in your work center?

36. do the people in your work center encourage each other to give their best effort?

37. do your work center people function as a team?

38. do you get along with the people in your work center who are in the EPICS program?

39. does the NSSMS work center provide you with a chance to develop skills?

40. is there good communication between work center members?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

41. do your co-workers think you have enough training?

42. do your co-workers make you feel that your work is important?

43. do EPICS sailors perform corrective maintenance tasks?

44. do EPICS sailors perform as well as a new "A" school graduate?

45. are personal or family problems interfering with your Navy career?

46. is Navy life more interesting than civilian life?

47. are you satisfied with the Navy?

48. are your living conditions adequate for your needs?

49. have your Navy experiences helped you to develop a sense of responsibility?

50. have your Navy experiences improved your personal development?

51. do you need help when using Maintenance Requirement Cards (MRCs)?

52. do EPICS sailors ask you how to use the MRCs?

53. are the MRCs easily lost?

54. have you had difficulty in getting the MRCs needed for your job?

55. are MRCs available to help you on all the jobs you are assigned?

56. are the MRCs hard to understand?

57. are too many MRCs required to do one job?

58. are the MRCs correct?

59. are the MRC pictures hard to follow?

60. are you satisfied with using MRCs for all your maintenance work?

61. do MRCs contain all the information you need to do the job?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
::	::	::	::	::
1	2	3	4	5

To what extent . . .

62. do the MRCs help you to become a useful member of your work center team?

63. is it necessary for more introductory training in the use of MRCs?

64. have MRC pages been lost, torn, or dirty?

65. are MRCs easy to handle while working?

66. have you had difficulty getting replacement MRCs?

67. have you had difficulty getting MRCs updated?

68. do you use EPICS Job Performance Aids (JPAs) while performing maintenance?

69. do JPAs contain all the information you need to do the job?

70. do you use EPICS instructional modules (e.g., Job Indoctrination, Apprentice Technician Duty)?

71. are you learning job-related skills and knowledge from studying the EPICS instructional modules?

72. do you have time to study rate training manuals?

73. do you have time to study the ordnance publications (e.g., OPs, FOIDS)?

74. is there time for additional technical training materials for the NSSMS?

75. is there time for additional general military training?

76. would you have time to study instructional modules as part of an on-going shipboard training program?

Please indicate your answer to the following questions by blackening the corresponding number on the answer sheet.

77. How long have you been in the Navy?

    (1) 0-12 months
    (2) 1-2 years
    (3) 2-3 years
    (4) 3-4 years
    (5) More than 4 years

78. How long have you been assigned to this ship?

    (1) 0-6 months
    (2) 7-12 months
    (3) 1-2 years
    (4) 2-3 years
    (5) 3-4 years

79. What is your current rate?

    (1) Non-designated
    (2) PO3
    (3) PO2
    (4) PO1
    (5) CPO/SCPO/MCPO

80. If a Gunner's Mate, which schools have you completed? (Fill in more than one response if necessary)

    (1) None
    (2) BE&E
    (3) GM "A" School
    (4) NSSMS Launcher "C" School
    (5) Other "C" Schools

81. If a Fire Control Technician, which schools have you completed (Fill in more than one response if necessary)

    (1) None
    (2) BE&E
    (3) FT "A" School, Phase I
    (4) NSSMS "C" School
    (5) Other "C" Schools

Comments:

_____

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NON-EPICS NSSMS PERSONNEL FEEDBACK FORM C-3

Instructions

1. This feedback form asks NSSMS personnel not enrolled in EPICS about various aspects of the EPICS program and Navy life. Every NSSMS work center with EPICS sailors will also complete the same feedback form as you. This is not a test and there are no "right" or "wrong" answers. It will require about 15 minutes of your time. Your answers are completely confidential. Do not identify yourself.

2. Answer the questions by marking your choices in the spaces on the answer sheet as illustrated in the following example:

To what extent . . .

1. is reenlisting important to you?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	∎	:: ::
1	2	3	4	5

In the example, Response 4 has been blackened-in indicating that the respondent feels he wants to reenlist to a great extent.

3. Preface each people-related question with "generally" or "on the average". For example, "Generally, to what extent are senior personnel open to questions?"

4. Please use a soft pencil, and observe carefully these important requirements:

 *Make heavy black marks that fill the spaces.
 *Erase clearly any answer you wish to change.
 *Make no stray markings of any kind.

5. When you have finished, seal the answer sheet and the feedback form in the self-addressed envelope provided and mail to the EPICS Project Office. Thank you.

Feedback Form C-3

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

1. do you feel your job contributes to the total mission of the ship?

2. do you feel that you chose the wrong rate in the Navy?

3. are you satisfied with your present work center assignment?

4. do you enjoy the work that you do in the Seasparrow work center?

5. do you take pride in your work?

6. do you feel a sense of achievement in your job?

7. do you feel you are informed enough about your job performance?

8. do you try your best in carrying out your job?

9. do you feel your skills are increasing as an NSSMS technician?

10. are you generally satisfied with the Navy?

11. is finishing your enlistment important to you?

12. is reenlisting important to you?

13. is making the Navy a career important to you?

14. is working for the Navy a mistake?

15. do you feel loyalty to the Navy?

16. do you think you would have better job opportunities as a civilian than you have in the Navy?

17. are you satisfied that you chose to join the Navy over other organizations?

