REPORT ON THE OJT STUDY TASK

ON-THE-JOB TRAINING IN THE DEPARTMENT OF DEFENSE

PREPARED UNDER THE AUSPICES OF THE
DEFENSE EDUCATION AND TRAINING EXECUTIVE COMMITTEE (DETEC)

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EXECUTIVE SUMMARY
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This study originated as one part of an on-going effort by OASD(MRA&L) to examine the relationships between hardware and manpower requirements. The study is pointed at improving training, especially on-the-job training (OJT), to help to raise the standard of equipment maintenance in DoD. The basic study method was to use the mechanism of DETEC (Defense Education and Training Executive Committee) to set up a series of discussion meetings between Service and OASD(MRA&L) training staff members. Each Service then prepared a report (copies attached) identifying problems in OJT and evaluating alternative solutions. These reports are both thoughtful and useful. They were synthesized and, to some extent, augmented by the attached cover report prepared by the Training and Education Directorate, OASD(MRA&L). For maximum benefit, the cover report and Service reports should be considered as integral parts of a single report.

"OJT" has a variety of meanings. While the main focus of this study concentrates on planned and managed OJT aimed at complementing and supplementing formal school training, any measure that contributes to teaching maintainers in operational units to maintain better is accepted as a form of OJT for purposes of the study.

There is a widespread belief that there is a continuing trend toward moving training tasks from the formal schools to OJT in units. This study finds no compelling evidence of such a shift except for a migration to OJT in the Air Force. However, we are not sure that the current formal school-OJT balance is the optimum balance. This will have to be determined through on-going Instructional Systems Development (ISD) analyses of training in specific skills. In any case, better OJT is justified on its own merits as a partial solution to maintenance problems regardless of the correctness of the current formal school-OJT balance.

Service Views of OJT Problems and Solutions

OJT problems identified by the Services in their reports can be divided into two general classes: (1) problems that are caused by non-training factors and that can be mitigated, but not fully cured, by improved training; and (2) problems with current OJT systems that are susceptible to solution within the constraints imposed by the non-training factors.

Within the first class of problems, the one regarded as the most serious by all four Services is the shortage of NCO's in units and lack of instructional expertise among available NCO's. While the NCO shortage currently appears to be less severe in the Air Force than in the other Services, the retention rate trend for Air Force NCO's has it headed toward the NCO-poor posture of the

other Services. Since NCO supervisors are the key OJT instructors, there is a direct relationship between NCO fill and OJT quality: when NCO's are short, OJT quality goes down. The NCO shortage also damages instructor expertise because vacant NCO positions are filled by junior personnel who lack both thorough knowledge of the subject matter and training and experience as instructors. This situation can be improved by providing more formal schooling for junior, career-committed personnel. For various reasons, mainly budgetary, this career training has never been adequately funded. The Army and Air Force both propose initiatives to correct this weakness by funding more NCO training in the outyears.

Good OJT programs require a stable personnel environment with both trainees and supervisors interacting continuously and over an extended period. Personnel turbulence and the diversion of personnel to community support tasks obviously increase the difficulty of conducting coherent OJT. Solutions to these problems lie outside the realm of trainers. Operational commitments are necessarily given precedence over structured OJT when the two conflict as, for example, when maintenance units are working at capacity in support of continuously operational air defense units. Work being done by the Air Force to determine the relative capacity of units to assume OJT tasks is a sound first step in an area that needs fuller investigation.

The second class of OJT problems consists of those that can be alleviated by improving OJT despite the relatively intractable manpower constraints that currently exist. A problem cited by the Air Force is the transfer over the past several years of a possibly excessive number of tasks from the schoolhouse to OJT. The Air Force is considering proposing a moderate (14 percent) increase in average course lengths for initial skill training, with the bulk of the additional time being concentrated on problem skills. The resulting average course length would still be 9 percent below the level that prevailed in FY 1975. By contrast, average course lengths in the other Services have not changed appreciably during the same period. No decision need be made on the Air Force concept unless and until the Air Force decides to propose the increase in POM 83.

Other identified problems are related to weaknesses in the structure, support and method of delivery of OJT. For the long term, the Air Force proposes a major research project to develop a prototype OJT model, an effort that should prove beneficial to the other Services as well. Both the Marine Corps and the Air Force note flaws in current methods of identifying for the NCO supervisor the tasks he must teach through OJT. Both Services propose more resources to strengthen ISD procedures and to research better methods of identifying OJT tasks that pertain to particular jobs. Another pervasive OJT weakness is a less than adequate supply of instructional guides, materials and devices for use in the OJT setting. The Army, Navy and Marine Corps propose additional investments beginning in FY 1983 to alleviate

this shortage. The Navy's main thrust is to procure more pierside and other land-based simulators and trainers to allow realistic training on ship systems while in port.

Other OJT Issues

During the course of the study several other issues that bear heavily on OJT arose. These issues should receive more study by both the Services and OSD as the effort to improve OJT continues.

One issue is the role of equipment operators in a rounded program of maintenance improvements. While this and other studies have concentrated on performance of maintenance personnel, it must be kept in mind that equipment operators have a great capacity to reduce the incidence of equipment failures through preventive maintenance. They also have an equally great capacity to cause failures by abusing the equipment, failing to do prescribed maintenance or attempting unauthorized repairs.

OJT has a cost in terms of the limited productivity of the trainee and the diversion of NCO's from supervisory duties; however, there are no current means to isolate these costs. Consequently, although costs of schoolhouse training are readily calculable, it is not presently possible to compare these costs with OJT costs for use as a factor in determining the best allocation of learning tasks between formal schools and OJT. The Services and OSD should collaborate on research for an OJT costing methodology.

Two other issues are related to the effect of existing manpower allocation policies on OJT programs. First, by comparison with the civilian sector, DoD units, including maintenance units, tend to have too many apprentices and too few journeymen. This makes it hard to do either good maintenance or good OJT, and harder yet to do both well at the same time. While there are costs in retaining a larger force of journeymen, such costs would be substantially offset in terms of better maintenance and better OJT as well as reduced school training costs for new entrants. OASD(MRA&L) and the Services should analyze the costs and benefits of a more rational distribution of grades and experience in maintenance units.

Another manpower allocation issue is the lack of dedicated personnel to support OJT in units in the Army, Navy and Marine Corps. The Air Force has dedicated OJT monitors at unit or base level to help commanders and supervisors manage and conduct OJT. Some additions of trained personnel to support OJT in the Army, Navy and Marine Corps could pay real dividends in better OJT.

Finally it must be remembered that current training practices are part, but not all, of the cause of the maintenance problem and that better training can be part, but not all, of the solution. A cost-effective solution must be a balanced blend of improvements in the many factors that contribute to good

maintenance -- e.g., sound maintenance management, effective repair parts supply, proper distribution of maintenance personnel, etc., as well as adequate training.

Conclusions

Some problems in maintenance training can be solved by better training practices. Others, especially the NCO shortage, diversions to community support tasks and turbulence, may not be solvable by better training -- and these problems are the greatest obstacles to good OJT.

Of existing OJT systems, the Air Force's seems to be the most productive, the best organized and the best supported. However, the Air Force is currently in better shape than the other Services with regard to manpower problems. The Army OJT program, on paper, is almost as good but suffers in practice because of the NCO shortage, turbulence, and some lack, which the Army is moving to correct, of incentives to make the program work as well as possible. The Navy program is uneven -- some parts very good, others not so well developed; it needs more centralized support to complete and round out the program. The Marine Corps program is less than fully developed; however, the Marines are progressing in adopting some of the methods used by the Army to structure, document and support the OJT effort.

Of the solutions put forth by the Services, almost all merit further development by the Services and support, at least in principle, by OSD. Each Service, to a greater or lesser extent, has something to learn from each of the others. To facilitate this, the momentum of this study effort should be continued.

The Training and Education Directorate's attitude toward the Air Force proposal for more formal initial skill training is presently noncommittal. The Air Force is doing the homework necessary to present the needed justification. In doing this, the Air Force should separately identify proposals for increased maintenance training in problem skills so they can be given special consideration as appropriate. The attitude toward similar proposals from the other Services, should they choose to make them, would be the same.

The decision point for this and most other Service proposals that cost money will be POM 83.

The funds associated with all solutions put forward by the Services are divided about equally between those that are already in the FYDP and those that require "new money". As shown in the following table, almost all of these funds are associated with eight major projects. Some of the costs shown are preliminary estimates.

Service	Solution	($ in Millions) FY 83	FY 84	FY 85	FY 86	FY 87
Funds Already in Approved Program						
Army	NCO TDY to School	15.0	15.0	15.0	15.0	15.0
Army	NCO Education System Improvements	17.2	17.2	18.0	18.6	18.6
Navy	Planned Maintenance System	10.0	10.0	10.0	10.0	10.0
Air Force	NCO TDY to School	2.9	2.9	2.9	2.9	2.9
-	Other Solutions	13.9	5.1	5.6	6.2	4.4
	Subtotal	59.0	50.2	51.5	52.7	50.9
Funds Not in Approved Program						
Army	Training Extension Materials	20.0	20.0	10.1	10.1	10.1
Navy	Hot Plant Simulators	-	16.8	12.1	0.2	0.2
Navy	Pierside Van Trainers	2.5	5.0	5.0	-	-
Air Force	Increased Initial Skill Training	30.1	28.8	30.1	28.9	28.9
-	Other Solutions	4.3	6.2	6.6	6.8	7.1
	Subtotal	56.9	76.8	63.9	46.0	46.3
Grand Total		115.9	127.0	115.4	98.7	97.2

The Air Force initial skill training solution accounts for 93 percent (about 2900 spaces) of the "new" military manpower. All of the manpower already programmed is associated with the Army's NCO Education System Improvements (512 military, 10 civilian) and Navy "hot plant" simulators (174 military, 1 civilian).

All of the resource figures appear to be reasonable statements of the cost of the associated solutions.

Recommendations

a. That the serious degradation to maintenance and maintenance training caused by the NCO shortage, diversions to support tasks and turbulence be cited as primary justification for initiatives to ameliorate these problems.

b. That the ASD(MRA&L):

(1) Support:

- Specific proposals by the Services for more formal schooling for junior, career-committed NCO's in maintenance skills.

- Some additions of trained manpower to Army, Navy and Marine Corps field unit staffs to support maintenance OJT (if requested by those Services).

(2) Approve in principle initiatives to improve maintenance training proposed by the Services (except, at this time, more initial skill training), with decisions to be deferred to the POM 83 review.

(3) Reserve judgment, without prejudice, on increased school training in initial skills until the POM 83 review.

c. That the Services:

(1) Continue to identify further initiatives for improving maintenance training, making full use of the ideas and solutions identified by the other Services, for consideration in POM 83. Specifically, the Services that have not already done so should consider pursuing the initiatives listed in paragraph b.(1) above.

(2) Exmphasize ISD analyses in problem maintenance skills to determine if, and where, more school training is justified.

(3) Continue close liaison with each other and the Training and Education Directorate on this subject.

d. That the Services, the Training and Education

Directorate and other interested parties continue to work together cooperatively for a comprehensive solution to the overall maintenance problem.

REPORT ON THE OJT STUDY TASK

A. INTRODUCTION

1. Context of the Study. This study has two roots. First, a conviction has been growing for some time that there are serious problems, which are likely to grow more severe if not countered, in properly maintaining military equipment and weapon systems. This concern led the Principal Deputy Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) to direct a four-pronged study effort in cooperation with the Military Services. One study effort was to address problems and solutions in maintenance training, with emphasis on on-the-job training (OJT) (see tasking memorandums at Tab A). The second root of the study is in findings of the Combat Effective Training Management (CETRM) Study of 1979 that (1) there is a trend toward excessive migration of training from formal schools to OJT in operational units, and (2) many OJT programs are not well managed or effective.

This report responds to these concerns in the near term and lays the groundwork for continued longer-term studies and analyses. One such study recently launched by the Training and Education Directorate, OASD(MRA&L), is based on studying OJT techniques in civilian industry. The information gained will be used, as appropriate, in improving OJT systems within DoD. The Services, meantime, are responding to the CETRM findings by seeking methods to improve OJT and by conducting the necessary analyses, using Instructional Systems Development (ISD) procedures, to determine what adjustments of training tasks between schools and OJT are justified.

2. Study Method. Basically, this study relies on an effort by each of the Services to examine its OJT system critically, identify problems and alternative solutions, and recommend remedies and, as necessary, resource adjustments. Coordination of the effort has been made through the mechanism of the recently established Defense Education and Training Executive Committee (DETEC), composed of the senior general/flag officer responsible for training on each Service staff and the Director of Training and Education, OASD(MRA&L). The method of work was a series of discussion meetings between the Director of Training and Education and the senior (0-6 level) assistants to the Service DETEC principals, supplemented by a series of tasking memorandums (Tab B). Work progressed in phases -- nature of existing OJT systems, alternative solutions, evaluations of costs and benefits, recommendations -- with continuous interchange of information and ideas.

Considering the limited amount of time available (from mid-July to submission of final Service reports in

November) the Service reports are thorough, thoughtful and useful. The Service reports are appended and should be considered an integral part of the total report. This covering report is a synthesis and analysis of the Service reports, with some independent evaluations and perspectives, and does not seek to replicate the Service reports. For maximum benefit, the total report should be examined as a whole.

While the main focus of the study is on training in maintenance skills, much of the material is broadly applicable to training in most other skills. Training practices and patterns within a given Service are generally common across most specialties, and improvements appropriate to maintenance training are usually equally applicable to training in other skills.

B. OJT IN THE TOTAL TRAINING SYSTEM

1. The Total Training System. Each Service has a training system consisting of formal school training, training of individuals within units, and team training of units. The great majority of new enlistees (but not all) receive formal school training in a particular required skill after graduation from Recruit Training. This training, and the succeeding OJT in units that supplements and complements it, is designed through Instructional Systems Development (ISD) procedures. Among other objectives, ISD entails selection of tasks required for each skill and identifies those that are best taught in school and those that can be deferred to be learned through OJT. Generally, the deferred tasks are ones infrequently performed or ones related to particular equipment systems. The Air Force estimates that the process generally produces results for courses for first-enlistment airmen in this range:

-Tasks performed by over 50 percent of first-termers in the skill: taught in formal schools.

-Tasks performed by 30 to 50 percent: sufficient school training in background and fundamentals to allow qualification with minimum OJT.

-Tasks performed by fewer than 30 percent: defer to OJT.

This break is probably not untypical across the board.

OJT is also used to reinforce school-learned skills and, for more senior personnel, to develop and broaden technical and supervisory expertise in a career field. Finally, as units perform unit training exercises and daily operations, OJT in the form of experience on the job further develops skills and knowledge in the context of contributing fully to unit success.

2. What is OJT? Early in this study effort it became clear that the term OJT has a number of different meanings among the Services and, to some extent, within each Service. Understanding of the meaning of OJT covers some or all of the following learning situations, although some Services do not consider all of these situations to be true OJT:

a. Learning by doing. This is simply an extension of ancient apprenticeship practices. It may or may not include a training plan and progress standards, but its essence is learning a skill by starting with simple tasks as a helper and by doing progressively more complex tasks under supervision. By extension, this type of OJT includes skill development through playing an assigned part in any unit training or operations. By a further extension, it could be logically said that a unit itself is in a continuous OJT status as it perfects its teamwork skills through daily operations and training exercises; however, common usage of the term OJT restricts its meaning to describing the training of individuals.

b. Planned and managed OJT. This type of OJT uses task lists and standards, instructional media and a variety of teaching techniques to instruct the trainee, usually through his immediate supervisor, while the trainee is performing in an assigned job and specialty at his duty location. Methods of instruction under this type of OJT are generally fairly standard within a given Service, but the target trainee population and purpose of training covers the following spread of situations:

(1) Teaching a skill through OJT to new enlistees with no formal skill training. In FY 1981, the following percentages of Recruit Training graduates will be assigned direct to units: Army, 2 percent; Marine Corps, 20 percent; Air Force, 5 percent (however, these personnel are all destined for skills other than maintenance). All Navy personnel get at least some formal skill training. However,30 percent of them attend only 4-week Apprenticeship Training courses and are something of a distinct group, in terms of skills to be learned through OJT, since they fall between those peers who get no formal skill training and those who get more extended formal training.

(2) Supplementing and complementing training received in formal schools through OJT. This involves teaching graduates of formal schools those tasks that were not taught in school and reinforcing those that were taught in school.

(3) Using OJT to provide skill upgrade and broadening (to include training on new equipment) and to prepare the trainee for supervisory duties.

(4) Using OJT to provide conversion training from one occupational specialty to another as, for example, when a senior cook is converted from an overage specialty in the food service career field to a shortage specialty as an artillery section chief. A similar situation that should not arise, but sometimes does, occurs when the personnel system fails to deliver a required specialist or when workload in a particular workcenter outstrips the manpower allowance in the table of organization and someone must be trained sufficiently to cover the shortage.

c. Training through schools in the field. This type of training may be further divided as follows:

(1) Training by permanent, centrally authorized schools. This includes such schools as the Seventh Army Training Center in Germany, the Navy's Fleet Training Centers at major home ports, and the Air Force's Field Training Detachments, located at operational bases but assigned to and controlled by Air Training Command. The Army's Training Center is subordinate to the field command in Europe, and the Fleet Training Centers are under the Fleet Commanders. Training facilities of this type are at the margin of OJT; they are differentiated from formal school training only by their more direct responsiveness to the immediate needs of field/fleet units and their proximity to those units.