18. do you have confidence in the people in your work center?

19. do the people in your work center maintain high standards of performance?

20. do the people in your work center encourage each other to give their best effort?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

21. do your work center people function as a team?

22. does the NSSMS work center provide you with a chance to develop job skills?

23. is there good communication between work center members?

24. are co-workers satisfied with your work?

25. do co-workers make you feel your work is important?

26. do you get along with the people in your work center?

27. do you like working for the Navy?

28. do EPICS personnel perform corrective maintenance tasks?

29. were EPICS personnel able to perform more technical PMS after attending ETT school?

30. did ETT increase EPICS personnel troubleshooting ability?

31. is it an advantage to the work center to evaluate personnel before they are designated FTMs?

32. does on-the-job training of EPICS personnel refresh your electronics knowledge?

33. does on-the-job training of EPICS personnel add interest to your job?

34. do EPICS personnel require an acceptable amount of time for on-the-job training?

35. are the MRCs hard to understand?

36. are MRCs too simple?

37. are the MRCs correct?

38. are there enough MRC pictures?

39. are the MRC pictures hard to follow?

40. do the MRCs contain all the information for all your maintenance work?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

To what extent . . .

41. have MRCs pages been lost, torn, or dirty?

42. are MRCs easy to handle while working?

43. have you had difficulty getting replacement MRCs?

44. have you had difficulty getting MRCs updated?

45. are the JPAs easier for EPICS personnel to follow than an MRC for the same task?

46. did EPICS personnel use JPAs the first time they performed weekly or monthly scheduled maintenance tasks?

47. are EPICS personnel currently using JPAs when they perform weekly or monthly scheduled maintenance tasks?

48. did EPICS personnel use JPAs the first time they performed quarterly, semi-annually, or annually scheduled maintenance tasks?

49. are EPICS personnel currently using JPAs when they perform quarterly, semi-annually, or annually scheduled maintenance tasks?

50. do EPICS personnel use JPAs for unscheduled maintenance?

51. are EPICS personnel performing maintenance tasks for which JPAs are not provided?

52. have you used EPICS JPAs while performing maintenance?

53. do JPAs contain all the information needed to do the job?

54. are the JPA location pictures an improvement over the MRCs?

55. do you have time to study rate training manuals?

56. do you have time to study the ordnance publications (e.g., OPs, FOIDS)?

57. is there time for additional technical training materials for the NSSMS?

58. is there time for additional general military training?

59. would you have time to study instructional modules as part of an on-going shipboard training program?

60. have you studied the ETD (green) EPICS modules?

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
∷	∷	∷	∷	∷
1	2	3	4	5

To what extent . . .

61. are the ETD modules a useful training aid for you?

62. did having non-rated EPICS personnel performing scheduled PMS provide you more time for unscheduled maintenance and troubleshooting?

63. would you have preferred "hands-on" experience with the NSSMS before reporting to school?

64. do you believe the EPICS career path is well suited for training NSSMS technicians?

Please indicate your answer to the following questions by blackening the corresponding number on the answer sheet.

65. How long have you been in the Navy?

    (1)   Less than 1 year
    (2)   1-2 years
    (3)   2-3 years
    (4)   3-4 years
    (5)   More than 4 years

66. How long have you been assigned to this ship?

    (1)   0-6 months
    (2)   7-12 months
    (3)   1-2 years
    (4)   2-3 years
    (5)   3-4 years

67. What is your current rating?

    (1)   Non-designated
    (2)   PO3
    (3)   PO2
    (4)   PO1
    (5)   CPO/SCPO/MCPO

To a Very Little Extent	To a Little Extent	To Some Extent	To a Great Extent	To a Very Great Extent
:: ::	:: ::	:: ::	:: ::	:: ::
1	2	3	4	5

For items 68 through 75, indicate your answers by blackening "1" for Yes, and "2" for No.

If a Gunner's Mate, have you completed:

68. BE&E

69. GM "A" School

70. NSSMS Launcher "C" School

71. Other "C" Schools

If a Fire Control Technician, have you completed:

72. BE&E

73. FT "A" School, Phase I

74. NSSMS "C" School

75. Other "C" Schools

Open ended questions

What other rates, systems, and/or divisions could benefit from using an EPICS-like career path? Why?

_____

_____

_____

_____

_____

_____

Additional Comments

_____

_____

_____

_____

_____

_____

EPICS SAILOR CAREER MANAGEMENT FORM

Name _____ Rate _____ SSN _____-____-_____ Date Reported _____/_____/_____

Ship/Hull No. _____ Home Port _____ EPICS Administrator _____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
Ship Indoctrination (SI)			
SI 1.0 Ship Locations, Schedules and Procedures. (See worksheet in EPICS Administration Guide)	____/____/____	[ ]	Make sure berthing is arranged for EPICS sailor prior to his arrival.
SI 2.0 Common Shipboard Hazards and Safety Precautions.	____/____/____	[ ]	If possible, personally welcome EPICS sailor on board first day.
SI 3.0 Introduction to Life Aboard Ship	____/____/____	[ ]	If possible, do not assign EPICS sailor to mess cooking during first month on board.
SI 4.0 Common Requirements of Maintenance Personnel	____/____/____	[ ]	It is recommended that EPICS sailor be assigned full time to the SI modules dur-his first week on obard.
SI 5.0 U.S. Navy Regulations, Personal Improvement and Preliminary Introduction to Tools	____/____/____	[ ]	
SI Comprehensive Test	____/____/____		
General Military			
Damage Control PQS Cards	____/____/____	[ ]	Issue Damage Control and 3M PQS Cards to EPICS sailor.
3M PQS Cards	____/____/____	[ ]	