(2) Other field command-sponsored schools. This covers a variety of training arrangements, some permanent, some ad hoc, that typically are funded and operated by field commands with personnel and other resources taken out of hide. Included are Army "shadow schools", usually at base level, and command-sponsored Mobile Training Teams.

d. Contractor training. Contract support, frequently by the firm that produced the equipment, plays a variety of training functions. At the unit level the Navy, for example, has used contract personnel for direct instruction in the OJT mode aboard ship. Contractors may also provide instruction to Service maintenance personnel at any maintenance level, including depot. Factory training is generally considered as formal school training, since it is usually arranged through the training commands, but it may be an offshoot of OJT if it directly supports field units.

Most of these variations of OJT appear at one place or another in the appended Service reports. While the main thrust of this study is aimed at the planned and managed OJT defined in paragraph B.2.b. above, there seems to be no good reason to exclude from the discussion any training mode that improves the performance of maintenance personnel in units, whether one wants to call it OJT or something else. In this

sense, the OJT umbrella is big enough to cover all means of teaching maintainers assigned to operational units to maintain better.

3. Service Variants of OJT. No attempt will be made here to repeat Service descriptions of their OJT programs given in their reports. However, a brief description of how they work in theory, although not always in practice, will help at this point.

a. Army. The Army officially defines OJT as "a training process whereby students or trainees acquire knowledge and skills through actual performance of duties, under competent supervision, in accordance with an approved, planned program." OJT directed toward bringing new graduates of formal schools up to productive status (Skill Level 1) is referred to as "individual training in units." This involves teaching required tasks not taught in schools and reinforcing capabilities in those that were. The key instructor, as in all of the Services, is the immediate NCO supervisor. A comprehensive set of documents tells the soldier, his commander and his supervisor what must be learned and how to teach it, and provides means for recording progress. OJT programs for more senior soldiers follow a similar pattern. Skill Qualification Tests (at least in those skills for which SQT's have already been prepared and validated) provide a further means to verify a soldier's progress and to plan remedial training. Essentially, Army OJT is centrally planned, devised and supported by the Training and Doctrine Command (TRADOC), and decentrally executed and checked on by the field chain of command.

b. Navy. The Navy defines OJT as "training in the actual job situation during daily operations" or as "any preplanned use of work resources in the work environment primarily for the purpose of training someone to produce work." OJT applies either to skill upgrade or supplementary training following initial skill training. In the latter case, a prescribed period of OJT can lead, in some specialties, to the award of a Naval Enlisted Classification (NEC) designation, an award that is made in other specialties only after formal schooling.

The term "OJT" is not used much in the Navy, and a term more comfortable to the Navy (but well within the scope of OJT as used in this report) is "on-board training," which includes OJT as defined above. On-board training encompasses the whole of the training a command -- ship, air squadron, etc.-- provides: training of individuals in maintenance and operator skills and watchstanding qualification, and watch team training. Much of on-board training actually uses a variety of short courses ashore at Fleet Training Centers, a training method uniquely suitable to the Navy because the

ship conveniently conveys the crew to the vicinity of the schoolhouse in the course of routine operations. However, the only major Fleet Training Centers are at Norfolk and San Diego; ships home-ported elsewhere have considerably less opportunity for this type of training.

It is difficult to generalize about OJT in the Navy because of the considerable differences in training procedures among the surface, subsurface and air communities. In addition, Navy unit commanders, while they use Navy-wide, or community wide, training guides and qualification standards, probably have greater latitude and less central direction in establishing individual training programs than their counterparts in the Army and Air Force.

c. Marine Corps. The Marine Corps does not customarily use the term OJT to describe either supplemental training following graduation from formal schools or upgrade training. It prefers to view this as "proficiency training," but the distinction is not important for the purposes of this report. OJT to the Marine Corps refers mainly to the training given by units to Marines who have had no formal school training; it thus excludes training of maintenance technicians, all of whom are school trained.

Like the Navy's, the Marine Corps OJT programs tend toward non-standardization and considerable latitude on the part of the local commander. Overall, the Marine Corps seems to provide less OJT support to the field than the other Services.

d. Air Force. The Air Force has made the greatest effort of any of the Services to research, plan and systematize OJT, and thus has the most carefully structured system. The Air Force defines OJT simply as the training received by an airman while he is performing in an Air Force Specialty at his duty location. This is broad enough to encompass the entire range of OJT definitions in paragraph B.2. above.

The Air Force uses a dual-channel OJT system. The Career Knowledge channel consists of prescribed self-study programs, well supported with study materials, and end-of-course examinations. The other channel, Job Proficiency Training, "qualifies airmen to be independently productive in a job position in their specialties." The program uses centrally developed Specialty Training Standards and Job Proficiency Guides that describe the knowledge and tasks to be learned. When an airman and his supervisor agree that proficiency has been attained on required tasks, the supervisor certifies the performance. The Air Force also makes extensive use of Field Training Detachments belonging to Air Training Command but located at operational bases. These typically teach tasks that are

specific to the equipment in the trainee's unit.

The Air Force, alone among the Services, uses trained OJT monitors at unit or base level to assist supervisors and manage the OJT program. This arrangement is aided by the fact that the Air Force has a separate training and education career field for officer and enlisted personnel.

4. How Much OJT is Going On? There is a prevalent belief that there is a continuing trend toward transferring training tasks from the schoolhouse to OJT, with a resulting overburdening of operational units. This is stated as a fact in the CETRM Study Report and is repeatedly cited as a major cause of maintenance problems in the "Interim Report of the Ad Hoc Group on Near Term Maintenance Improvement Program" of November 17, 1980. While the OJT Study Task effort has not specifically addressed this issue, available data cast doubt on this contention, with the exception of a shift toward OJT in Air Force.

There is no reliable way to measure the trend in the amount of OJT, since there are neither standardized definitions or centralized data systems on OJT. Some insights into the trend in use of OJT can be gained, however, by looking at trends in amounts of formal training on the assumption that the OJT workload goes up when the amount of formal training goes down. The following table shows trends in initial entry training courses. The data include all courses, not just maintenance courses, since separate data on maintenance courses are not readily available.

The results are mixed. The Army figures are skewed by the absence of OSUT course lengths in FY 1975, when OSUT was only used on a small scale, but OSUT, in any case, includes little if any training of maintenance technicians. With the planned addition of one week to Recruit Training and OSUT courses in FY 1982, the average Army entrant will get about the same amount of training as he would have gotten in FY 1975. Navy and Marine Corps figures, like the Army's, show no appreciable change likely to bear on maintenance training. The Air Force figures do change appreciably and deserve further discussion.

One problem with this sort of comparison is that repeated efforts over the years have failed to elicit data for years prior to 1975 that are reliable or comparable. As an exception, Air Force has good records on average course length trends, and the appended Air Force report shows an Initial Skill Training length of about 17 weeks in 1970 (this figure and the ones in the table are slightly larger than the figures used in the Air Force report because they are "time in training status," which includes a few days of administrative time, rather than just syllabus time). But a number of factors make the apparent decrease somewhat smaller than

shown:

- Air Force use of ISD, particularly during the early 1970's, winnowed out much course material considered to be of marginal value no matter whether it was taught in school or through OJT.

- Air Force, and the other Services, moved from a philosophy of training each recruit as if he were going to be a careerist and started including in Initial Skill Training only tasks needed in his first enlistment. This was done on the premise that most first-termers don't reenlist and that it is therefore less expensive to restrict advanced training to committed careerists. The appended Navy report notes an unintended benefit of this approach in that first-termers who are less thoroughly trained have less appeal to private industry and are more likely to reenlist. However, the Air Force reports a problem, discussed later, in funding the needed formal training for careerists.

- Air Force standardized its training day at 8 hours in 1979, adding a minor increment of training time to the training week.

- In all Services, changes in instructional methods (especially from lock-step instruction to individual pacing), task redistribution (such as the Army's recent change from all-purpose tracked vehicle mechanics to ones oriented to fewer vehicles), revised task analyses, introduction of new equipment (much of which undoubtedly calls for more training, but some of which probably calls for less) and other factors have introduced a vast number of ups and downs in the lengths of various courses.

All of this seems to show (1) no evidence of a shift of training tasks out of the schoolhouse to OJT in the Army, Navy, or Marine Corps since 1975, and (2) evidence of a real shift in the Air Force that represents the equivalent of perhaps two-thirds of the amount that a barebones track of course lengths would indicate. It is granted that these are average lengths of all courses, not just maintenance courses. However, there is no available evidence that the average length of Army, Navy or Marine maintenance courses has been reduced over the past six years (or that the steady overall average course length is an artifact of longer non-maintenance courses counterbalanced by shorter maintenance courses).

There is no claim made here that the current balance between formal training and OJT in maintenance skills is the optimum balance. It may be, too, that a careful historical study of a broad selection of typical maintenance courses, taking account of all situational changes, could demonstrate that a shift of teaching tasks from school to field in the Army,

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ERRATA SHEET

(Insert following 2d unnumbered paragraph of paragraph B.4. (page 7) of Cover Report)

Trend in Initial Entry Course Lengths (Weeks)

	Recruit Training		Initial Skill Training		Total	
	FY 75	FY 81	FY 75	FY 81	FY 75	FY 81
Army	7.0	7.0	9.0	9.6	16.0	16.6
Navy	9.0	7.7	5.7	6.1	14.7	13.8
Marine Corps	11.0	10.3	8.6	9.0	19.6	19.3
Air Force	6.0	6.0	14.3	11.6	20.3	17.6

Trend in Direct Assignments to Units (Percent)*

	FY 75	FY 81	Change
Army	5	2	-3
Navy	0	0	-
Marine Corps	36	20	-16
Air Force	5	5	-

*Percent of graduates of Recruit Training assigned direct to operational units without Initial Skill Training.

Navy or Marine Corps has taken place or, even if no shift has taken place, that the current balance lays too heavy a burden on operational units in one or more Services. Such an analysis has not been done, and probably should be. Present evidence to that effect is almost entirely anecdotal and not nearly persuasive enough to cause a prudent manager to invest in large increases in formal school training, especially when improved OJT or some combination of training and non-training actions may be equally effective and cost less.

If there is one point on which the whole DoD training community is agreed, it is that informed decisions on the OJT-formal school mix must be based on a skill-by-skill review using ISD procedures. The CETRM Study Report recommended such a wholesale review, and the Services are working on it. It is probably feasible to speed up the effort with regard to maintenance training if a few specific, significant problem skills or pieces of equipment are identified and targeted.

Taking a broader view, the issue of trends in the OJT-formal school balance should not overshadow the main purpose of this study, which is to see how OJT can be improved. Regardless of course lengths, good OJT programs can help to improve maintenance. Good OJT thus stands on its own merits as a worthy objective.

5. What Are the Advantages of OJT? While everyone agrees that overdependence on OJT at the expense of formal school training is bad policy, OJT has certain inherent advantages that should not be ignored:

a. Prudent use of OJT makes more manpower available to the operating forces and avoids applying additional resources to the formal school system. About one out of every six military personnel in DoD is a student, instructor or supporter in the formal school system. Six percent of DoD civilians support this training system. Without OJT, these numbers would have to be larger if the same standards of training in the operating forces are to be maintained. It is true that OJT is not free, an issue that is discussed below. But an OJT trainee in a unit, at least after some period of training, is more productive than an empty space.

b. In some cases, training as a member of an operational unit may be more productive than too much training in a school environment. The longer a school course lasts the more likely it is that boredom will rise, the capacity for absorbing knowledge will approach saturation, and a sense of purposelessness will set in. Cutting off schooling at a judicious point and moving the trainee to an operational unit can mitigate the effect of these

factors. As a member of a unit the trainee works under a single supervisor on the relevant unit equipment. He belongs to a unit with a mission and, as he perceives his place in accomplishing that mission, he is motivated to learn so he can do his share. Similarly, the supervisor is motivated to teach him, because the sooner the trainee becomes productive the sooner he can help in the supervisor's maintenance task.

c. It is probable that lessons learned through OJT are better retained and decay less because they can be put to immediate use in a real-world situation.

d. OJT can be quickly responsive to a variety of changes in unit workloads and operational requirements.

There are disadvantages to OJT, as is amply discussed below in paragraphs C. and D. However, these disadvantages are almost all products of the manpower situation in which the Services find themselves today, or else they result from flaws in current OJT programs that may be remediable. None of the disadvantages seem to be inherent in OJT as a teaching method, at least when it is properly applied.

C. SERVICE VIEWS OF OJT PROBLEMS AND SOLUTIONS

Many of the problems discussed below were identified by all Services, some by three, two or only one of the Services. The Services that identified each problem are keyed (A,N,MC, AF) after the title of the problem, and fuller information on the problems and solutions, and on some problems not discussed in this cover report, can be found in the Service reports. A number of the problems and solutions seem to have application to Services that did not cite them. An additional set of issues that seem germane but were not specifically cited by the Services for one reason or another are discussed in paragraph D.

1. Deficiencies in OJT Instructors.

a. Shortages in authorized numbers of NCO's in units (A,N,MC,AF). This shortfall is seen by all four Services as the most serious obstacle to effective OJT. The Air Force appears to be in somewhat better shape than the other Services in this respect, but it is on a retention glidepath that will bring it to the unfavorable position of the other Services unless corrected.

The success of all OJT programs rests on having an adequate number of NCO supervisors. Self-study programs, the main recourse if no supervisor is available, are unlikely to be very productive with the average servicemember who needs a supervisor to keep him moving and to help him over difficulties. The problem is particularly discouraging

because it feeds on itself: NCO's are short, so they must concentrate on shop supervision, or even perform maintenance themselves, and have less time to develop their subordinates through OJT; the subordinates do not learn quickly enough to allow them to relieve the NCO's of their workload; overworked NCO's are less likely to reenlist, which makes the problem worse for the NCO's that remain, so they become dissatisfied, etc., etc.

The Services have no specific solutions to offer to this non-training problem except a shared hope that improved benefits will improve NCO retention. A full solution is well down the road because of the time it takes to grow NCO's. However, solutions to other problems cited below provide some offsets to the NCO shortage.

b. Lack of OJT instructor expertise (A,N,MC,AF). This is closely related to, and in good part caused by, the NCO shortage. The shortage of NCO's causes supervisory positions to be filled by junior personnel who lack experience and may themselves be less then fully trained because of previous shortages of supervisors. These junior personnel, in the main, are not well qualified as OJT instructors. First, they lack the detailed technical knowledge that a more seasoned supervisor learns through experience. Second, they have little experience, and probably not much training, in methods of instruction.

Earlier in this report it was mentioned that many initial skill training courses had been narrowed down over the past ten years to focus on job skills needed in the first enlistment rather than on all the skills needed throughout an entire career. This was done on the premise that those who became committed careerists would be returned to school at appropriate career points for more advanced training. In many cases this premise has not been carried out in practice, mainly because NCO schooling has tended to become a casualty in the competition for resources. The Army and the Air Force, in particular, cite this problem and recommend specific solutions.

The Army has, for many years, analyzed and talked about its NCOES (NCO Education System), a planned pattern of job experience, OJT and periodic formal schooling to develop NCO's in each career field. However, the formal school portion of NCOES has been only about 50 percent implemented because of budgetary considerations. The Army's appended report recommends favorable consideration for programmed funds ($17-18 million per year, FY 1983-86) for selective development of NCOES.

The Army also asks support for resources, mostly already budgeted, in FY 1981 and FY 1982 to support sending NCO's to school while they are TDY enroute between duty stations, and

for sending personnel in operational units who are serving in positions one or two grades above their actual grades to school on TDY. The Air Force also proposes additions of about $3 million per year in FY 1983-1987 to allow increased TDY to school for NCO development. As the Air Force notes, this approach should pay quick dividends in a period of NCO shortages because it has the dual advantage of simultaneously reducing the current OJT burden in operational units and producing qualified future OJT instructors.

A longstanding problem in funding schooling for NCO's has been the vulnerability of the resources to budget cuts or reprogramming. Field/fleet commanders have tended to look on TDY funds, in particular, as a convenient kitty to draw on to fund other pressing needs. This may be understandable, but the long-term effects on NCO development are very serious. Given this vulnerability, (1) justification for added funds for NCO education must be exceptionally sound and thoroughly documented, and (2) consideration should be given to fencing TDY-to-school funds to prevent them from being robbed during the year of execution. An allied problem that must be considered is that commanders who are short on qualified supervisors frequently conclude that they cannot lose the services of NCO's long enough to release them for school. Service policies should provide incentives to counter this attitude.

2. Lack of Available Time.

a. Excessive non-mission commitments (A). The Army cites a "serious degradation" to OJT caused by the diversion of troops from their primary jobs to do community support tasks that should more properly be done by DoD civilians or through contract. The greater the diversion, especially of personnel in highly technical skills, the more difficult it is to conduct a coherent OJT program (or a good unit training program either). This may be a problem in the other Services as well, but they do not cite it in their appended reports; furthermore, over the years, the volume of complaints on this subject has been far higher from the Army than from all other Services combined. It may be that the Army needs special consideration here.

However, the Army does not propose any specific action in its report to alleviate the problem because the means of alleviating it go well beyond the scope of this study. This problem will have to be set aside for further analysis. In this regard, the Army has never done very well at justifying remedies to the diversion problem; its main justification has been couched in generalities, such as gross numbers of personnel diverted, and not in specific effects of the diversion. In the interim, it is possible that the Army could also do more in setting priorities among classes of

units for furnishing non-mission support. As a hypothetical example, where maintenance is a problem maintenance units might be levied for fewer, or no, personnel for community support if units with less pressing missions could furnish more. This diversion issue is discussed further in paragraph D. below.

A related problem, not mentioned in the appended Navy report but cited in the Interim Report of the Ad Hoc Group on Near Term Maintenance Improvement, is the Navy's practice of assigning most initial skill training graduates to messcook duties (KP) for extended periods early in their tours in their first units of assignment. This practice is bound to result in skill decay and a setback in the learning process that may end up requiring more intensive OJT. This practice may be the only feasible solution aboard ship but there are alternatives at shore stations. The Navy would be well advised to look into this problem.

b. Conflict with operational commitments (A,N,MC,AF). It is obviously more difficult to conduct good OJT (except that OJT which consists of learning by doing) when supervisors and trainees are faced with continuous operational requirements. The same problem exists when units with fluctuating operational requirements are operating at a high tempo--for example, when a Marine unit is gearing up for a deployment. On the other hand, as the Navy notes, a deployed ship can be an excellent setting for learning by doing.

The normal casualty in operational situations is planned, structured OJT that competes with operational imperatives. A recent study by the Logistics Management Institute of maintenance of Army air defense weapon systems in Europe showed that little or no OJT of this type was being conducted. The reason, but by no means the only reason, was that about one-third of the firing batteries were fully operational 24 hours a day as part of air defense system protecting Western Europe, and the maintainers were overwhelmed with urgent repair work to support the operational mission.

The problem of priorities and relative command emphasis also come into play here. The Navy cites this as a problem it intends to attack through developing more uniform standards and policies. The Army discusses developing incentives to encourage the trainee to learn and the supervisor to teach, and also increased emphasis on the Battalion Training Management System to improve and standardize training management in units. No OJT system will work unless it gets its due share of command attention. However, there is no purpose in simply adding OJT to the interminable list of "essentials" for which commanders are held responsible unless the time and tools for a good program are provided.

But if they are given the resources, it is reasonable to hold commanders' feet to the fire.

The Army, Marine Corps and Air Force do not offer much in the way of concrete solutions to the conflict with operational commitments--they tend to treat it as a defect inherent in over-reliance on OJT. This may be true, but some partial solutions are discussed in paragraph D. below. The Navy's conceptual approach to the problem is somewhat different--the Navy seems to want more operational time to complement the necessary but less than fully realistic training it can get in port. In fact, much of the Navy's in-port training--use of plug-in, van-mounted simulators to drill teams in air defense or antisubmarine problems, use of actual shore-mounted "hot plants" for training operators and maintainers, and "fast cruising" ("fast," in this case, meaning remaining tied fast to the pier while steaming the propulsion plant and operating all on-board systems)-- is mainly intended to simulate operational conditions. However, the Navy's cyclical deployment schedule is not typical of operational situations in the other Services.

c. Operational environment constraints (N). Despite its general approval of operating conditions for training, the Navy has unique problems in conducting a rounded OJT program. The effect of the good training gained at sea is dissipated by extended home-port stays, introducing peaks and valleys in the state of training. In addition, a ship is not a good setting for certain types of OJT, such as classroom instruction or the use of various other conventional teaching techniques, hardware and materials that are readily used on land. Another OJT problem that particularly affects the Navy is that a ship's complement in certain specialties may be so small that all available time at sea for both supervisors and trainees is taken up by watchstanding and little or none remains for dedicated training. The majority of Navy's recommended solutions for improving OJT involve improved shore-based training to supplement training that is difficult to do well at sea.

3. Personnel Turbulence (N,MC). While only the Navy and Marine Corps specifically cite this as an OJT problem, it is certainly also a problem in the Army and possibly somewhat of a problem in the Air Force. Not only does turbulence interrupt coherent OJT programs, it also may force units to spend so much time on repetitive team training that systematic OJT takes a back seat.

The main cause of turbulence is the individual replacement system. The Navy undergoes especially heavy turnover at the beginning and end of extended deployments and extremely heavy crew turnover during ship overhauls. The Marine Corps avoids some of the effects of turbulence by deploying whole

units. The Army is considering a plan for rotating company-sized replacement units from CONUS to Germany and Korea. Other contributors to turbulence are relatively short enlistment periods in some Services, high early losses of first termers and declining retention rates.

Turbulence is not a problem that trainers can rectify. However, any improvements in the quality of OJT programs will alleviate some of the impact of turbulence on the training of individuals by getting the most out of the OJT that can be provided.

4. Excessive Number of OJT Tasks (AF). The Air Force believes that it may have gone too far in transferring learning tasks from the schoolhouse to operational units. Consequently, it is considering requesting resources in POM 83 to increase its average weighted course length by 1.5 weeks, or about 14 percent. Actual increases in individual courses would vary according to need. The cost would be about $30 million per year, FY 1983-87; the associated military manpower is about 2900 spaces. The benefits, as seen by the Air Force, would be better OJT for the remaining tasks, a reduction in conflicts between OJT and mission requirements, and provision of formal training in some specialties now learned entirely through OJT.

There is reason to look favorably on this concept, at least in principle, because the Air Force has demonstrably reduced its formal training much more than the other Services. The generally good state of OJT management in the Air Force argues both for and against the concept: for, because there are grounds for confidence that the remaining OJT tasks and reinforcement training would continue to be well taught, and probably taught even better; against, because the Air Force is generally more capable of absorbing OJT tasks than the other Services. As the Air Force realizes, it has work still to do to demonstrate a need for the additional training, and it is working on a rounded proposal for possible inclusion in POM 83. It would be advisable for the Air Force to display and justify increases in maintenance training separately so that, if maintenance is considered the priority problem, the validity of increases for maintenance training can be judged separately.

The other Services do not mention the alternative of increasing formal training. This omission is almost certainly not due to lack of consideration of the alternative; it is probably due mainly to concern about the availability of the associated resources, particularly NCO instructors. The Army, Navy and Marine Corps are in something of a box on this issue. The shortage of NCO's makes it difficult to conduct sound OJT programs in units, but the demand for NCO's in units for operational purposes as well as for training is so great that it is seldom

feasible to assign more of them to formal schools. For this reason, it is probably more realistic for these three Services to concentrate on improving OJT in units, since units generally get a higher assignment priority for NCO's than formal schools do, than to try to solve their individual training problem by increasing the length of formal training. This issue is further discussed in paragraph D. below.

When considering alternatives involving increased formal school training, all Services should consider the relative priority of more training for NCO's vs. more skill training for new entrants. If a choice has to be made, training junior NCO's, especially first-termers committed to reenlist, would probably do more to improve skills overall, since the trained NCO's could then do a better job at teaching the new people through OJT.

5. Systemic Problems.

This paragraph includes discussion of miscellaneous problems and solutions cited by one Service or another that relate to faults, mostly correctible if resources are made available, in existing OJT systems.

a. Weaknesses in task identification (N,MC,AF). Both the Marine Corps and the Air Force note that resource shortages prevent the best use of ISD as a tool for identifying tasks to be taught in schools and in OJT. The Air Force proposes, for POM 83 consideration, yearly investments rising to $2.8 million, 49 military personnel and 13 civilians to augment training in ISD techniques. The Marine Corps proposes to improve the training of training managers and instructors in ISD techniques; this and related issues are the subject of an FY 1982 Marine Corps research project, so the ultimate costs are not yet known.

The Air Force notes that current ISD procedures do not tell much about the comparative costs or desirability of OJT vs. formal school training or about the relative ability of operational units to assume OJT burdens. Funding for research to develop a Training Decision System to provide better answers to these issues will be addressed in POM 83. The Navy is progressing very slowly in getting its ISD program into full operation. The Navy report recognizes the problem that this creates in proper task identification for OJT, but does not identify what resources are needed to correct the situation. It would be appropriate for the Navy to rethink its whole ISD posture.

b. Training research and development (AF). The Air Force has done considerably more research on issues relevant to OJT than any of the other Services. It also puts more emphasis on R&D in its appended report as a means

of further improving OJT. The Air Force report concludes that "funding the training development PE and support for R&D projects for OJT offer the best mid and long-term cures for OJT." In addition to the projects mentioned in the previous paragraph, the Air Force recommends support for an R&D project over a period of five years beginning in FY 1982 to develop a prototype system for the management and delivery of OJT in the late 1980's and 1990's. The other Services could benefit from past and future Air Force R&D findings.

c. Non-standard OJT and lack of quality control (N,MC). Without a considerable degree of centralized assistance and control OJT is likely to result in uneven products. As the Navy views itself, "OJT lacks centralized management at any level above the individual unit ...Each unit's approach...may be different, which tends to degrade OJT effectiveness." The Navy considers its Personnel Qualifications Standards as excellent roadmaps to sound, standardized OJT, and it is working to complete PQS's for those skills that do not yet have them. The Marine Corps has developed an Individual Training Standards system; when fully implemented, the system will identify individual training requirements by grade and specialty.
For further standardization, both the Navy and Marine Corps appear to need renewed emphasis and support of OJT at all command levels. Both should consider adding blocks of instruction on training management to Professional Military Education courses.

The Air Force has centrally prepared, standardized lists of OJT tasks for each specialty. However, these have been found to be so general that they must be extensively modified locally to fit particular jobs. The Air Force is developing Standardized Position Oriented Training (SPOT) task listings from occupational survey data. SPOT is intended to define training objectives for each position in a given specialty.

d. Lack of training aids and devices (A,N,MC). The Army requests support for additional funding for extension training materials in FY 1981 and 1982 and funding rising to a $20 million per year level in FY 1983 and FY 1984 and about $10 million per year thereafter. The funds would support development and production of correspondence courses, educational television, skill performance aids (SPA's), training extension courses (TEC), and the Job Training Program. These materials make the supervisor's training job easier. The Marine Corps is considering adopting the Army's SPA's and is budgeted to procure applicable TEC packages. The Marine Corps and the Air Force are looking into applications of computer assisted instruction to OJT.

The prime focus of Navy's initiatives in this area is in training devices: various land-based propulsion plants, mobile Pierside Combat Systems Trainers, etc. The Navy is also putting additional emphasis on the development of job performance aids in a variety of formats.

e. Paperwork vs. performance (AF). The Air Force has experienced a problem in OJT that is typical of the bureaucratic hardening of the arteries that crops up in mature organizations. Dedicated OJT managers at the local level are intended to be used as advisors and coordinators for the whole spectrum of local training. However, the Air Force reports that "in practice, the OJT monitor frequently is utilized as no more than a record keeper and statistician." The Air Force has streamlined OJT management so that attention can be focused on the substance rather than the form of the OJT program. An OJT Steering Committee now meets at least annually to help retain program effectiveness.

The other Services do not mention a problem of this sort, although something similar is likely to occur in any system that relies on a check-off for tasks learned--e.g., in keeping Job Books in the Army. "Paper training," like "paper maintenance," is an ancient phenomenon. As a minimum, the other Services can guard against reliving the Air Force experience as their OJT systems are further developed.

D. OTHER OJT ISSUES

The Service reports and interplay during this study have indicated a few other issues related to OJT that deserve fuller discussion.

1. The Role of the Operator. A traditional villain for maintenance problems, at least as viewed by organizational maintenance personnel, has been the equipment operator--e.g., the tank crew, bulldozer operator, or radioman. Operators have a great capacity for causing unnecessary work for supporting maintainers by abusing the equipment, failing to perform prescribed preventive maintenance or doing it incorrectly, or attempting repairs they are not authorized or trained to do. The Services' reports and the Interim Report of the Ad Hoc Group on Near Term Maintenance Improvements either do not mention or do not emphasize this as a problem. It seems clear, however, that all operators who have a maintenance role, or have a capacity for creating maintenance problems, must receive adequate formal schooling and OJT on their maintenance duties. Thus any OJT reforms aimed at improving maintenance must include consideration of operators as well as maintainers.

2. The Effect of Unit Missions on OJT. Military units

may be divided, for discussion purposes, into three classes:

a. Continously operational units. By and large, these units do in peacetime the same types of tasks they do in wartime, although the tempo of operations may be slower. Most maintenance units fall into this class, as do some units such as MAC squadrons or Navy ASW patrol squadrons. Units that must be kept at a high state of readiness have similar characteristics.

b. Units whose main peacetime concern is training. This includes most Army and some Marine combat organizations and Air Force tactical units. The tempo of training and required state of readiness may vary considerably among units, but even high-readiness units are likely to experience some periods of more or less slack activity because of space and funding constraints on unit training.

c. Units whose operational tempo goes up and down. This includes all Naval vessels and Marine units that deploy periodically.

Clearly there are significant differences here that bear on the OJT problem. The Class a. units, depending on tempo of operations, may have difficulty in finding adequate time for structured OJT compared to the Class b. units. However, actual peacetime performance of wartime missions by Class a. units is ideal for that OJT that relies on learning through experience. While Class b. unit personnel can also learn through experience during unit training exercises, constraints on these exercises limit their value as a realistic way of learning individual skills. Class c. units have the opportunity for structured OJT while not deployed, and learning through experience while deployed, although the neatness of this picture is considerably disrupted by turbulence before and after deployments.

All of this seems to argue for some degree of differential treatment in structuring training for different types of units. It may be an error to rely very heavily on structured OJT for maintenance personnel who support continuously operational units; on the other hand, it may be quite feasible to use structured OJT in maintenance units that have a lesser workload. It is clearly incorrect to apply an identical philosophy in assigning tasks to OJT and formal schooling in all specialities. It also may be an error to use identical training patterns for all personnel in the same skill. The Air Force's efforts to identify training objectives for each job and to determine the relative capacity of units to assume OJT tasks are sound first steps in an area that needs fuller investigation.

Given the fact that some amount of diversion of unit personnel to work outside their specialties will probably

always be with us, it is proper to consider priorities in levying units for these non-skill-related duties. Various studies have shown that some maintenance units regularly work 12-14 hours a day and on weekends and have little time for structured OJT. Such units should be levied for duties outside the unit as little as possible. Other maintenance units work a standard 40-hour week, and could be used to replace the overloaded units on outside details or, better yet, help with their maintenance overload. Where maintenance overloads exist, other types of units less heavily committed can be given as much of the non-mission workload as possible. For the sake of morale, some degree of equity in assigning unpalatable non-mission tasks is desirable, but equity should not, by itself, drive the allocation process. One assumes that responsible commanders are already acting on these factors, but a check by the Services could prove useful.

3. Possible Faults in Maintenance Manpower Allocation.

a. Enough maintainers? If, as some evidence shows, some maintenance units are working 12-plus hour days and on weekends supporting units operating at less than full tempo, it is hard to see how they could possibly keep up in wartime. Furthermore, other maintenance units supporting the same units are said to be working normal hours. This may point to a misallocation of maintenance tasks, or it may point to a lack of enough maintenance personnel in the overworked units. Some reallocation of tasks and/or manpower authorizations, or perhaps some additional maintenance personnel overall, may improve conditions within the current state of training.

b. Too many apprentices? The Training and Education Directorate, OASD(MRA&L), has begun a study involving an analysis of training practices for maintenance tasks in the civilian sector. It is a safe bet that one finding will be that the comparative distribution of experience and responsibility will look something like this:

	DoD	Civilian Sector
Apprentices	Many	Few
Journeymen	Few	Many
Supervisors	More	Fewer

The present DoD personnel system encourages an over-reliance on apprentices. The civilian sector, on the other hand, probably makes considerable use of journeymen to teach the apprentices, a job that in DoD falls on the supervisors as a duty added to the task of supervising maintenance. The DoD distribution is less than optimal either for good maintenance or good OJT, and considerably less than favorable for doing both jobs at the same time. Studies by Robert Gay of the RAND Corporation several years ago showed that the total

post-school productivity of an Air Force first-term electronics technician was only about 55 percent of the productivity of a second termer over the same length of time. DoD has too many first termers and too few journeymen for good maintenance and good OJT. Better retention would be a great help in this regard, but further action to build up the journeyman population and reduce the apprentice population is needed. While this action would have a cost, probably a high one, in terms of retaining people at the journeyman level, it has a potential for very large savings in training. The numbers of entrants would go down, so, assuming the amount of training per person stayed about the same, the total amount of school training would go down. At the same time, the quality of OJT and the quality of maintenance would go up.

c. Lack of dedicated training personnel for OJT. With certain exceptions--the Air Force's OJT monitors and Field Training Detachments, the staffs of the Navy's Fleet Training Centers, the staff of the Seventh Army Training Center, etc.--OJT programs are almost entirely without dedicated manpower. Typically, there are no student/trainee authorizations in OJT programs, nor are there authorizations for extra supervisors. Manpower authorizations in most deployable units are established in accordance with projected wartime needs; since there is not much training in committed units in wartime, there are no full-time training managers (except insofar as Air Force OJT monitors fill this function). Training management thus falls on undermanned operations staffs, on people pulled out of their normal positions, and on various people who manage training on an additional-duty basis.