Name _____ Rate _____ SSN ____-__-____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
General Military (Cont.)			
Basic Military Requirements Course Materials	___/___/___	[ ]	Ensure EPICS sailor has ordered Basic Military Requirements and Seaman Course Materials.
Seaman Course Materials	___/___/___	[ ]	
Job Indoctrination (JI)			
JI 1.0 General Safety Procedures	___/___/___	[ ]	It is recommended that EPICS sailor be assigned a two-hour training period each day.
JI 2.0 General and Electrical Tools	___/___/___	[ ]	
JI 3.0 Shipboard Maintenance and Record Keeping	___/___/___	[ ]	It is expected that EPICS sailor be assigned to 2-3 months mess cooking.
JI 4.0 Maintenance Aids and Documents	___/___/___	[ ]	
JI Comprehensive Test	___/___/___		
General Military			
Advanced to Seaman Apprentice	___/___/___	[ ]	If time in service is greater than six months, sailor should be ready to advance to Seaman Apprentice (E-2).

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Name _____   Rate _____   SSN _____-____-_____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes

Apprentice Technician Duty (ATD)

ATD 1.0 Introduction to NATO Seasparrow Surface Missile System	___/___/___	[ ]	It is recommended that EPICS sailor be assigned a two-hour training period each day.
ATD 2.0 NSSMS Fire Control System Functional Review	___/___/___	[ ]	
ATD 3.0 NSSMS Guided Missile Launcher System Functional Review	___/___/___	[ ]	After completion of respective ATD lessons, it is recommended that EPICS sailor be allowed to turn-on NSSMS, shut-down NSSMS, and operate RSC during normal air tactical operation by using Operator Job Aids ATD 4.1, 4.2 and 4.3
ATD 4.0 NSSMS Turn-On and Shut-Down Procedures	___/___/___	[ ]	
ATD Comprehensive Test 1, Modules 1-4	___/___/___		Sailor should prepare to take the Seaman Test when it is first offered during ATD. By passing the test, he will have fulfilled a major requirement for advancement to Seaman. If he does not pass, this will give him enough time to retake the test with little delay in his career.
ATD 5.0 NSSMS Basic Air Target System Operation	___/___/___	[ ]	
ATD 6.0 Test Equipment Operation	___/___/___	[ ]	
ATD Comprehensive Test 2, Moudles 5 & 6	___/___/___		

Apprentice Technician Duty, ETTP Modules

ETTP 1.0 Basic Voltage and Current Measurement in a Simple Circuit	___/___/___	[ ]	Equipment Technician Training (Prep) Modules 1-14 must be completed prior to being sent to ETT school.

A-43

Name _____ Rate _____ SSN _____-____-_____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
Apprentice Technician Duty, ETTP Modules (Cont.)			
ETTP 2.0 Relationship of Voltage, Current and Resistance	___/___/___	[ ]	It is recommended that EPICS sailor be assigned a two-hour training period each day.
ETTP 3.0 Use of the Simpson 260-5P Multimeter	___/___/___	[ ]	Notify EPICS Program Development Office when EPICS sailor has completed ETTP module 10. Arrangements for EPICS sailor to take ETT Prerequisite Test will be made.
ETTP 4.0 Variational Analysis of D-C Circuits	___/___/___	[ ]	
ETTP 5.0 Parallel Circuits	___/___/___	[ ]	If the decision is NOT to recommend the EPICS sailor for ETT, inform the EPICS Program Development Office.
ETTP 6.0 Combination D-C Circuits	___/___/___	[ ]	
ETTP 7.0 Special D-C Circuits	___/___/___	[ ]	
ETTP Comprehensive Test 1, Modules 1-7	___/___/___		
ETTP 8.0 Introduction to A-C Test Equipment	___/___/___	[ ]	
ETTP 9.0 Introduction to Inductors	___/___/___	[ ]	
ETTP 10.0 Transformer Identification and Operation	___/___/___	[ ]	
ETTP 11.0 Introduction to Capacitors and RC/RL Time Constants	___/___/___	[ ]	
ETTP 12.0 RL and RC Filters	___/___/___	[ ]	

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Name _____ Rate _____ SSN _____-____-_____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
Apprentice Technician Duty, ETTP Modules (Cont.)			
ETTP 13.0 Series Resonance Circuits	___/___/___	[ ]	
ETTP 14.0 Parallel Reactive Circuits	___/___/___	[ ]	
ETTP Comprehensive Test 2, Modules 8-14	___/___/___		
General Military			
Seaman Test	___/___/___		If time in service is greater than one year, sailor should be ready to advance to Seaman (E-3).
Advanced to Seaman	___/___/___	[ ]	
Military Requirements for Petty Officer 3 & 2 Course Materials	___/___/___	[ ]	Ensure EPICS sailor has ordered Navy training courses required for E-4.
Fire Controlman 3 & 2 Course Materials	___/___/___	[ ]	
Equipment Technician Training, Modules 40-44			
ETT 40.0 Number Systems	___/___/___	[ ]	After EPICS sailor has completed Modules 40-44 Comprehensive Test, notify EPICS Program Development Office and a certificate of completion will be issued to the EPICS sailor.
ETT 40.1 Basic Digital Logic	___/___/___	[ ]	
ETT 40.2 Boolean Algebra	___/___/___	[ ]	
ETT 40.3 Registers and Counters	___/___/___	[ ]	

A-45

Name _____ Rate _____ SSN _____ - ___ - _____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
Equipment Technician Training, Modules 40-44 (Cont.)			
ETT 40.4 Displays and Outputs	___/___/___	[ ]	
ETT Comprehensive Test, Modules 40-44	___/___/___	[ ]	
General Military			
Military Leadership Exam for E-4	___/___/___	[ ]	
PAR for E-4	___/___/___	[ ]	
Equipment Technician Duty (ETD)			
ETD 1.0 Introduction to System Troubleshooting	___/___/___	[ ]	It is recommended that EPICS sailor be assigned a two-hour training period each day.
ETD 2.0 NSSMS DSOT and FOC Bit Off-Line Test Procedures	___/___/___	[ ]	After completion of respective ETD lessons, it is recommended that EPICS sailor
ETD 3.0 RSC and RTDP Off-Line Test Procedures	___/___/___	[ ]	be allowed to conduct RSC in Local Search with Computer operative, to conduct RSC in Track and Engage Air Target with Computer
ETD 4.0 NSSMS GMFCS Bit Off-Line Test Procedures: II	___/___/___	[ ]	casualty, and conduct RSC in Track and Observe Surface Target with Computer operative or Computer casualty by using Opera-
ETD 5.0 NSSMS Guided Missile Launching System (GMLS) Test and Trouble-shooting Procedures	___/___/___	[ ]	tor Job Aids ETD 6.1, 7.1 and 7.2.

Name _____ Rate _____ SSN _____-___-_____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
Equipment Technician Duty (ETD) (Cont.)			
ETD Comprehensive Test 1, Modules 1-5	___/___/___		
ETD 6.0 Operator Procedures: Part III	___/___/___	[ ]	
ETD 7.0 Operator Procedures: Part IV	___/___/___	[ ]	
ETD 8.0 Operator Procedures: Part V	___/___/___	[ ]	
ETD Comprehensive Test 2, Modules 6-8	___/___/___		
Equipment Technician Duty, STTP Modules			
STTP 1.0 Introduction to Generators	___/___/___	[ ]	It is recommended that EPICS sailor be assigned a two-hour training period each day.
STTP 2.0 Introduction to Motors	___/___/___	[ ]	
STTP 3.0 Introduction to Synchros and Resolvers	___/___/___	[ ]	Request System Technician Training billet from EPICS Program Development Office when EPICS sailor has completed STTP modules.
STTP 4.0 Introduction to Servos and Electromechanical Devices	___/___/___	[ ]	Request must arrive 30 days prior to desired class convening date.
STTP Comprehensive Test 1, Modules 1-4	___/___/___		EPICS sailor must meet obligated service requirement in order to attend System Technician Training.
STTP 5.0 Role of Radar in Combat Weapon Systems	___/___/___	[ ]	
STTP 6.0 Radar Fundamentals	___/___/___	[ ]	

A-47

Name _____ Rate _____ SSN _____ - ____ - _____

EPICS Program Events and Navy Requirements	Date Completed	Reported on EPICS Monthly Report	Notes
Equipment Technician Duty, STTP Modules (Cont.)			
STTP 7.0 Introduction to CW Doppler Radar Systems	___/___/___	[ ]	
STTP Comprehensive Test 2, Modules 5-7	___/___/___	[ ]	
STTP 8.0 NSSMS Fire Control and Launching Systems	___/___/___	[ ]	
STTP 9.0 NSSMS Computer Complex	___/___/___	[ ]	
STTP 10.0 Course Preparation Review and orientation	___/___/___	[ ]	
STTP Comprehensive Test 3, Modules 8-10	___/___/___	[ ]	
General Military			
FC-3 Navy-wide Test	___/___/___		
Advanced to FC-3	___/___/___	[ ]	
Military Leadership Exam for E-5	___/___/___		
PAR for E-5	___/___/___	[ ]	
FC-2 Navy-wide Test	___/___/___		
Advanced to FC-2	___/___/___	[ ]	

A-48

EPICS Shipboard Interview Questions

Ship: _____ Date: _____

Personnel Interviewed: EPICS _____

Administrator _____

Conventional _____

Nearest Major Evolution _____

EPICS Administrator

			Rate	
			FTMs	GMMs
Breakdown of Work Center Personnel:				
		EPICS	___	___
Total # _____	School	Phase I "A" only	___	___
	Training	Up through "C"	___	___

Any strikers? _____   Any ETT Graduates? _____

Is this adequate manning to cover work load?

Do you have a satisfactory ratio of GMMs and FTMs?

Is there enough scheduled maintenance to provide EPICS sailors regular opportunities to work on the equipment?

What are your general impressions of EPICS?

What are the advantages and disadvantages of EPICS for the:

     (a) EPICS sailor -

     (b) Work Center -

     (c) Ship -

     (d) Navy -

How do you use the Administration Guide?

Do you feel the duties as Administrator are manageable as a collateral duty? What is the paperwork load like?