The policies that lead to this situation are short-sighted. The CETRM Report told the other Services that they should examine the Air Force system of OJT monitors and possibly adopt a similar solution. The Army has stated that it was considering authorizing full-time unit training managers but has not done so because the concept has never been able to win out in the competition for scarce manpower. The same situation apparently applies to the Marine Corps and Navy. Everyone agrees that OJT is important, and it will remain important regardless of any changes in formal schooling. The Army, in particular, spends very substantial funds to produce material to support OJT. A judicious application of dedicated manpower in the field to help make OJT work better should pay large dividends. There is reason to think that adding this manpower to field units could do more to raise the overall state of training than adding the same amount of manpower to the school system. If such manpower is added, it should be specifically trained in training management.

The Army, Navy and Marine Corps should re-think this issue.

4. Resource Implications of the Formal School-OJT Break. This issue has been alluded to here and there in this report and needs to be pulled together.

a. OJT cost. Robert Gay's studies for RAND several years ago brought out the fact that OJT has a cost in forgone productivity and investment of supervisory time. The first-term graduate of a formal school (and Gay's work centered around Air Force electronics technicians, all of whom were school trained) has negative productivity for his first several months in a unit in the sense that the work he accomplishes is worth less than the time his supervisor must devote to him. Even after the servicemember crosses over into positive productivity he rises only slowly up the productivity curve and becomes fully productive only after several years.

This tells us something about the total cost of OJT, but not in terms that help much in determining the proper formal school-OJT break, since the pattern of negative productivity followed by slowly rising productivity applies no matter how much schooling the trainee has. More school training has the effect of accelerating the growth of productivity but not eliminating the pattern of growth. In addition, better OJT may accomplish the same rate of acceleration as more schooling. We know the cost of additional schooling down to the last dollar but we don't know how to calculate the cost of getting the same results from improving OJT. Until we do, we can't use cost as a factor in determining the best formal school-OJT break. Some research work being done by the Air Force may help to shed some light on this matter.

b. Availability of manpower. Most of the Services currently have a finite supply of manpower, or at least of manpower they feel they should accept, to fill a more or less fixed force structure. They also have shortages, especially in NCO's. Thus, decisions on the formal school-OJT break involve implicit or explicit consideration of how to allocate manpower shortages. Increasing the length of schooling draws down the fill of units. Decreasing the length of schooling may allow a complete unit fill but also lays a heavy OJT burden on the unit. It is not easy to decide which situation is worse or how to determine the most favorable compromise.

c. Vulnerability of resources for schools. When resources are short, formal schools are vulnerable to cuts. They are visible, their costs and manpower consumption are clear, they are a "non-combat" activity. OJT may have an advantage in this respect. Most OJT resources are obscure and are allocated to combat units or to units that more or less directly support combat. This factor may be worth considering in decisions on the formal school/OJT break.

5. Contract Support. Contract support can be used to improve maintenance training in a variety of ways: replacing diverted unit personnel in community support tasks, assuming excessive maintenance workloads (thus allowing time for training), helping to solve NCO shortages by assuming a formal schooling role, or assisting directly in OJT, as is being done in the Navy to some extent and also, perhaps, in the other Services. The Ad Hoc Study Group on Near Term Maintenance Improvements is considering a proposal to place contract personnel in a limited number of selected maintenance units to act, essentially, as OJT instructors and advisors. Such a solution could have definite advantages, especially as it may be one of the few practicable ways to apply a quick fix to part of the maintenance problem. For maximum benefit, however, this approach should meet the following conditions, which it is understood the Ad Hoc Study Group intends to follow:

- It should be applied to known maintenance bottlenecks.

- It should be done in a controlled way by designing measurements of improvement in maintenance performance to compare with performance in units without this support. This way it could serve as a test of the concept rather than just a one-shot fix whose value would decay over time.

- The contractors selected would have to be (1) more knowledgeable than the regular supervisors and (2) familiar with Service teaching methods and materials.

Two other considerations must be kept in mind in making any broader use of this approach. First, there are limitations on the feasibility and willingness of contract personnel to deploy with units or to continue support under wartime conditions. Second, there has been a strong historical tendency for contractors to recruit their workers out of the Services, thus exacerbating the retention problem.

6. A Total Approach to Better Maintenance. It is universally agreed that DoD has a maintenance problem. It is not yet known, however, how to apportion the root causes of the problem among the many factors that affect maintenance or how best to allocate effort and resources among these factors to solve the problem.

Maintenance has always been a function notorious for finger-pointing. Operational unit commanders point to unresponsive support maintenance, doubtful competence among maintenance managers, overly fragile equipment and other culprits outside their own jurisdictions. Maintenance unit commanders point to poor operator maintenance, command inattention to maintenance in operational units, and weak back-up support.

Everyone points to the suppliers of repair parts, who in turn point to improper ordering practices and hoarding by users and to failures by those officials who restrict the size of parts inventories. Training managers are favorite targets for blame from all the other players. There is some truth to all of these allegations, but views from any single point are not much help in designing a comprehensive solution.

This present study shows that training is part of the problem, but there is no reason to think that is all of the problem. Similarly, training can make a major contribution to a solution, but it can't, by itself, solve the whole problem. The point is that a cost-effective solution to the maintenance problem must be a balanced solution and not one that relies excessively on reforms in only one or two of the many factors -- good maintenance management, an effective repair parts supply system, proper allocation of maintenance personnel in terms of numbers and experience levels, etc., as well as adequate training -- that go into making good maintenance.

E. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions. There are problems in current systems of training maintenance personnel, and specific problems in OJT systems. Some of these problems can be solved by reforms to Service training systems; others, while they can be mitigated to some extent by improving various aspects of training, require solutions beyond the jurisdiction of training managers.

a. An appraisal of Service OJT systems. Based on what has been learned in this study, a thumbnail appraisal of existing Service OJT systems can be made.

(1) Air Force. The Air Force is listed first because it has the most mature OJT program, backed by the most research, planning, and dedicated manning. Furthermore, the Air Force program has the greatest degree of internal acceptance as an integral part of the training system; by contrast, there is some tendency in the other Services to treat OJT as a stop-gap to be used when all else fails. Consequently, most solutions put forward by the Air Force (with the exception of the reversion to more school training, which is dealt with later) are in the nature of rather minor fixes to a system that is already fundamentally sound.

On the other hand, the Air Force, at least at present, is in better shape than the other Services with regard to most of those problems that hurt OJT but that trainers can't do much about. Any other Service would gladly swap problems with the Air Force. The Air Force currently has a less severe

NCO shortage, trained specialists to help units train, and probably less of a turbulence problem. The Air Force also gets the highest cut of readily trainable enlistees. Consequently, what works in the Air Force may not necessarily work as well in the other Services. The Air Force OJT system would probably be less productive, although still fundamentally sound, if the Air Force had the same problems as the other Services.

(2) Army. The Army has most of the ingredients for a very good OJT system, and will be in an even better position when its NCOES and Skill Qualification Test program have been fully implemented. While the OJT system is hurt badly by the NCO shortage, turbulence, etc., it appears that moves the Army is taking to activate commanders, supervisors and trainees to make OJT work will allow a fairly good program.

(3) Marine Corps. The Marine Corps program, like the Army's, seems to need to generate more motivation at all levels for OJT success. The Marine Corps is already moving toward adopting some Army teaching aids; it could probably help its program, in spite of the NCO shortage and turbulence, by adopting other aids for its NCO instructors.

(4) Navy. With the exception of the very good training offered by the Fleet Training Centers, the main feature of the Navy OJT program, as compared to the programs of the other Services, is lack of standardization: among the surface, subsurface and air communities, among various skills, and among units. Actions to complete its program, using strong central support and emphasis, should bring substantial improvements within limits imposed by the NCO shortage and other constraints. The Navy is working on a number of imaginative initiatives pertinent to its operational environment.

b. Solutions. This study surfaces no reason to turn down out of hand any of the solutions put forth by the Services in their reports. If anything, more new solutions are needed by some Services. Each Service can learn something from the experience, ideas and initiatives of each of the others, and the DoD training community should continue to work together to this end.

Among the solutions discussed, a well-conceived test program of contract assistance to support OJT in maintenance problem areas would probably pay off quickest. The next quickest would be more NCO training in problem maintenance skills, both for Army and Air Force, which have proposed it, and also the Navy and Marine Corps, which probably should.

The best decision point for most initiatives requiring new resources is POM 83. The Service construction of their

POM's will provide a definitive picture of how the initiatives rate among other Service priorities. The Services should provide the Training and Education Directorate the needed data and justification to protect or, as appropriate, add to the Service initiatives.

Funds that the Army proposes to be added to the FY 1981 ($6.0 million) and 1982 ($10.4 million) budgets for support of NCO TDY to school and more training extension materials are not likely to be available unless substantial funds are added to the budgets for these two years. It would probably be more realistic for these to be POM 83 initiatives.

With regard to action by Air Force (or any other Service) to move training from OJT to formal schools, the Training and Education Directorate is openminded and prepared to back sound proposals if need (and capability to assign additional staff) is persuasively demonstrated. However, the more precisely additional schooling is tied to specific maintenance problems, the more likely it is to gain acceptance.

c. Resources. The funds and manpower associated with the solutions put forward by the Services are shown in the attached Resource Annex and, in greater detail, in the Service reports. Briefly, the cost of all solutions ranges from $97 million to $127 million per year, FY 1983-87. Of the total, $50 million to $60 million per year is already in approved Service programs; of the remaining "new money," about $30 million is attributable to the Air Force solution of increased course lengths for initial skill training. About 93 percent of the total additional unprogrammed military manpower (about 2900 of 3100 spaces, FY 1983-87) is associated with the same solution. The other big-money items among the unprogrammed solutions are the Army proposal for increased training extension materials ($10-20 million per year, 1983-87) and the Navy's proposals for procurement of two 1200 PSI propulsion plant simulators (a total of $28.9 million in FY 1984 and 1985) and additional pierside van trainers (a total of $12.5 million, FY 1983-85). The other unprogrammed solutions are relatively low-cost--from $0.1 million to a maximum of $2.8 million per solution per year over the POM 83 period.

All of the Service resource estimates appear to be reasonable statements of the resources that would be required if the associated solutions were adopted.

2. Recommendations.

No specific recommendations are made in this report for solutions to shortages of NCO's, diversion from training or personnel turbulence. However, it is recommended that the serious degradation of maintenance training, and maintenance itself, caused by these conditions be prominently featured

in justification of proposals to alleviate these problems.

Specific recommendations:

a. That ASD(MRA&L) support (1) specific Service proposals for increased schooling of junior, career-committed NCO's in maintenance skills; and (2) some additions to Army, Navy and Marine Corps field unit staffs to support maintenance OJT (at least if those Services are prepared to support the initiative).

b. That ASD(MRA&L) approve in principle initiatives proposed by the Services (less increased formal initial skill training) to improve maintenance training, with decisions to be made in the review of POM 83.

c. That ASD(MRA&L) reserve judgment, without prejudice, on increased formal initial skill training until the review of POM 83.

d. That the Services:

(1) Continue to identify further proposals for improved maintenance training, especially initiatives discussed in this report, for possible inclusion in POM 83. Specifically, the Services that have not already done so should consider adopting the initiatives listed in paragraph E.2.a. above.

(2) Emphasize ISD analyses in maintenance skills that are known problems to determine specific requirements for adjustments to the formal school-OJT break.

(3) Continue close liaison with each other and the Training and Education Directorate on this subject.

e. That the Services, the Training and Education Directorate and other interested parties continue to work together cooperatively toward a comprehensive solution to the overall maintenance problem.

Attachment: Resource Annex

RESOURCE ANNEX TO REPORT ON THE OJT STUDY TASK
RESOURCES RELATED TO SERVICE PROPOSALS

The following six pages compile in tabular form the funds and manpower the Services, in their reports, estimate they would need for the various solutions presented in the reports. The solutions vary from actions already started and in Service programs and budgets to actions not yet formally approved within the Services. Those requiring new resources (i.e., those not in approved programs or budgets) are marked with an asterisk (*); in some cases, the resource estimates related to these solutions are not yet refined to budget-quality data.

Table 1

ARMY

Funding ($ in Millions)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
Training of Trainers (budgeted)	6.2	12.2	15.0a/	15.0 a/	15.0a/	15.0a/	15.0a/
Training of Trainers (unbudgeted)	0.2*	0.2*	0.2*	0.2*	0.2*	0.2*	0.2*
NCOES Improvement	-	13.7	17.2	17.2	18.0	18.6	18.6
Extension Training Materials	5.8*	9.6*	20.0*	20.0*	10.1*	10.1*	10.1*
Bn Training Management System	-	0.6*	0.6*	0.6*	0.6*	0.6*	0.6*
Incentive Program		Minor additions/adjustments not yet quantified					
Improve Feedback		Minor additions/adjustments not yet quantified					
Total, Army	12.2	36.3	53.0	53.0	43.9	44.5	44.5
(In Program/Budget)	(6.2)	(25.9)	(32.2)	(32.2)	(33.0)	(33.6)	(33.6)
(Not in Program/Budget)	(6.0)	(10.4)	(20.8)	20.8	(10.9)	(10.9)	(10.9)

Manpower (Military/Civilian)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
Training of Trainers	0/10	0/10	0/10	0/10	0/10	0/10	0/10
NCOES Improvements	-	324/0	530/0	512/0	512/0	512/0	512/0
Extension Training Materials	2/10*	2/10*	2/10*	2/10*	2/10*	2/10*	2/10*
Bn Training Management System	-	15/3 *	15/3 *	15/3 *	15/3 *	15/3 *	15/3 *
Incentive Program		Minor additions/adjustments not yet quantified					
Improve Feedback		Minor additions/adjustments not yet quantified					
Total, Army	2/20	341/23	547/23	529/23	529/23	529/23	529/23
(In Program/Budget)	(0/10)	(324/10	(530/10	(512/10)	(512/10)	(512/10)	512/10
(Not in Program/Budget	(2/10)	(17/13	(17/13	(17/13	(17/13)	(17/13)	(17/13)

* Not in program/budget
a/ Preliminary estimate

Table 2

NAVY

Funding ($ in Millions)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
PQS Program	1.2	1.2	1.5*	1.5*	1.5*	1.5*	1.5*
PMS	9.0	9.0	10.0	10.0	10.0	10.0	10.0
2 1200 PSI Prop. Plant Simulators	-	-	-	16.8*	12.1*	0.2*	0.2*
1200 and 600 PSI Hot Plants	1.7	1.9	1.5	1.7	1.9	2.1	2.3
Pierside Van Trainers	-	-	2.5*	5.0*	5.0*	-	-
SSPOT	-	0.2*	0.5*	2.0*	2.0*	2.0*	2.0*
On-Board Maint. Training	3.5	3.5	3.5	-	-	-	-
SQIP	5.5	5.5	5.5	-	-	-	-
Total, Navy	20.9	21.3	25.0	37.0	32.5	15.8	16.0
(In Program/Budget)	(20.9)	(21.1)	(20.5)	(11.7)	(11.9)	(12.1)	(12.3)
(Not in Program/Budget)	-	(0.2)	(4.5)	(25.3)	(20.6)	(3.7)	(3.7)

Manpower (Military/Civilian)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
2 1200 PSI Prop. Plant Simultators	-	-	-	48/0*	94/2*	128/2*	128/2*
1200 PSI Simulator(Newport)	59/1	59/1	64/1	64/1	64/1	64/1	64/1
1200 and 600 PSI Hot Plants	154/0	154/0	110/0	110/0	110/0	110/0	110/0
Pierside Van Trainers	10/0	40/0	50/0*	70/0*	90/0*	90/0*	90/0*
Total, Navy	223/1	253/1	224/1	292/1	358/3	392/3	392/3
(In Program/Budget)	(223/1)	(253/1)	(174/1)	(174/1)	(174/1)	(174/1)	(174/1)
(Not in Program Budget)	-	-	(50/0)	(118/0)	(184/2)	(218/2)	(218/2)

*Not in Program/Budget

Table 3

MARINE CORPS

	Funding ($ in Millions)						
	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
TSA/Task Analysis	-	0.1	0.1	0.1	0.1	0.1	0.1
Training Extension Course Lessons	-	0.8	0.6	0.5	0.5	0.5	0.5
Computer Based Instruction	-	0.6	1.5	1.5	1.5	1.5	1.5
Total, Marine Corps	-	1.5	2.2	2.1	2.1	2.1	2.1
(In Program/Budget)	-	(1.5)	(2.2)	(2.1)	(2.1)	(2.1)	(2.1)
(Not in Program/Budget)	-	-	-	-	-	-	-