Did the Fleet Representative help you in managing EPICS? Do you feel a Fleet Rep is necessary throughout the test period?

What kind of support has the EPICS project received from your chain of command (Div. Officer, XO, etc.)?

Do you think a brief (1-2 days) administrator training course would have prepared you quite a bit better for your administrator responsibilities?

Do you think a semi-annual meeting of administrators would help to keep you prepared?

How much have you had to change the work process to accommodate the EPICS sailors? How do your EPICS sailors compare to "A" school graduates in terms of supervision and OJT?

Have any of the EPICS sailors considered striking for other rates? What was outcome?

Is the deferred training period an advantage for the WC in terms of screening personnel? Are "C" school graduates adequately screened before reporting to ship?

What kind of maintenance are "A" school graduates assigned during their first year aboard? Does shipboard life and mess cooking set them back in terms of the skills learned in school?

What kind of maintenance are "C" school graduates assigned their first year aboard ship? How long before they perform unscheduled maintenance and trouble-shooting?

What kind of maintenance have the EPICS sailors performed?

Do you have all the JPAs? How do you store them? Were the JPAs received before EPICS sailors reported aboard?

Are the EPICS sailors using the JPAs for scheduled maintenance? Unscheduled maintenance?

In what proportion of maintenance tasks do EPICS sailors use MRCs? How many times was the JPA used, on the average, before transition to the same MRC?

Would you change the JPAs? How?

Do you have all the modules? How do you store them? Were the modules always received before EPICS sailors progressed far enough to study them?

Is there time available during an average work day for EPICS sailors to study their modules? Do they usually use this time to study?

Do EPICS sailors have to review earlier modules in a series when preparing to take a "comp" test? What is normal testing procedure?

How would you improve/modify the modules? Which are the best? Worst? Why? Have you recommended any modules to non-EPICS personnel?

What is your procedure for judging statisfactory module completion?

Can the ETT-Prep modules be completed on the ship? Any special equipment needed?

Has your Division Officer shared any of the duties related to EPICS such as assessment as to whether they attend ETT?

Did it affect the WC work load when EPICS sailors went to ETT?

Is there a noticeable increase in the complexity of tasks which the ETT students are now able to perform?

Were any ETT modules brought back to the ship? If so, are they difficult to complete? Why?

EPICS Sailors

What are your general impressions of EPICS?

What are the advantages and disadvantages of EPICS for the:

    (a) EPICS sailor -

    (b) Work Center -

    (c) Ship -

    (d) Navy -

Do you maintain a log in your Sailor's Handbook? Does the Sailor's Handbook explain your career path adequately?

In what ways did the Fleet Rep. assist you?

Has the Work Center had to change the work process to accommodate you? How do you compare to "A" school graduates in terms of supervision and OJT?

Have any of the EPICS sailors considered striking for other rates? What was outcome?

Is there enough scheduled maintenance to provide EPICS sailors regular opportunities to work on the equipment?

What kind of maintenance have you performed?

Are you using the JPAs for scheduled maintenance? Unscheduled
maintenance?

For what proportion of maintenance tasks do you use MRCs? How many times was
the JPA used, on the average, before transitioning to the same MRC?

Are you teased about using the JPAs?

Does your administrator/WC sup require you to use them at least once?

Would you change the JPAs? How?

Is there time available during an average work day for you to study the
modules? Do you usually use this time to study?

Do you have to review earlier modules in a series when preparing to take a "comp"
test? What is normal testing procedure?

How would you improve/modify the modules? Which are the best? Worst? Why?
Have you recommended any modules to non-EPICS personnel?

Was it more difficult for you to study your modules during mess cooking?

Can the ETT-Prep modules be completed on the ship? Any special equipment needed?

Is there a noticeable increase in the complexity of tasks which the ETT students
are now able to perform?

Were any ETT modules brought back to the ship? If so, are they difficult to
complete? Why?

NSSMS Personnel

What are your general impressions of EPICS?

What are the advantages and disadvantages of EPICS for the:

    (a) EPICS sailor -

    (b) Work Center -

    (c) Ship -

    (d) Navy -

How much have you had to change the work process to accommodate the EPICS sailors? How do your EPICS sailors compare to "A" school graduates in terms of supervision and OJT?

Is the deferred training period an advantage for the WC in terms of screening personnel? Are "C" school graduates adequately screened before reporting to ship?

What kind of maintenance are "A" school graduates assigned during their first year aboard? Does shipboard life and mess cooking set them back in terms of the skills learned in school?

What kind of maintenance are "C" school graduates assigned their first year aboard ship? How long before they perform unscheduled maintenance and trouble-shooting?

What kind of maintenance have the EPICS sailors performed?

Are the EPICS sailors using the JPAs for scheduled maintenance? Unscheduled maintenance?

For what proportion of maintenance tasks do EPICS sailors use MRCs? How many times was the JPA used, on the average, before transitioning to the same MRC?

Did it affect the WC work load when EPICS sailors went to ETT?

Is there a noticeable increase in the complexity of tasks which the ETT students are now able to perform?

Have you used any of the JPAs? Which tasks?

Have you used any of the modules? Which ones? Why?

EPICS Shipboard Interview Questions (24-30 month point)

Ship:_____ Date:_____

Personnel Interviewed: EPICS _____
Administrator _____
Conventional _____ WC Sup/DO _____

Current Evolution _____

EPICS Administrator/WC Supervisor/DO

	Rate	
	EIMs	GMMs
Breakdown of Work Center Personnel:		
Strikers	____	____
EPICS	____	____
School Phase I "A" only	____	____
Training Up Through "C"	____	____
Number of ETT Graduates	____	____

Total # _____

Is this adequate manning to cover work load?

Do you have a satisfactory ratio of experienced to inexperienced personnel? Trained vs. untrained?

Is there enough scheduled maintenance to provide EPICS sailors reg- ular opportunities to work on the equipment?

What are your general impressions of EPICS to date?

Do you feel the duties as Administrator are manageable as a collat- eral duty? What is the paperwork load like?

Do you feel a Fleet Rep is necessary for EPICS to work throughout the test period? If implemented, do you feel each new administra- tor should be indoctrinated?

Who in your chain of command is aware of the EPICS project?

How much have you had to change the work process to accommodate the EPICS sailors?

How do your EPICS sailors compare to "A" school graduates in terms of supervision and OJT after ETT?

How many of your EPICS sailors do you expect to progress far enough to attend STT?

A year from now, how do you see the make-up of this work center in terms of training and experience?

How long before "A" school graduates perform: troubleshooting? remove and replace PMS requiring soldering? operator tasks?

How long before "C" school graduates perform: troubleshooting? remove and replace PMS requiring soldering? operator tasks?

How long before EPICS sailors perform: troubleshooting? remove and replace PMS requiring soldering? operator tasks?

For what kinds of tasks are the EPICS sailors using the JPAs?

In what proportion of maintenance tasks do EPICS sailors use MRCs?

Would you change the JPAs? Which ones? How?

A-60

Would you change the MRCs? Which ones? How?

How do you store the modules? Were the modules always received before EPICS sailors progressed far enough to study them? Changes to 40 series received?

Is there time available during an average work day for EPICS sailors to study their modules? Do they usually use this time to study?

What is your normal module testing procedure?

How would you improve/modify the modules? Which are the best? Worst? Why?

Have you recommended any modules to non-EPICS personnel? Which ones?

What is your procedure for judging satisfactory module completion?

Can the ETD (green) and STT-Prep (grey) modules be completed on the ship? Any special equipment needed?

How did it affect the work center's ability to handle the workload when EPICS sailors went to ETT? STT?

Is there a noticeable increase in the complexity of tasks which the ETT students are now able to perform?

Were any ETT modules brought back to the ship? If so, are the EPICS sailors finding them difficult to complete? Why?

EPICS Sailors

EPICS Administrator Rotation

Number of people previously
assigned to this collateral duty   _____

	Yr/Mos	Effectiveness Rating (SIP)
Approximate dates of rotation		
	_____	_____
	_____	_____
	_____	_____
	_____	_____

What are your general impressions of EPICS?

In what ways has the Fleet Rep assisted you? Do you feel a Fleet Rep is necessary throughout the test period?

Has the Work Center had to change the work process to accommodate you?

How do you compare to "A" or "C" school graduates in terms of supervision and OJT?

What kinds of maintenance are "A" school graduates assigned during their first year aboard?

What kinds of maintenance are "C" school graduates assigned during their first year aboard?

Is there enough scheduled maintenance to provide you regular opportunities to work on the equipment?

What kind of maintenance have you performed since attending ETT?

For what kinds of tasks are you using JPAs?

For what proportion of maintenance tasks do you use MRCs? How many times was the JPA used, on the average, before transitioning to the same MRC?

Has your administrator/WC sup required you to use JPAs at least once?

Is there time available/provided during an average work day for you to study the modules? Do you usually use this time to study?

How would you improve/modify the modules? Which are the best? Worst? Why?

Can the ETD (green) and STT-Prep (grey) modules be completed on the ship? Any special equipment needed?

After ETT, was there a noticeable increase in the complexity of tasks which you could/were allowed to perform?

Was electronics-related OJT easier to understand after ETT?

Were any ETT modules .brought back to the ship? If so, are they difficult to complete? Why?

Have you gone up for advancement at earliest available opportunity?

NSSMS Personnel

What are your general impressions of EPICS?

Has the work process had to be changed to accommodate the EPICS sailors? How do your EPICS sailors compare to "A" school graduates in terms of supervision and OJT? "C" school graduates?

What kind of maintenance are "A" school graduates assigned during their first year aboard?

What kind of maintenance are "C" school graduates assigned their first year aboard ship? How long before they perform unscheduled maintenance and troubleshooting?

Before attending ETT, could EPICS personnel perform the same main-tenance as "A" school graduates? After ETT?

How did it affect the work center's ability to handle the workload when EPICS sailors went to ETT? STT?

Is there a noticeable increase in the complexity of tasks which the ETT students are now able to perform?

Have you used any of the JPAs? Which tasks?

Have you used any of the modules? Which ones? Why?