Manpower: None

Table 4

AIR FORCE

Funding ($ in Millions)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
Lengthen Initial Skill Training	-	-	30.1*	28.8*	30.1*	28.9*	28.9*
NCO TDY to School	-	2.9	2.9	2.9	2.9	2.9	2.9
Training Developments	-	-	1.0*	1.5*	1.9*	2.2*	2.8*
Training Decision System	-	-	0.5*	0.4*	0.4*	0.3*	-
Integrated Training System	-	0.9	1.2	1.3	1.6	2.0	-
Total, Air Force	-	3.8	35.7	34.9	36.9	36.3	34.6
(In Program/Budget)	-	(3.8)	(4.1)	(4.2)	(4.5)	(4.9)	(2.9)
(Not in Program/Budget)	-	-	(31.6)	(30.7)	(32.4)	(31.4)	(31.7)

Manpower (Military/Civilian)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
Lengthen Initial Skill Training	-	-	2722/0*	2889/0*	3013/0*	2891/0*	2891/0*
Training Developments	-	-	13/7*	36/13*	49/13*	49/14*	49/14*
Total, Air Force	-	-	2735/7	2925/13	3062/13	2940/14	2940/14
(In Program/Budget)	-	-	-	-	-	-	-
(Not in Program/Budget)	-	-	(2735/7)	(2925/13)	(3013/13)	(2940/14)	(2940/14)

*Not in Program/Budget

Table 5

DOD FUNDING SUMMARY ($ IN MILLIONS)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
In Program/Budget							
Army	6.2	25.9	32.2	32.2	33.0	33.6	33.6
Navy	20.9	21.1	20.5	11.7	11.9	12.1	12.3
Marine Corps	-	1.5	2.2	2.1	2.1	2.1	2.1
Air Force	-	3.8	4.1	4.2	4.5	4.9	2.9
DoD	27.1	52.3	59 0	50.2	51.5	52.7	50.9
Not in Program/Budget							
Army	6.0	10.4	20.8	20.8	10.9	10.9	10.9
Navy	-	0.2	4.5	25.3	20.6	3.7	3.7
Marine Corps	-	-	-	-	-	-	-
Air Force	-	-	31.6	30.7	32.4	31.4	31.7
DoD	6.0	10.6	56.9	76.8	63.9	46.0	46.3
Total							
Army	12.2	36.3	53.0	53.0	43.9	44.5	44.5
Navy	20.9	21.3	25.0	37.0	32.5	15.8	16.0
Marine Corps	-	1.5	2.2	2.1	2.1	2.1	2.1
Air Force	-	3.8	35.7	34.9	36.9	36.3	34.6
DoD	33.1	62.9	115.9	127.0	115.4	98.7	97.2

Table 6

DOD MANPOWER SUMMARY (MILITARY/CIVILIAN)

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
In Program/Budget							
Army	0/10	324/10	530/10	512/10	512/10	512/10	512/10
Navy	223/1	253/1	174/1	174/1	174/1	174/1	174/1
Marine Corps	-	-	-	-	-	-	-
Air Force	-	-	-	-	-	-	-
DoD	223/11	577/11	704/11	686/11	686/11	686/11	686/11
Not in Program/Budget							
Army	2/10	17/13	17/13	17/13	17/13	17/13	17/13
Navy	-	-	50/0	118/0	184/2	218/2	218/2
Marine Corps	-	-	-	-	-	-	-
Air Force	-	-	2735/7	2925/13	3062/13	2940/14	2940/14
DoD	2/10	17/13	2802/20	3060/26	3263/28	3175/29	3175/29
Total							
Army	2/20	341/23	547/23	529/23	529/23	529/23	529/23
Navy	223/1	253/1	224/1	292/1	358/3	392/3	392/3
Marine Corps	-	-	-	-	-	-	-
Air Force	-	-	2735/7	2925/13	3062/13	2940/14	2940/14
DoD	225/21	594/24	3506/31	3746/37	3949/39	3861/40	3861/40

DEPARTMENT OF THE ARMY

OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
WASHINGTON, D.C. 20310

REPLY TO
ATTENTION OF

DAMO-TRI

14 NOV 1980

MEMORANDUM THRU ~~CHIEF OF STAFF, UNITED STATES ARMY~~ 14/11
~~ASSISTANT SECRETARY OF THE ARMY (MANPOWER AND RESERVE AFFAIRS)~~ 17 NOV 1980

FOR ASSISTANT SECRETARY OF DEFENSE (MANPOWER, RESERVE AFFAIRS AND LOGISTICS) (PROGRAM MANAGEMENT)

SUBJECT: OJT Study Task Report

In response to your memorandum, subject: On-The-Job Training (OJT) Study Task, dated 31 July 1980, attached is the Army's report on the subject assembled as follows:

a. Chapter 1 outlines the current Individual Training in Units process: skills are learned through performance of duties under competent supervision in an approved, planned program. It also identifies associated problems such as shortage and qualification of noncommissioned officers, multiple competing requirements, force modernization, inadequate feedback and lack of incentive (TAB A).

b. Chapter 2 proposes alternative strategies that will alleviate many of the problems associated with Individual Training in Units. These strategies are: timely training of trainer, improvements to the noncommissioned officer education system, increased emphasis on extension training materials, Battalion Training Management System, and development of an incentive program and feedback system (TAB B).

c. Chapter 3 provides cost/benefit data for the strategies proposed in Chapter 2 (TAB C).

d. Chapter 4 summarizes the alternative strategies and recommends their implementation consistent with available resources. (Tab D)

FOR THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS:

James C. Smith

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JAMES C. SMITH
Major General, GS
Director of Training

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LTC Maher/56818

CHAPTER I, PART I

The Army defines On the Job Training as "a training process whereby students or trainees acquire knowledge and skills through actual performance of duties under competent supervision, in accordance with an approved, planned program." (Page 186 AR 310-25).

The type of training within the Army that is most closely aligned with the OSD understanding of OJT is called Individual Training in Units.

The Army divides training in units into:

1. Mission performance training.
2. Individual training.
3. Refresher training.

Individual Training in Units focuses on critical task training and common task training. Definitions of the above terms follow:

Mission Performance Training - Collective training focusing on unit mission accomplishment.

Individual Training - Training that prepares the individual to perform specified duties and tasks related to his assigned Military Occupational Specialty and duty position.

Critical Task Training - Training that focuses on individual knowledge or performance of skills peculiar to his Military Occupational Specialty.

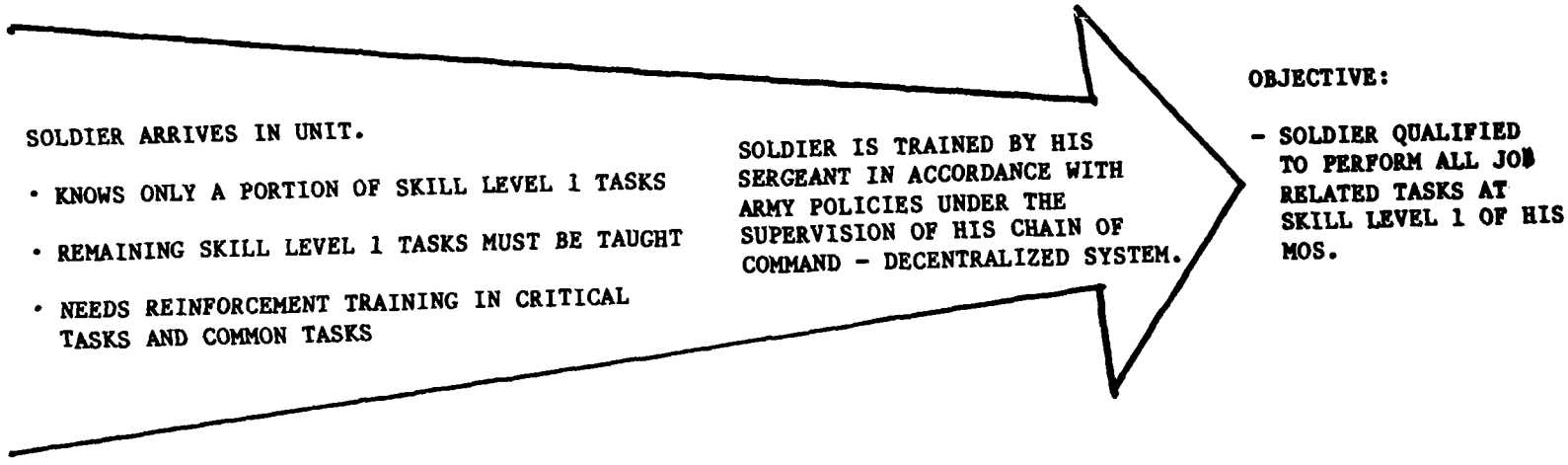
Common Task Training - Training that focuses on individual knowledge or performance of skills required by multiple MOS's (survival training, etc.).

Refresher Training - Training given to a previously trained soldier that results in the soldier regaining or improving Soldier's Manual task standard proficiency.

The following diagrams explain the system in greater detail.

INDIVIDUAL TRAINING IN UNITS

- THIS EXAMPLE DEPICTS HOW THE PROCESS WORKS FOR A SOLDIER ASSIGNED TO HIS FIRST UNIT FOLLOWING INITIAL ENTRY TRAINING (IET)



- TIME REQUIRED VARIES

THE PLAYERS

- COMMANDERS, SERGEANTS, AND SOLDIERS WORK TOGETHER TO ACCOMPLISH INDIVIDUAL TRAINING IN UNITS
- COMMANDERS ROLE DEFINED IN TRAINER'S GUIDE*
  - PROVIDE SUFFICIENT NUMBERS OF TRAINED NCO'S TO CONDUCT AND SUPERVISE THE CONDUCT OF TRAINING
  - ORGANIZE RESOURCES FOR TRAINING
  - MAKE TIME AVAILABLE
  - CERTIFY MOS PROFICIENCY
- SERGEANTS CONDUCT TRAINING FOR THE SOLDIERS SERVING UNDER THEM
  - SOLDIERS MANUALS* PROVIDE TASKS, CONDITIONS AND STANDARDS
  - DRAW UPON CORRESPONDENCE COURSES, TM'S, AUDIOVISUAL PRODUCTS AS APPROPRIATE
  - WORK TRAINING INTO DAILY ROUTINE
  - ACCOUNT FOR TRAINING PROGRESS BY USE OF JOB BOOKS*
  - PROVIDE FEEDBACK TO CHAIN OF COMMAND
- SOLDIERS RECEIVE TRAINING
  - STUDY SOLDIERS MANUALS AND EXTENSION TRAINING
  - DEMONSTRATE PROFICIENCY IN TASKS UNDER A GO-NO GO EVALUATION SYSTEM ADMINSTERED BY SERGEANTS

* COPIES OF TRAINERS GUIDE (PREVIOUSLY CALLED COMMANDERS MANUAL), SOLDIERS MANUAL AND JOB BOOK FOR MOS 63C (TRACK VEHICLE MECHANIC) FORWARDED SEPARATELY.

THE PLAYERS

- COMMANDERS MANAGE PROGRAMS AS REQUIRED
- FEEDBACK TO COMMANDERS ON INDIVIDUAL TRAINING COMES THROUGH:
  - CHAIN OF COMMAND
  - RESULTS OF SQT
  - INSPECTIONS
  - PUBLICATIONS
- COMMANDERS MAKE RECOMMENDATIONS TO TRADOC ON CHANGES TO PROGRAM DESIGN AND TRAINING MATERIALS.

(METHODOLOGY FOR DETERMINING TASKS TO BE TAUGHT BY INDIVIDUAL TRAINING IN UNITS IS CONTAINED IN TRADOC CIR 351-80-7 AND WILL BE FORWARDED SEPARATELY)

CHAPTER I, PART II

FACTORS DEGRADING INDIVIDUAL TRAINING IN UNITS

PROBLEM	CONSEQUENCE	IMPACT	CORRECTIVE ACTION
Army short NCO's in units	• Insufficient numbers of trainers • Trainer grade substitution (E4 for E5, 6) means inexperienced trainers take on more than they are ready to handle • Commanders reluctant to send NCO's to resident courses taking them away from units	Serious Degradation	• Ongoing actions to improve retention • New enlisted distribution plan • Increase use of TEC*, ACCP*, JTP*, SPAs* and ETV*
Military manpower used in community support as result of loss of civilian strength	• Shortage of NCO's in units compounded • Soldiers training opportunities reduced considerably	Serious Degradation	• Increase Civilian end strength • Provide funds for overhire • Contract the function
Many NCO's not fully qualified as technical trainers	• Proper execution of Individual Training in Units inhibited	Serious Degradation	• NCO Development Program (NCODP) • Ongoing actions/ programs to improve Noncommissioned Officer Education System • Better management policies to get NCO's to appropriate training • Increased emphasis on ACCP, JTP, SPAs, TEC and ETV

* SPAs - Skill Performance Aids
* JTP - Job Training Program
* TEC - Training Extension Course
* ACCP - Army Correspondence Course Program
* ETV - Educational Television

PROBLEM	CONSEQUENCE	IMPACT	CORRECTIVE ACTION
Multiple Competing Requirements	• Low priority for Individual Training in some cases • Weak or partially executed Individual Training programs	Moderate Degradation	• More effective tng mgmt thru Battalion Training Mgmt Sys (BTMS) • Emphasize in Bn/Bde pre-command courses • Command Attention at the highest levels • Establish training as the first priority in units
Force Modernization	• Limited "Hands-On" experience of NCO trainers • Assignments on mix of old and new equipment will limit experience on both • Soldiers in repair/rebuild jobs may face more complex tasks	Moderate Degradation	• Improve Personnel Management policies • Better new equipment tng forecasting • Consideration of the man/machine interface early in the development stage • Design simplification
Inadequate Feedback on Individual Training in Units	• CDR responsible for program receives too little feedback too late • Feedback on adequacy of training materials not integral part of system	Moderate Degradation	• Devise, formalize and institutionalize feedback system
Lack of Positive Incentive	• Trainer not motivated to provide quality training • Trainee not motivated to grasp training	Moderate Degradation	• Provide mechanism for positive incentive for trainer and trainee in addition to passing the SQT • Lengthen company level command tours

CHAPTER II - ALTERNATIVE STRATEGIES

A. PROBLEM: Many NCO's not fully qualified as technical trainers

STRATEGY #A1: Timely training of trainer

DESCRIPTION: Revised AR 351-1 provides for semi-centralized selection of personnel on promotion lists for schooling for that skill level. School attendance will, whenever possible, be TDY enroute during PCS. Revised AR 351-1 also strongly encourages commanders to send to school those NCO's who are serving in positions one or two grades above what they currently hold.

STRATEGY #A2: Actions/programs to improve the Noncommissioned Officer Education System (NCOES)

DESCRIPTION: Continuous efforts are being made throughout the training community to increase resourcing and make improvements in NCOES. CMF career patterns and individual tasks are being evaluated by TRADOC and MILPERCEN to determine new or revised training requirements.

STRATEGY #A3: Increased emphasis on and resourcing of Army Correspondence Course Program (ACCP). Educational Television (ETV), Job Training Program (JTP), Skill Performance Aids (SPA's) and Training Extension Courses (TEC).

DESCRIPTON: Extension training materials are designed to provide trainers, both in units and in institutions, with exportable, performance oriented training products. They are designed to provide soldiers and commanders with immediate access to high quality, self-paced multimedia instruction especially designed to assist in acquiring and maintaining skills critical to the soldiers on-the-job performance. The extension training materials are designed for use on an individual basis or by small groups under the supervision of a noncommissioned officer.

B. PROBLEM: Multiple Competing Requirements

STRATEGY #B1: Increased emphasis, utilization and institutionalization of the Battalion Training Management System (BTMS).

DESCRIPTION: Multiple competing requirements frequently relegate Individual Training to a low priority. However, more effective utilization of training time and materials will result in maximized training benefit in spite of competing requirements. Increased emphasis, utilization and institutionalization of the Battalion Training Management System at battalion level and below will assist NCO's in organizing training and effectively utilizing available time and materials to conduct quality training.

C. PROBLEM: Lack of Positive Incentive

STRATEGY #C1: Incentive Program

DESCRIPTION: Both trainer and trainee must be motivated to perform well in their respective roles in Individual Training. Positive incentive must be an integral part of that motivation.

D. PROBLEM: Feedback on Individual Training in Units

STRATEGY #D1: Improve feedback mechanism

DESCRIPTION: Feedback can be obtained through a mechanism designed and implemented to provide feedback to all levels in the areas of trainee skills, trainer skills, training materials and resource availability and use. Utilization of existing mechanisms such as SQT and Command and IG inspections can be modified to provide feedback.

STRATEGY #A1: *Timely training of trainer*

BENEFITS: Semi-centralized selection of personnel coupled with TDY enroute training will ensure soldiers get timely training and will result in better qualified/confident NCO trainers. The retained option by the commander to send personnel who are serving in positions requiring 1-2 grades higher than they hold insures training for the job as well as training for promotion.

RESOURCE REQUIREMENTS:	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86
Funds $M	6.6	12.6	.4+	.4+	.4+	.4+
Manpower (M/C)	0/16	0/16	0/16	0/16	0/16	0/16
Equipment	10 ATRRS Terminals ---------->					

RESOURCE STATUS:
___ Already programed or budgeted
_X_ Attainable through minor additions
___ Requires significant addition

STRATEGY #A2: *Actions/programs to improve the Noncommissioned Officer Education System (NCOES)*

BENEFITS: Provides for assignment of instructors to 109 new courses, analysis of 175 Military Occupational Specialties (MOS) for training requirements, development of 81 new courses, development/upgrade and conduct of essential training for 27,000 Automotive Mechanics and 600 Armored Vehicle Crewmen, upgrade of Advanced NCO Courses (ANCOC) to ISD Standards, Job and Task analysis for 158 MOS's at Skill Level 4, and development of merger training for 99 MOS Merger Points at the E-7 level.

RESOURCE REQUIREMENTS:	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86
Funds $M		13.7	17.2	17.2	18.0	18.6
Manpower (M/C)		324/142	530/323	512/305	512/305	512/198
Equipment		0	0	0	0	0

RESOURCE STATUS:
_X_ Already programed or budgeted (portions of PDIPS 3ST9, 3S67 and 3S81)
___ *Attainable through minor adjustments/additions*
___ Requires significant addition

STRATEGY #A3: Increased emphasis on and resourcing of Army Correspondence Course Program (ACCP), Educational Television (ETV), Job Training Program (JTP), Skill Performance Aids (SPA's) and Training Extension Courses (TEC).

BENEFITS: ACCP, ETV, JTP, SPAs and TEC are extension training materials that can be utilized to assist the trainer in organizing and conducting Individual Training in Units. These materials can help the NCO by providing usable trainer information to train soldiers. They are intended to support the formal training and experience of the NCO trainer - not as an alternative to them. Thus, adequate resourcing to bring these materials up to ISD standards and maintain their currency would greatly enhance the capability of the NCO as a trainer and enhance Individual Training in Units.

RESOURCE REQUIREMENTS:	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86
Funds ($M)	5.8	9.6	20.0	20.0	10.1	10.1
Manpower (M/C)	2/10	2/10	2/10	2/10	2/10	2/10
Equipment						

RESOURCE STATUS: ____Already programed or budgeted
____Attainable through minor adjustments/additions
__X__Requires significant addition

NOTE: JTP funds in AMS 819731 have been zeroed out in FY 83 and FY 84. DA PDIP 3SZ5 restores these funds as part of the TEC funding line. The TEC program has been restructured to meet the JTP requirement. This PDIP is in the Enhanced Level of the FY 82-86 program.

STRATEGY #B1: Increased emphasis, utilization and institutionalization of the Battalion Training Management System (BTMS).

BENEFITS: This initiative develops a standardized training management program that will allow commanders at all levels to manage available resources (time, $, people) to achieve maximum effectiveness in individual and collective training. Resources provide training developers and program managers, civilian salaries, TDY funds and supplies.

RESOURCE REQUIREMENTS:	FY 82	FY 83	FY 84	FY 85	FY 86
Funds ($M)	.56	.56	.56	.56	.56
Manpower (M/C)	15/3	15/3	15/3	15/3	15/3
Equipment	-	-	-	-	-

RESOURCE STATUS:
___ Already programed or budgeted
_X_ Attainable through minor additions (PDIP 57A7)
___ Requires significant addition

STRATEGY #C1: Incentive Program

BENEFITS: When both trainer and trainee are highly motivated to perform their individual training roles in an outstanding manner the quality of instruction and quantity learned is significantly enhanced.

RESOURCE REQUIREMENTS: Many of the more meaningful incentives resulting from a good Individual Training Program (e.g., job satisfaction) are attainable without program adjustments.

RESOURCE STATUS:
___ Already programed or budgeted
_X_ Attainable through minor adjustments/additions
___ Requires significant addition

STRATEGY #D1: Improve feedback mechanism

BENEFITS: Feedback mechanism can determine adequacy of Individual Training and training materials available in units.

RESOURCE REQUIREMENTS: Resource requirements for feedback mechanism cannot be quantified at this time; however, it is estimated that they will be attainable through minor adjustments/additions.

RESOURCE STATUS:
___ Already programed or budgeted
_X_ Attainable through minor adjustments/additions
___ Requires significant addition

Chapter IV - Conclusions

The strategies are universal in application in that they can be utilized to improve individual training in all career management fields. Since the focus of this effort is on improving maintenance skills, all strategies cited directly impact on maintenance training.

Strategy #A1 - Timely Training of the Trainer insures attendance at the Primary Technical Course or the Basic Technical Course when selected for promotion to E5/E6 or when assigned to a position authorized 1 or 2 grades higher than the soldier currently holds. The impetus is to get the NCO Trainer technically qualified and confident of his qualifications prior to his assignment to duties that may require the conduct of Individual Training in Units.

Strategy #A2 - Actions/programs to improve the Noncommissioned Officer Education System (NCOES) insure that the trainer receives training developed in the ISD Model at the appropriate merger point in his career. This strategy also analyzes MOSs to insure that the number of tasks associated with a particular MOS is reasonable and proposes restructuring when the number of tasks is unreasonable (CMF 63).

Strategy #A3 - Increased emphasis on and resourcing of ACCP, ETV, JTP, SPAS and TEC insures the quality of training materials available to both the trainer and the trainee.

Strategy #B1 - Increased emphasis, utilization and institutionalization of BTMS provides a standard training management program that allows commanders to manage available resources to maximize training effectiveness.

Strategy #C1 - Development of an incentive program will provide motivation for both trainer and trainee to perform well in their respective Individual Training roles.

Strategy #D1 - Improved feedback mechanism will provide opportunity for quality assurance for Individual Training in Units.

Strategies A1, A2, A3, and B1 are currently programed or in the process for FY 83-87 POM. Strategies C1 and D1 cannot be estimated at this time.

All Strategies are considered important to Individual Training in Units since they directly impact on one or more of those elements that interact in the conduct of Training- the trainer, the trainee, training materials and resources.

Consistent with available resources, each strategy identified above will be utilized to enhance Individual Training in Units.

DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20350

16 DEC 1980

MEMORANDUM FOR THE DEPUTY ASSISTANT SECRETARY OF DEFENSE
(PROGRAM MANAGEMENT)

Subj: On-the-Job Training (OJT)

Ref: (a) DASD(PM) Director of Training and Education memo of 6 Oct 1980

Encl: (1) Descriptions and Evaluation of current OJT programs
(2) Ongoing Programs/Alternate Strategies for Solving or Alleviating the Problems
(3) Alternative Strategies: Resources and Benefits
(4) Conclusions and Recommendations

In response to reference (a), enclosures (1) through (4) are submitted as the final report on the On-the-Job Training Study Task.

J. M. BOORDA
Principal Assistant
(Manpower & Reserve Affairs)

DESCRIPTION AND EVALUATION OF CURRENT OJT PROGRAMS

1. Definitions. The following definitions are pertinent to an understanding of ongoing programs in the OJT arena:

a. On-the-Job Training (OJT). Training in the actual job situation during daily operations and routine maintenance evolutions. OJT can be more narrowly defined as any pre-planned use of work resources in the work environment primarily for the purpose of training someone to produce work. OJT may be initial skill training or it can be proficiency training practiced on the job to reinforce training received in formal schools. Following a designated period of on-the-job training, an individual may, in some cases, achieve formal recognition of special knowledge and skills acquired through assignment of a Navy Enlisted Classification (NEC) designation.

b. On-Board Training. Training used by a command to provide permanently assigned personnel the necessary individual operator and maintenance technical training, individual watch station qualification and watch team training, and training in general military subjects. The training may be formal or informal. The conduct of on-board training is the responsibility of the unit commander and the training effort is managed within the existing unit organization. A unit Training Officer is normally designated along with a Planning Board for Training to provide formalized management. In addition to training that takes place within the individual unit, on-board training also embraces those short training courses ashore, at Fleet Training Centers, for example, which are available to the unit commander for use of his permanently assigned personnel on a returnable quota basis. OJT is an integral part of on-board training.

c. Navy Enlisted Classification (NEC). The NEC structure supplements the enlisted rating structure in identifying personnel with special knowledge and skills. The NEC coding system facilitates management control over enlisted skills and enhances efficient utilization of personnel in distribution and detailing. Formal schooling is the primary means of acquiring NECs in the surface community. Only 22% of existing surface NECs can be gained following a specified period of on-the-job training. Upwards of 80% of all aviation NECs can be acquired through OJT. However, it should be noted that the awarding of the aviation NECs following a designated period of OJT is normally preceeded by

structured training in the Fleet Repair and Maintenance Program (FRAMP).

d. Personnel Qualification Standards (PQS). The Personnel Qualification Standards Program is a qualification system for officers and enlisted personnel to perform certain duties. A PQS is a list of the minimum knowledge and skills required to qualify for a specific watch station, maintain specific equipment, or perform as a team member in a unit. PQS has been an established program in Navy surface units for the past nine years and more recently in aviation units. Its use is mandated in units where developed standards are applicable. PQS is not utilized where existing qualification programs predating PQS are in use, such as the submarine qualification program. The latter program uses watch station qualification cards which list the knowledge level/practical factors demonstration required to qualify at each watch station. The current emphasis of PQS development is to standardize and facilitate operator watch station qualification in surface ships while continuing the dual emphasis of both operator and maintenance technician PQS for designated aviation units. The PQS program is a qualification program and not a training program, but it does provide an objective for training, and serves as the key element of the unit training program.

e. Planned Maintenance System (PMS). The Planned Maintenance System (PMS) is a part of the overall Navy Ship's Maintenance and Material Management System (3M). The ship's 3M System includes all equipments installed in ships except fleet ballistic missile weapon systems, nuclear power plants, and associated test equipments. PMS provides each user with a simple and standard means for planning, scheduling, controlling, and performing planned maintenance of applicable equipment. PMS maintenance actions are the minimum required to maintain the equipment in a fully operable condition within specifications. These PMS procedures and the periodicities in which they are to be accomplished are contained on Maintenance Requirement Cards (MRC). MRC's provide the detailed procedures for performing the preventive maintenance and state who, what, where, how, and with what resources a specific requirement is to be accomplished. A unit's PMS record of accomplishment is closely monitored through formal inspection procedures. Aside from the exceptions previously noted, PMS is fully implemented in submarines. Within the aviation community, planned maintenance requirements which

are essentially equivalent to ship's PMS are an integral part of the Naval Aviation Maintenance Program (NAMP).

f. General Military Training (GMT). GMT is defined as the initial orientation and follow-up on-board training in those nontechnical areas which serve the purpose of preparing Navy personnel to fulfill the obligations of their oath of service, and providing guidance and information on matters affecting their welfare. The orientation courses are those which offer training in basic military subjects as part of the indoctrination into the Navy. Follow-up GMT is that training given on board ships and squadrons on a continuing planned basis to reinforce subjects covered in initial orientation or indoctrination. The original concept was to consolidate the training requirements of many independent programs which existed in the early 1960's, so they could be more effectively managed and supported. Over the years, however, the program has considerably increased in the depth of coverage.

2. Descriptions of current OJT Programs.

a. Ongoing OJT Programs fall into one of three categories depending upon the training setting and the identification of the trainees:

(1) Conventional OJT

(2) Formal OJT

(3) Contractor-assisted OJT

b. Conventional on-the-job training is conducted within the actual working environment with the trainee under the supervision of a qualified trainer. Formal OJT takes place in a classroom away from the unit, within the unit utilizing a Mobile Training Team, or within the unit utilizing a uniquely-equipped training van which can be placed in the unit or alongside the unit. Contractor-assisted OJT is a relatively new approach, currently being piloted in the surface community, designed to provide maintenance training on selected shipboard equipments. The contractor conducts a course of instruction in the ship and shipboard personnel perform equipment maintenance under contractor supervision.

c. The purpose of conventional OJT is to provide initial skill training to the individual reporting directly from recruit training and apprentice training, and additionally to

provide follow-on skill training to the Class "A" school graduate. Specific tasks to be taught through OJT to the recruit/apprentice training product are indentified in the Personnel Qualification Standards that have been implemented within the individual's ship or aircraft squadron. For the "A" school graduate, skills profiles which delineate the skills acquired by the trainee in the school are provided to his unit. Additionally, those skills that are listed in the Job Task Inventory for a particular rating (electronic technician, boiler technician) that were not addressed in the "A" school curriculum are identified. Either the unit OJT program must then provide for instruction to address these skills or an on-board training package focusing on these specific follow-on training needs must be developed to be placed in the unit. Individual progress with the conventional OJT program can be identified and documented through the Personnel Qualification Standards Program and performance on Advancement in Rate examinations.

d. The formal on-the-job training approach is designed to provide either (1) a more effective setting away from the unit for the training, i.e., a classroom close to the unit; (2) the services of a Mobile Training Team of experts not assigned to the unit to provide an intensive period of specialized training in a particular area, i.e., shipboard engineering watch team training; or (3) the services of a portable training van that can be brought to the unit to conduct specialized training in a particular area, i.e., shipboard combat systems. Formal classroom OJT is normally oriented toward individual training; the Mobile Training Team approach can be applied to both individual and team training. Use of portable training vans provides team training. Specific tasks to be taught in this mode are as identified in the conventional approach, and all skill levels of personnel are involved. Training progress through use of Mobile Training Teams or portable vans can be identified through testing or formal exercises conducted at the conclusion of the training period.

e. The contractor-assisted OJT approach has been restricted thus far to upgrading shipboard maintenance skills with regard to selected equipments that have historically been a maintenance burden. Structured on-the-job, hands-on maintenance training is provided for shipboard maintenance teams (shipboard personnel do the work) under contractor supervision. This is a team approach with the ship's maintenance supervisor directing his subordinates in the actual equipment maintenance/repair. Training progress can

be documented by measuring the effectiveness of the equipment repair (number of maintenance-free operating hours, number of reported equipment casualties, and the condition of equipment noted during routine planned maintenance actions).

3. Problems affecting OJT program success.

a. Lack of supervisory talent. The Navy is experiencing a major quantity and quality shortfall that impacts heavily on OJT efforts in operating units. A significant shortage of petty officers, E5-E9, degrades ship and squadron manning. This causes billets to be filled one and two grades below requirements. The significant numerical deficiency passes heavier workload and watch-standing responsibilities to junior personnel, with a resultant loss in both operational and maintenance OJT time. The quality shortfall forces inexperienced junior personnel to be in training to become supervisors, and dictates that the limited supervisors available will actually be performing a substantial portion of the required hands-on maintenance. Effective pursuit of vital in-place programs such as PQS and PMS is severely hindered when the required numbers and proper mix of supervisory talent are not present. The absence of this talent is the major problem impacting on the effectiveness of on-the-job training.

b. Lack of OJT Standardization. The absence of standardization regarding the role of OJT and the manner in which it is to be administered severely hinders its overall effectiveness. OJT is not a funded program and it lacks centralized management at any level above the individual unit. Varying degrees of internal management effectiveness frequently dictate that OJT will suffer if non-standardization, regarding managing training resources, is the rule. Each unit's approach to PQS and PMS may be different, which tends to degrade OJT effectiveness. An effective PQS program requires sufficient numbers of supervisory personnel to execute the program and there must be an established effort to qualify the supervisors. Additionally, the setting of realistic qualification goals and effective monitoring of qualification progress are essential to a successful PQS effort. Failure of a unit commander to fully support the Work Center Supervisor concept and failure to properly utilize these personnel in their intended role will diminish the effectiveness of OJT maintenance training associated with PMS. On-the-job technical training and general military training compete for the same limited training time, and the unit commander lacks

definitive direction as to how to address this conflict. Additionally, General Military Training is a directed program with certain offices and commands designated as sponsors for the elements of the GMT Programs. Commanding Officers of individual units are directed to organize, schedule, and conduct a GMT instructional program utilizing rather specific promulgated guidelines. Similar guidelines for effectively administering technical OJT do not exist. Although an attempt has been made to streamline the GMT program to alleviate the burden on operating units, the conflict remains. Some units handle this conflict more effectively than others. A more visible output of the training program may be the check-off that indicates an all-hands briefing on the Savings Bond Program or the Code of Conduct was conducted but the bottom line may be a missed OJT opportunity that was conveniently ignored. This lack of standardization and absence of specific program direction and support from echelons above the individual unit does impact heavily on the overall effectiveness of the OJT program.

c. Personnel instability. Operational units continue to experience an unacceptably high turnover of personnel. This is brought on by a variety of factors: attrition of first termers prior to completion of their initial tour, normal expiration of obligated service, execution of sea-shore rotation policies and reenlistment options, unexpected losses to meet higher priority operational commitments of other units, and policies that traditionally accommodate personnel shifts at certain periods in the operating cycle. A turnover rate of 55% of all enlisted personnel assigned was experienced in the Alantic Fleet during the past year. Stability of operating units suffers most just prior to and immediately following extended deployments. Personal hardships, drug problems, insufficient time remaining prior to EAOS, and personnel swaps all surface with great regularity prior to extended operations. Frequently, a unit will be forced into the "fresh start" mode with regard to OJT as the deployment begins. While undergoing regular overhaul, ships have historically suffered heavy personnel losses. One major combatant recently completed a regular overhaul with only ten people remaining from the crew that entered the overhaul period. Personnel instability makes it extremely difficult to pursue a meaningful watch qualification program, severely affects team training, and impacts on the orderly implementation of PQS and PMS. Attitudes of supervisors and trainees in a turbulent period of personnel turnover must receive high consideration. Personnel instability and the lack of

supervisory talent tend to negatively reinforce each other, with resultant damaging effects on a unit's OJT program.

d. Operational environment constraints.