NAME	SSN	FT ELIG	PRED 1-25	PRED 1-34	SHIP MODS	PRE COM	DAYS 1-11	E/S 1-11	HOURS 1-11	DAYS 1-14	E/S 1-14	HOURS 1-14	DAYS 1-19	E/S 1-1	OURS 19

A-66

BE&E STUDENT PROG___ FORM (GM, FT, ET)

DATE	TOTAL STUDENTS	PROS COMP TIME	CALENDER DAYS	CONTACT HOURS	EXTRA STUDY HOURS	1 # HRS	2 # HRS	3 # HRS	4 # HRS	5 # HRS	NO SCORE #1 HRS	(ELIGIBILITY)		
												Q	NQ	NO SCORE

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APPENDIX B

FEEDBACK SURVEY OPEN-ENDED RESPONSES

FEEDBACK SURVEY OPEN-ENDED RESPONSES

Open-ended responses about the Shipboard Instructional Program
by EPICS Shipboard Administrators (ESAs) 12 months after
EPICS personnel reported aboard

USS CONOLLY, DD-979

Although I agree with the intent of the program I have doubts as to its feasibility. I have yet to find a superior Fire Control Technician that acquired his knowledge through self-study. I have no doubt that self-study can work for some individuals but I feel the strong background needed for fire control will be more of a short term memory drill in the case of EPICS modules.

USS DEYO, DD-989

We have used the material as a study guide for the F-4 exam and found it very helpful.

USS NICHOLSON, DD-982

There is on DD-Class ship, an extreme shortage of non-rated personnel resulting in the need to send EPICS personnel mess cooking soon after reporting onboard, often before the recommended introductory period and recently the issue of sending these people again, within 5 months of completion of their last tour. This could conceivably result in a great loss of interest or an inability to maintain a scheduled completion of modules by the affected personnel.

USS CUSHING, DD-985

I am of the opinion that when the program continues with availability of JPAs, Mods and school WHEN NEEDED it will be a very effective program. Our major problems have been that our EPICS sailors are ahead of the production of Mods etc. and are subject to boredom and lack of motivation perhaps as a result of this.

USS HEWITT, DD-966

I sincerely believe that this training should be put out in a formal classroom environment. Especially the ETT portion as you can't realistically expect them to learn this here as we have no training aids for the many experiments in these modules and no performance tests to monitor their progress either.

USS HARRY W. HILL, DD-986

Due to our WESPAC schedule, we have not yet received ATDs 5.0 on up. These modules are necessary to prepare the EPICS sailors for their first school. Expediting the modules to us would be greatly appreciated.

<u>USS JOHN YOUNG, DD-973</u>

It is clear that this progrm requires a lot of self-motivation on the part of the EPICS sailors; the ones assigned to JOHN YOUNG have not displayed a strong interest in progressing through the program. None have kept up with the time table in the Admin Guide, some are way behind.

ETT-related, open-ended responses from Feedback Survey
by EPICS personnel six months after ETT

USS MOOSBRUGGER, DD-980

Boot camp atmosphere should be changed in ETT school.

Not enough chance to study.

USS STUMP, DD-978

Nothing should be changed in ETT school. I thought it was a good school (well laid out). The teacher was very helpful.

I do not think that the EPICS program should separate schools by a large amount of time. It is detrimental to the student. I think you should go to the ship for 6-8 months and then onto all of the schools. (All of them).

ETT school is useless. GMT's that we have already experienced in the fleet waste study time or liberty time which lowers morale.

USS SPRUANCE, DD-963

Would recommend that ETT school be longer for the courses to be done or shorter and drop some of the mods so that this does not have to be taken back to the ship due to the hardness to get the test for completion of the mods.

USS NICHOLSON, DD-982

ETT school needs to be a little longer.

USS COMTE de GRASSE, DD-974

Nothing needs to be changed in ETT school. The course was excellent. Maybe we could of done without the military B.S. that went with it!

USS DEYO, DD-989

I know the EPICS program is short on time but I got through ETT school so fast I forgot a lot of what I learned.

Set the ETT school away from NTC. Fleet sailors don't like all of the strict military regulations. But I guess ETT school is closing anyway.

USS O'BANNON, DD-987

I believe that the ETT course has a good format and should stay the way it was when I went through. As it is, ETT poses a challenge to most of those who take it and for the more advanced students it contains information which should be enjoyable to learn.

USS KINKAID, DD-965

I might add a week or two to ETT so that we could learn the diagrams better. The teachers were excellent! The test equipment wasn't the best but we got by.

I think that the change from shipboard life to the "recruit" training center was a bit drastic. It was a pleasure to get back to the ship.

USS ELLIOT, DD-967

I would add more time if it was necessary for students to complete ETT. It's hard to complete ETT on board ship!

USS HARRY W. HILL, DD-986

In ETT school, teachers should be more helpful to all students, not just their favorites.

Why is the requirement for STT school 18 months left in the service when you promised two schools from the beginning?

USS PAUL F. FOSTER, DD-964

As far as ETT school, I wouldn't change anything, just encourage the EPICS sailors to get the ETT modules done and study them before going.

APPENDIX C

SHIPBOARD INTERVIEW RESPONSES

FPICS Administrators

Shipboard Instructional Program

What are the advantages and disadvantages of EPICS for the Work Center?

Induces more training in work center, refreshes basics for experienced techs.

Are the Administrator duties manageable as a collateral duty?

Yes. (6)

What is the paperwork load like?

Very little. (5)

Program runs itself. (2)

Do you think a brief (1-2 days) administrator training course would have prepared you quite a bit better for you Administrator duties?

Yes. (4) However, CNTECHTRA would find out about it and throw a course number on it, then quota control becomes administrative mess.