(1) OJT in operating units is adversely affected by limited available underway training time and heavy demands upon individual units. The effectiveness of shipboard OJT is considerably degraded if operations from a unit's home port are characterized by infrequent underway periods, with a high percentage of the available underway time coming in the form of demanding operational commitments. Formal inspections and assist visits additionally serve as irritants working against the effectiveness of one's training program, generating an increased workload and an unbalanced allocation of unit resources.

(2) The nature of a ship's operating cycle introduces peaks and valleys into the training effort. A ship that is deployed on extended operations with the captive audience removed from home port can take full advantage of generous periods of at-sea time to effectively pursue operational and maintenance on-the-job training. The transit times and lengthy routine steaming periods on station associated with deployed periods work in support of OJT as opposed to the short term, dynamic commitments noted earlier in the home port scenario. The end of a major deployment historically sees the state of training of a ship's crew at its highest. During a regular overhaul or other non-deployed periods when underway time is limited or non-existent and competing demands are placed on the unit, the state of training suffers.

(3) Too often the operating unit is not an effective training setting and the productiveness of OJT suffers. Training programs in place must take into account the unique factors prevalent in the working environment, particularly the surface and sub-surface environment. As a general rule, the classroom setting of a shore-based course of instruction can not be replicated in a ship, and the classroom instructional techniques and materials may be totally unsuitable for shipboard application. The capability of ships to absorb additional training programs must be carefully considered and the program that was designed to aid them must not create more work for them. A training system placed in the operational setting must not exclude the ship's capability to maintain additional training hardware, provide administrative support, and provide areas conducive to instruction and

individual study. Additionally, the system must not require trainers with sophisticated operational skills and maintenance capabilities who are simply not available in the ships.

ONGOING PROGRAMS/ALTERNATIVE STRATEGIES FOR SOLVING OR ALLEVIATING THE PROBLEMS

1. PQS/PMS. The Personnel Qualification Standards Program and the Planned Maintenance System are the operational and maintenance OJT road maps for operating units. These ongoing programs are inherently sound and provide within each unit a standardized approach to OJT which serves to minimize the effects of all problems noted.

(a) PQS. Increased attention is being focused on PQS, and the program is being expanded and refined. During the past year PQS coverage for aviation units has expanded dramatically. Within the standardized surface Type Commander Training Manuals watch station PQS is accorded the number one priority in the unit training program. PQS receives equal emphasis in the formal schools. The schoolhouse is represented each time a standard is developed and students can be "signed off" in the systems and theory portion of a standard in shore-based schools prior to reporting to their operating unit. New PQS Manager's Guides have been promulgated for both surface and aviation units to assist them in managing PQS as part of the unit's overall training program. Additionally, a PQS Model Manager's Guide is now available to new construction and prototype systems managers to aid them in ensuring the availability of PQS prior to delivery of their platform or system. PQS Study Guides are being developed to assist both the unit in streamlining its program management efforts and the individual in pursuing his qualifications. The standards themselves are undergoing continuing refinement. Since many tasks and procedures are common among different types of ships, a common/unique (two-volume) PQS concept was developed. Fundamentals and systems common to many ships are covered in a "common" volume, while each ship class has another volume which addresses all the unique requirements of that class. Additionally, a common/unique "Leveled" concept has been introduced into the surface engineering community which provided for division of the standard into entry level, operator level and supervisor level categories of difficulty. A substantial amount of maintenance technician PQS is being developed within the aviation community. PQS development for surface units emphasizes operator watchstation PQS, but those maintenance actions that an operator must take as a part of his watchstation duties are addressed in the standard. When additional resources are available, the need for development of separate surface maintenance technician PQS will be reassessed.

(b) PMS. The Planned Maintenance System has been in place since 1963 to provide each ship department and supervisor with the tools to plan, schedule, and control planned maintenance effectively. PMS, although standard in concept and procedures, is flexible enough to be adjusted by the ship to be compatible with operational and other type schedules. Continuous refinement to PMS is facilitated through a structured feedback system from operating units. Each unit's PMS accomplishment rate is closely monitored by means of regularly scheduled inspections. Within surface and submarine units, the PMS Spot Check Program is heavily employed. This involves frequent observation and critique of preventive maintenance actions by the Commanding Officer, Executive Officer or Department Head.

2. Ongoing Strategies to offset lack of supervisory talent.

(a) Pipeline Training Modifications. Given the petty officer numbers deficit that does not lend itself to near term solution, and the shortfall of quality supervisors, the focus is on shore-based schools, particularly enroute pipelines, to determine where selective revisions or major modifications will help alleviate the on-board problems. Recognizing that the current training approach is generally characterized by heavy front-end loading, efforts are being directed toward narrowing the training target. Alterations to technical training pipelines are being addressed to provide lower rated personnel with only that amount of front-end training they need to perform effectively in their initial assigments, and to place them in their units as useable assets in a shorter period of time. In the case of a relatively new rating like the gas turbine technician (GS), the engineering training pipeline is being modified to a three tier approach: operator level training, maintenance system technician training at a later date as a reenlistment incentive, then senior system technician training as a further reenlistment incentive. Up to this point,all GS training was entirely front-end loaded. This latter approach may well have application with regard to other technical ratings that are experiencing a numerical shortfall similar to the GS rating. The completely front-end loaded approach tends to initially overtrain our people and offers them no advanced training later in their enlistment. In critical rating areas, this approach tends to be self-defeating, as these highly-trained people are prime candidates for private industry when they conclude their initial enlistment.

(b) Increased hands on maintenance training. Increased hands-on maintenance and operator training in formal schools is being stressed. As an example, the existence of an operational steam propulsion hot plant at Great Lakes replicating the FF-1052 class propulsion plant offers both officer and enlisted personnel valuable hands-on training in an actual propulsion plant setting, and an opportunity to start their qualification process prior to reporting to their units. Following "A" School and an Advanced Operator Course, six-year obligor boiler technicians are given an intense advanced maintenance course prior to reporting to their first operating unit. Again within the surface engineering arena, the existence of specific modules of instruction in the Boiler Technician/Machinist Mate Advanced Maintenance Training Course at Fleet Training Centers in Norfolk and San Diego, allows unit commanders to input personnel where maintenance training is really needed. The entire Advanced Maintenance Training Course serves as a primary reenlistment incentive for six-year obligor personnel.

3. Ongoing Strategies to offset operational environment constraints.

(a) Use of simulators. Training utilizing simulators offers numerous benefits. Acquisition and operating costs are minimized by a trainer. It does not expend fuel and does not tie up operational equipment. Realistic hands-on training can be provided for casualty situations with no risk of equipment damage or personnel injury. Student proficiency and skills can be assured. Training exercises can be repeated quickly and easily under direct supervision. Student performance can be evaluated and graded easily by recording system operation and re-running problems for demonstration and critique. Full crews can be trained if the trainer has a fully integrated mode of operation. Aviation flight simulators have been utilized for a number of years. Within the surface community, the 1200 PSI Propulsion Plant Trainer, Device 19E22, at Surface Warfare Officers School, Newport, Rhode Island, provides a realistic, real time simulation of the Fireroom, Engine Room, Auxiliary Machinery Rooms, and Electrical Central of the FF-1078 class frigate. Equipment and systems are functionally simulated to train personnel in startup, normal operation, shutdown, and casualty control of the propulsion plant. Since March 1979, nearly 14,000 student hours of fleet utilization training have been conducted in the propulsion plant trainer. This is in addition to its primary utilization by officers undergoing training at Surface Warfare Officers School. The requirement

for two additional trainers of this type at Fleet Training Centers, Norfolk and San Diego, has been validated, and will be a POM-83 submission. The only drawback to the propulsion plant simulator, is that it basically provides operator individual and team training, but little maintenance training.

(b) Operational hot plants. As previously noted, an operational steam propulsion hot plant is on-line at Great Lakes, replicating the FF-1052 frigate class propulsion plant. This facility has been in operation for eight years and offers officers and enlisted engineering personnel enroute to shipboard duty valuable hands-on training in an actual propulsion plant setting. FF-1052/1078 class ships exist in substantial numbers in both Atlantic and Pacific Fleets, and the high pressure propulsion plant (1200 PSI) is found in a large percentage of active fleet units. Training in an actual propulsion plant represents the only way that vitally needed maintenance training is provided. Additionally, a 600 PSI propulsion plant hot plant has been on line at Great Lakes for almost twenty years. It still serves as the primary means of providing basic hands-on maintenance training for approximately 2,500 nuclear machinist mates each year. This obsolete plant will be phased out in three years to make way for modern propulsion part task trainers as part of a revised boiler technician/machinist mate accession training system. With the introduction of considerable numbers of DD-963 and FFG-7 ships with gas turbine propulsion plants, the requirement for a gas turbine propulsion hot plant has been validated. Efforts are ongoing to contract for a FFG-7 hot plant to be ready for training in 1983 and a DD-963 hot plant will be programmed in the out years.

(c) Fast cruises. With limited productive training time a fact of life, particularly when a unit is operating from its home port, it is essential that no training opportunity be missed. Within the surface community, conduct of a fast cruise offers an excellent non-underway training opportunity. The term derives from the ship remaining fast to the pier during the exercise, while steaming its propulsion plant and operating all systems as if the ship were in the underway mode. All shipboard departments can pursue effective OJT during the day "at sea."

(d) Mobile Training Teams. To provide intense periods of training in specialized shipboard areas, the Mobile Training Teams concept is receiving increased attention. These teams are comprised of experts in their field who spend a

designated period in a ship training the ship's teams in correct operating procedures. Mobile Training Teams are active in both Atlantic and Pacific Fleets to provide training in engineering watchstation and casualty control, naval tactical data systems operation, and special weapons handling. Maintenance assist visits are available from Mobile Technical Units which function on the Naval Sea Systems Command's technical agent staff on both East and West Coasts.

(e) Mobile Training Vans/SORATS/ORATS. Numerous mobile training vans are available to be placed alongside the ship and "plugged in" to the ship's system for specialized training. The 20B4 is a pierside combat system trainer providing anti-air warfare/airborne early warning training. The 15F11 is an electronic warfare on board training package, which through the use of tapes and slides provides threat recognition training. The L-TRAN training package provides basic naval tactical data system operation training. The AEGIS system installed in the CG-47 class ship (new construction) will have its own on board training package. Submarine Operational Readiness and Assessment Training (SORATS) and similar training in the surface community (ORAT) are recent innovative approaches to upgrade OJT in tactical systems (Sonar/Fire control). These are contractor-developed exercises with an Exercise Controller provided to exercise individuals or teams.

4. Alternative strategies/pilot efforts to address all problems.

(a) Job Performance Aids (JPA). To address the problems of increasing unit training costs, declining entry level skills, unfavorable attrition and personnel dissatisfaction, the Navy Personnel Research and Development Center has been embarked on a Performance Aids Test and Evaluation Project for the past two years. The approach taken on this project is based on the premise that current Navy personnel problems can best be addressed through a total systems approach. An Integrated Personnel Systems Approach (IPSA) was designed which is based on joint consideration of training design, job performance aid design, job design, career structures, advancement channels, incentives, and the quality and quantity of personnel resources available. Coupled with a cost tradeoff model, IPSA is being employed to evolve a new personnel system concept entitled Enlisted Personnel Individualized Career System (EPICS). EPICS features use of job performance aids and deferred formal training transition

adaptation training. Deferred training is an innovation in which the recruit is first sent to sea for a shipboard orientation period of six to eight months and then is returned for shorebased technical training depending upon his level of adaptation to the shipboard environment during his indoctrination period. A job performance aid is any information-based device, document, or guide used on the job to aid performance and/or avoid costs where learning is incidental. Examples would be a pilot check list, a hand held computer, or a maintenance requirement card. Job performance aids would be used to meet initial job requirements, and further training investment would be conditional upon the degree of individual shipboard adaptation and demonstrated interest and performance. The EPICS concept with fully integrated JPA technology is being tested in the fleet using the NATO Seasparrow Surface Missile System as the test vehicle.

(b) Shipboard Propulsion Plant Operator Training Project (SPPOT). This Navy Personnel Research and Development Center project is directed toward development of a shipboard training system that considers the potential impact of proposed training programs on the total shipboard environment. SPPOT addresses itself to the previously noted problem of ensuring that a training system developed for shipboard use will actually work in the afloat environment. The outcome of the pilot effort on board USS CONSTELLATION (CV-64) will be a model for conducting main propulsion training. SPPOT products produced include OJT procedural aids, instructor supplements, locational aids, a general orientation package, and off-line instructional packages (audiovisual presentation and watchstation workbooks). SPPOT products will be generalized to another surface ship class other than an aircraft carrier, and the system will be utilized on board USS SARATOGA (CV-60), the first carrier to enter the Service Life Extension Program (SLEP). The project will later shift to development of a training model for a different shipboard area, i.e., combat systems.

(c) On Board Maintenance Training (OBMT). This is a COMNAVSEASYSCOM-sponsored, Type Commander-managed formal OJT effort presently undergoing piloting in the Pacific Fleet surface community. The training effort uses a private contractor to provide structured technical training on selected equipments that have historically presented maintenance difficulties. Formal instruction in the working environment is given to the shipboard personnel who normally maintain the equipment and then those personnel actually

perform repairs, replacements, adjustments, etc., under contractor supervision.

(d) Shop Qualification Improvement Program (SQIP). This effort within COMNAVSEASYSCOM's Maintenance System Development Program is directed toward providing repair skill training for personnel assigned to surface ship tenders and repair ships, intermediate maintenance activities ashore, submarine tenders and intermediate maintenance activity personnel, and aircraft carrier maintenance support personnel afloat and ashore. SQIP is geared toward developing a repair skill training course and a shop procedures manual. Repair skill training in some seventeen different technical areas will be provided, including centrifugal pumps, electric motors, high pressure valves, marine boilers, air compressors, refrigeration/air conditioning, hydraulic systems, and diesel engines. To date the program has not extended beyond surface tenders, with a prototype presently in place at one ship intermediate maintenance activity ashore.

(e) Reliability-centered maintenance approach to PMS. To counter the difficulty experienced in the surface Navy in accomplishing all required preventive maintenance, a pilot effort within the Naval Sea Systems Command's Maintenance System Development Project adapting proven aircraft Reliability-Centered Maintenance (RCM) techniques is underway. RCM provides a logical, orderly, well-documented approach to planned maintenance which insures that all essential maintenance - and only essential maintenance - is accomplished. The prototype RCM installation in four FF-1052 class ships is undergoing evaluation, and indications are that preventive maintenance man hours have been substantially reduced with no apparent adverse effect on equipment performance.

ALTERNATIVE STRATEGIES: RESOURCES AND BENEFITS

1. For each of the ongoing programs and alternative strategies detailed in enclosure (2), the related costs and benefits are addresssed in this discussion. For those programs that are not already in the Service budget, the best available statement of resource requirements is presented.

a. Personnel Qualification Standards (PQS) Program.

(1) Resources. PQS is a funded program and has been level funded from $800K to $1.1M annually. This includes both the standards printing costs and the travel costs for subject matter experts to attend 2-week development workshops. In view of the increased number of surface and aviation workshops scheduled for FY-81, and most notably, the long term projected increase in aviation requirements, increased funding will be requested in POM-83 to reflect an overall annual PQS program cost of approximately $1.5M. Approximately 4,000 copies of each standard are printed, resulting in an average printing cost per standard of $3,000. Travel costs to support a typical surface workshop run $7,000-$8,000. Aviation workshops subject matter experts travel costs average $21,000.

(2) Benefits. There are approximately 550 standards on the shelf which detail qualification procedures for performing duties in a wide range of surface engineering and combat systems specialties and aircraft maintenance technician billets. It is estimated that standards are in place in approximately 75% of those surface areas where PQS is applicable. Additionally, procedures have been developed for new construction and weapons systems such that the standards will be available upon delivery to the fleet. As resources become available, selected maintenance technician PQS for surface units will be developed. Maintenance technician PQS has been the main thrust of the aviation PQS development effort. With regard to the higher cost of aviation development workshops, it should be noted that multiple standards are developed in these particular workshops. The H-1 helicopter maintenance workshop held November 1980 resulted in nine new standards. Revised workshop procedures are being studied to reduce costs. Revision in the format of PQS has been adopted to minimize the impact of escalating printing costs. The PQS program has significant Navy-wide impact for each dollar spent.

b. Planned Maintenance System (PMS).