No. (3) Field Representative indoctrination was adequate.

Do you think a semi-annual meeting of administrators would help to keep you prepared?

Yes. (6) Would highlight problems not unique to one platform, can discuss problems and ways of handling the program.

Do you have all the modules?

Yes. (14)

How do you store them?

In file drawer, organized by color (series). (6)

At first, in cardboard box, now on the shelf.

Is there time available during the average work day for EPICS sailors to study their modules?

Yes. (6)

Varies with the work load.

Do they usually use this time to study?

Had to make sure they were using free time during work hours to study.

Further into the modules they progressed, the more enthusiastic they were.

Most of the EPICS sailors needed additional encouragement from coworkers or supervisors(tight division helped this).

Crisis management frequently disrupts their ability to get study time.

School(and getting off the ship) is excellent incentive to study on the ship.

What is you normal end-of-module test procedure?

Always review missed items. (10)

No set standard of performance. (6)

70% pass level. (4)

How would you improve/modify the instructional modules?

Like them as they are. (4)

Too many mistakes in module tests, need better quality control.

Alternate tests don't appear to be any different from original.

Include a module on setting up 'O' scope and other test equipment.

Bindings are terrible, come off easily, are flimsy.

Have EPICS sailors been jumping the module order?

Within a series(e.g., ATD1-6) they have been, but not across different module series.

Can't skip around in the ETT prepatory module series.

ETT School

Can the ETT-Prep modules be completed on the ship without special equipment?

Would like breadboards to apply(simulate) knowledge in the modules. (6)

Helps prepare them for ETT, but too abstract without hands-on.

What were the criteria used by Division for assessing recommendation to attend ETT?

Person has to demonstrate desire to progress. Would not send disciplinary problem.

Must be a good worker, willing to pull his share.

If they continue to advance through modules and military requirements, this is an indication of motivated sailors.

Did it affect they work center work load when EPICS sailors attended ETT?

Not in PMS, but in space maintenance. (5)

Recommend sailors be assigned to ship in 'twos', because they can give each other support yet it doesn't cripple the work center when they go to school.

Shipboard Instructional Program

What are your general impressions of EPICS?

> Like the idea of hands-on work combined with study.

> Tough being junior in the work center and still expected to do modules.

> Thought Ship and Job Indoctrination module series were too basic.

What are the advantages and disadvantages of EPICS for the sailor?

> Going to school is incentive to study, breaks monotony to get a break from the ship.

Is there time during the average work day for you to study the instructional modules? Do you usually use this time to study?

> Yes. (6)

> Not very often. (6)

> Difficult to find time to study. Sometimes aren't motivated, but is rewarding to finish a module that was hard.

What is normal end-of-module testing procedure?

> No set 'pass' level, go over any questions missed.

How would you rank the information presented during the SI, JI, and AID module sets in terms of utility?

> SI & JI are good if you didn't receive the normal indoctrination. AID series are good because you feel you're getting close to the equipment.

How would you improve/modify the modules?

> Many mistakes with the test questions. Should space test answers farther away from questions, can often see them at the same time. If a module seems too simple, sailors get insulted and tend to generalize these negative attitudes to all modules.

Was it more difficult for you to study your modules during mess cooking?

> Yes, was too tired. (3) During the same period of time that they can assign you to mess cooking, you're also expected to become 3M & DC qualified. Need dedicated time, then should have no problem.

ETT School

Can the ETT prepatory modules be completed on the ship? Any special equipment needed?

Yes, want to do the job programs but need test equipment for that. (3)

Is there a noticeable difference in the complexity of task which the ETT attendees can now perform?

Yes. (3)   Can do BIT off-lines now, other more complex tasks. Were frustrated not knowing electronics before attending school.

EPICS Shipboard Administrators

ETT School

What were the criteria used by the Division for assessing recommendation to attend ETT?

>   Person has to demonstrate a desire to progress, would not send a disciplinary problem. Advancement through the instructional modules and completing military requirements is an indication of motivated sailors. (3)

Did it affect the work center work load when EPICS sailors attended ETT?

>   Not in PMS, but in space maintenance. (5)

>   Recommend sailors be assigned to the ship in 'twos' because they can give each other support yet it doesn't cripple the work center when they go to school.

Was there a noticeable increase in the complexity of tasks which the ETT attendees could perform when they returned to the ship?

>   Somewhat, can use test equipment better. (3)

>   Yes, had more confidence, got into the gear more. (3)

>   Haven't had an opportunity to use their knowledge because we are in the yards. (3)

If ETT modules were brought back to the ship, are the EPICS sailors finding them difficult to complete?

>   Yes, more than the other modules. Senior personnel need to encourage them. (8)

EPICS Personnel

ETT School

Is there a noticeable difference in the complexity of tasks you can perform after attending ETT?

>   Yes, can do BIT off-lines now, other more complex tasks. (3)

What kind of maintenance have you performed since attending ETT?

Done more testing, adjustments, and minor troubleshooting. Have better understanding of what's going on. (6)

Can understand publications more. (5)

Never had chance, were in the yards. (4)

Didn't provide much directly applicable knowledge, but increased our supervisor's confidence in us.

Was electronics-related OJT easier to understand after ETT?

Yes, much easier. (10)

If ETT modules were brought back to the ship were they difficult to complete?

Yes, very difficult. 30-series should be done at school. (9)

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