(1) Resources. PMS is a funded program within the overall Ship's Maintenance and Material Management System. PMS for in-place systems is funded at a level of $9-10M annually. This includes funding for a PMS reduction effort involving review of all Maintenance Requirement Cards that started in FY-79 and will conclude in FY-81. This does not include the previously discussed Reliability Centered Maintenance pilot effort.

(2) Benefits. The major benefit of PMS is that it provides each user with a standard means for planning, scheduling, controlling and performing planned maintenance of all equipment. It is completely in place in surface ships, has its aviation counterpart in the Naval Aviation Maintenance Program, and with noted exceptions, is installed in the submarine force. Since PMS maintenance actions are the minimum required to maintain the equipment in a fully operable condition within specifications, effective pursuit of PMS tends to reduce downstream OJT maintenance requirements. The Fleet feedback portion of PMS has beneficial efforts in terms of identifying and minimizing later OJT maintenance requirements, realizing more effective spare parts support, and minimizing later OJT maintenance repair actions. Whenever a casualty occurs to a major shipboard system or equipment, the casualty report must identify if PMS coverage for the affected equipment is adequate and whether it had been performed as specified.

c. Use of simulators.

(1) Resources. The 1200 PSI propulsion plant simulator, device 19E22, at Surface Warfare Officers School Command, Newport, Rhode Island, has been on line since January 1978. Initial procurement cost was approximately $10M. Roughly $500K has been expended to date to accomplish numerous technical equipment change requests to ensure that the simulator is fully supported as if it were a live FF-1078 class propulsion plant. Annual O&M and MPN costs are approximately $225K, broken down as follows:

-- Operation: $8,000 (electricity)
-- Maintenance: $37,000 (building repair, building maintenance, repair parts)
-- MPN cost: $171,000 (instructor and support personnel)

Fleet commanders' stated requirements for additional simulators are presently unfunded. A POM-83 submission will request $16.8M for a 19E22 device at Fleet Training Center, San Diego, in FY-84 and $12.1M for a similar device at FTC, Norfolk in FY-85.

(2) Benefits. Since June 1979, the 19E22 at SWOSCOLCOM has been on a double shift operation to accommodate a heavy officer training load (SWOSCOLCOM is the focal point for all surface officer propulsion training) along with an increasingly heavy usage by fleet personnel. Training in the simulator is particularly beneficial to fleet engineers during regular overhaul periods when they are unable to train in the actual propulsion plant. Additionally, the simulator is invaluable for intensive team training workups for major at-sea periods or scheduled examinations. There are other very significant benefits gained from simulation:

-- There are no fuel costs.
-- Training is gained without risk of damage to actual equipment or injury to personnel.
-- Training can be repeated quickly and easily.
-- The simulator can be placed in operation by one man.

The most notable drawback to the simulator as a training medium is that it is not ship specific, is somewhat lacking in plant realism, and offers only operator training.

d. Operational propulsion hot plants.

(1) Resources. An operational 1200 PSI propulsion hot plant has been in operation at Great Lakes since 1972. The 600 PSI propulsion hot plant came on line in 1962. O&M costs for the respective hot plants for the fiscal year just concluded were:

	1200 PSI Hot Plant	600 PSI Hot Plant
OPS:	$900K	$400K
MAINT:	$300K	$100K
TOTAL:	$1.2M	$500K

The obsolete 600 PSI hot plant will be phased out by 1983 and replaced with modern boiler front and throttleman part task trainers at a total estimated cost of $3M. With a projected fleet inventory indicating nearly half the ships will be gas turbine powered by the mid-80's, the requirement for an

operational gas turbine hot plant has been validated. Actual acquisition costs are still subject to negotiation. With a contract to be let shortly, the scheduled Ready for Training date for a FFG-7 class propulsion hot plant is April 1983.

(2) Benefits. The biggest single advantage of hot plants is that they provide valuable hands-on training in an actual propulsion plant setting. This includes both operator and maintenance training. Maintenance OJT in the operating unit is eased because of the hot plant exposure personnel obtain while enroute to their assigned units. It should be emphasized that hot plant training is available to all officer and enlisted personnel enroute to surface engineering assignments, including senior officers attending the Senior Officer Ship Material Readiness Course.

e. Mobile training vans/ORATS/SORATS.

(1) Resources. Four 20B4 Pierside Combat Systems Trainers are funded at $2M per van. These provide surface warfare team training in anti-air warfare and airborne early warning. A 20B5 pierside trainer for the OLIVER HAZARD PERRY (FFG-7) class is presently in research and development. These vans, which will provide total multi-threat training, will cost $10M per copy. The 15F11 electronic warfare on board training package is available to the fleet for threat recognition training. Training in basic shipboard naval tactical data system operations is available through the Lesson Translating (L-TRAN) system. The CG-47 class cruiser will join the fleet with a complete on board training package installed to provide organic training in the AEGIS combat system. Submarine Operational Readiness and Assessment Training (SORATS) and its surface counterpart (ORATS) have been mentioned previously. They are contractor-developed exercises with an exercise controller that can be run in the operating unit to provide individual or team training. ORATS for anti-submarine warfare training is available now; AAW ORATS is in research and development.

(2) Benefits. The use of portable plug-in trainers has increased significantly in the surface combat systems area, and the benefits are many. Personnel can train on their own equipment and simulate an actual threat environment while alongside the pier. The entire team can train together. Training can be immediately assessed and repeated rapidly. This, however, provides operator OJT only.

f. Shipboard Propulsion Plant Operator Trainer Project (SPPOT).

(1) Resources. The SPPOT program, described in enclosure (2), provides for three levels of implementation of developed products: (a) propulsion products for the pilot aircraft carrier and additional carriers; (b) generalization of the propulsion products to a FF-1052 class frigate; (c) implementation on all 1200 PSI propulsion plant ships. Preliminary estimates of the front end implementation costs are as follows:

- Training program for first ship:	$500K
- Training program for five additional aircraft carriers:	$600K
- Training program to generalize materials to first frigate:	$140K
- Training program to place materials in 190 1200 PSI ships @$60K each:	$11.4M
- Total cost of implementation (all 1200 PSI ships):	$12.6M
- Total cost of program management and materials update (10 years):	$ 1.75M
- Total cost of program for first 10 years:	$14.4M

Inasmuch as an in-house effort is being organized to generalize the training products to the FF-1052 class, it is anticipated that these projected front end implementation costs will be significantly reduced.

(2) Benefits. Substantial payoff from SPPOT is envisioned as follows:

- The program will thoroughly integrate with PQS and the Engineering Operational Sequencing System (approved propulsion plant operating procedures for each ship) and will provide a means to train to these in place ship programs.

- The program will be tailored for use in the shipboard environment precluding the need for sophisticated management techniques to maintain it.

- SPPOT will enable relatively inexperienced journeymen to function as competent instructors by providing them detailed instructor guides and supportive training materials.

- Aircraft carriers (@$400K per year x 10 years x 6 carriers):	$ 24M
- Other surface ships (@$150K per year x 10 years x 190 ships):	$285M
- Total Savings:	$309M
- Net savings for 10 years ($309M - $14.4M)	$294.6M

g. On Board Maintenance Training.

(1) Resources. The On Board Maintenance Training Program has been expanded to a pilot effort in the Atlantic Fleet to match that underway on the West Coast. The following shipboard equipments are included within the pilot effort: centrifugal pumps, valves/regulators, air compressors, air conditioning/refrigeration, motors/controllers. Funding for this effort within COMNAVSEASYSCOM's Ship Support Improvement Project is projected at $3.5M in FY-81 ($1.0M in FY-80). The average program cost per man week of training provided has been $526.

(2) Benefits. The obvious benefits of on board maintenance training are an improvement in maintenance self-sufficiency capability at the organizational level, and a reduction in costly rework by organizational level maintenance personnel. Shipboard personnel work on their own equipment; and as a result of the formal maintenance training period, needed repairs are accomplished.

h. Ship Qualification Improvement Program (SQIP).

(1) Resources. O&MN program costs for SQIP in FY-79 were $4.3M. FY-80 costs were $5.5M. Some 42,000 man weeks of repair skills training have been provided to date at an average SQIP cost of $300 per man week.

(2) Benefits.

- Training is focused on shop/work center personnel responsible for performing the work.

- Shop/work center facilities are upgraded and re-equipped in conjunction with training.

- Ship repair work is performed in conjunction with training.

- Test scores before and after training document significant improvement.

- SQIP is an excellent vehicle for moving new repair technology into the fleet.

i. Reliability-centered maintenance approach to PMS.

An RCM Evaluation Plan calls for an evaluation of four FF-1052 class ships using RCM for 38 systems to be matched against four sister ships using conventional PMS. A reduction of 43% in planned maintenance manhours requirements in the prototype installation in USS ROARK was noted, with no availability problems identified. This represented a savings of 32,000 manhours per year. A related analysis is devoted to development of a new requirements determination logic, based on RCM principles in overhaul requirements determination. This was applied to the USS WADDELL (DDG-24) regular overhaul, with a resultant 20% savings in mandays in the repair portion of the overhaul. Based on the results of the USS WADDELL effort, the RCM decision logic approach is being tested in the overhaul planning of the USS RICHARD E. BYRD (DDG-23), scheduled to commence in late 1980. If this test is successful, the RCM based repair work decision logic can be institutionalized in future overhaul planning. A savings of 10% can conservatively be assumed in surface ship overhaul costs which annually cost $1B.

2. Other strategies discussed in enclosure (2) are either no-cost alternatives such as fast cruises or utilization of Mobile Training Teams, or are pilot efforts not yet firm enough for a statement of well-defined resource requirements, such as Job Performance Aids Technology within the Enlisted Personnel Individualized Career System (EPICS).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Current Navy OJT programs are inherently good. The Personnel Qualification Standards program and the Planned Maintenance System provide a sound baseline approach to OJT within operating units. These ongoing programs, if effectively executed, tend to minimize the effects of numerous problems impacting on overall OJT effectiveness. A severe manning shortfall is the most serious of these problems, most notably the lack of sufficient numbers of supervisory personnel. Severe degradations in OJT programs are being experienced now, and will continue in the absence of qualified people to manage the programs. Given the constraints in the manning environment, lack of standardization with regard to management and execution of Navy OJT programs makes the task of realizing an increase in OJT effectiveness more difficult. Specific guidelines for the conduct of technical OJT need to be addressed similar to those in place for the General Military Training Program.

2. The manning situation will not lend itself to near term resolution. This suggests a balanced approach towards selecting affordable strategies that will provide a positive assist to the experienced supervisors we do have in successfully meeting their OJT responsibilities in the conventional setting, while complementing their efforts through carefully selected formal OJT or contractor-assisted OJT initiatives. The supervisor can use some additional tools to effectively manage his programs. Training systems or training packages designed for use in the operating unit must be developed with the constraints of the working environment considered, such that they can be administered at the unit level without the need for highly qualified supervisors or sophisticated management techniques. The operating unit, particularly a Navy ship, is an excellent medium for on the job training. However, the systems and equipments within the unit are not always available for OJT. Replicating these in an OJT hands-on environment in close proximity to the unit and also in formal schools that provide enroute training offers considerable promise. Simulators in areas of fleet concentration and availability of operational hot plants for officer and enlisted personnel enroute to their units provide this sort of hands-on environment. Increased opportunities for hands-on training must be stressed within the operating unit in an effort to home grow supervisory talent. This should occur both at the front end, through the use of deferred initial

schools training and Job Performance Aid technology and later through fleet input to hands-on maintenance training shore-based schools on the waterfront aimed at upgrading supervisory level maintenance skills.

3. Navy OJT is very operator oriented and operator on-the-job training is generally sound. The PQS program provides an excellent road map for accommodating operator OJT. To some extent in the surface community and to a large degree within aviation units, maintenance OJT is fostered through judicious execution of the PQS program. Conventional operator OJT is significantly complemented through the use of mobile training vans, mobile training teams, carefully-tailored surface and submarine exercise packages, and Fast cruises. The Shipboard Propulsion Plant Operator Training program (SPPOT), integrated with PQS, is an operator-oriented effort designed to train shipboard engineers to become qualified watchstanders such that they will be able to operate their propulsion plant correctly and safely in accordance with approved operating procedures. SPPOT offers the additional promise of developing a model for a training system geared to the shipboard environment that can be employed in other ship areas, i.e., operations and weapons. Effective operator OJT obviously has a positive effect on downstream maintenance requirements, however, separate emphasis must be applied to specifically address upgrading maintenance OJT.

4. The identification of OJT requirements, particularly those which must be addressed in the operating unit, and the follow-up action suggested by this identification process, should be accorded increased attention. In the first phase of curriculum development utilizing the Instructional System Development process, a Job Task Inventory is generated, detailing those skills that must be taught along with the appropriate instructional setting to be used. Resource constraints dictate that some of these skills cannot be accommodated within the course curriculum. Either the unit OJT program must pick-up on these specific skills or an on board training package must be developed for delivery to the unit to focus on those skills that fall below the Job Task Inventory cut line.

Recommendations

1. That expansion and refinement efforts with regard to the Personnel Qualifications Standards program and the Planned Maintenance System go forward expeditiously, to include a reassessment of the need for surface maintenance technician

PQS and a greater application of the Reliability Centered Maintenance approach in PMS.

2. That the overall requirements for the General Military Training Program be reviewed at the sponsor level with a view toward further streamlining of the program to minimize the training time conflict with technical OJT.

3. That strong support be accorded to those on-going initiatives designed to upgrade organizational level maintenance capability: On Board Maintenance Training, Shop Qualification Improvement Program, and increased hands-on maintenance training in formal schools.

4. That the Shipboard Propulsion Plant Operator Training Project (SPPOT) be closely evaluated for its potential in identifying the model of a training system that will work in the shipboard environment.

5. That increased attention be focused on the identification of requirements for on-the-job training that must be addressed in the operating unit, and that a concerted effort be applied towards applying the resources necessary to satisfy these requirements.

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

IN REPLY REFER TO
TRI25-plc
3 DEC 1980

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE, MANPOWER, RESERVE AFFAIRS AND LOGISTICS (PROGRAM MANAGEMENT)

Subj: On-the-Job Training Study Task

Ref: (a) Memo from ASD, MRA&L(PM) of 60ct80

Encl: (1) Phase IV, On-the-Job Training Study Task

1. The reference requested that all services synthesize their previous submissions which have contributed to this study. Additionally, each service was to provide those conclusions and recommendations considered appropriate for the addressal of deficiencies in their OJT programs for maintenance.

2. The enclosure is provided in response to the reference.

A. A. SARKO
Brigadier General, U. S. Marine Corps
Director of Training

CHAPTER I

DESCRIPTIONS AND EVALUATIONS

OF

CURRENT OJT PROGRAMS

GENERAL. Chapter I is a concise description of those programs which the Marine Corps employs to reinforce formal school training. Field Skill Training, managed on-the-job training and on-the-job training are designed to provide Marines with the additional skills required for satisfactory performance. TAB A expands upon the abbreviated discussion presented herein.

FIELD SKILL TRAINING (FST)

DESCRIPTION: Training conducted by designated Fleet Marine Force commands subject to the Commandant of the Marine Corps' approved performance objectives and training time restrictions.

PURPOSE: FST accepts students at the entry-level and qualifies them in a primary MOS within a specific period of time.

METHODS OF DETERMINING TASKS TO BE TAUGHT

- Occupational analysis by subject matter experts.
- Task analysis.

METHODS OF INSTRUCTION

- Lecture
- Demonstration
- Programmed instruction
- Performance

MEANS OF IDENTIFYING AND/OR DOCUMENTING PROGRESS

- Internal
  - -- Test results
  - -- Student evaluation of instruction
  - -- Instructor evaluations of instruction
- External
  - -- Graduate surveys
  - -- Supervisor surveys

IDENTIFICATION OF PROBLEMS THAT INTERFERE

- Limited time

- Personnel instability

- Lack of instructional expertise

- Limited budget

EXTENT AND SERIOUSNESS OF PROBLEMS

- Limited Budgets

-- EXTENT - Budgetary constraints have a definite effect throughout the Marine Corps on the quality of the FST graduate.

-- SERIOUSNESS - Critical impact.

- Limited Time

-- EXTENT - All FST programs have time constraints imposed.

-- SERIOUSNESS - Moderate impact.

- Lack of Instructional Expertise

-- EXTENT - The Marine Corps utilizes subject matter experts as instructors, a great majority of which are not trained in current instructional methodology.

-- SERIOUSNESS - Moderate impact.

- Personnel Instability

-- EXTENT - School management and instructional personnel are subject to continual reassignment for personal reasons and professional career enhancement, however this situation is being addressed.

-- SERIOUSNESS - Moderate impact.

MANAGED ON-THE-JOB TRAINING (MOJT)

DESCRIPTION: MOJT is training conducted by designated commands, governed by the Commandant of the Marine Corps' approved programs of instruction. MOJT combines formalized instruction and practical application in an actual job situation.

PURPOSE: MOJT qualifies students in an MOS within a working vice academic environment.

METHODS OF DETERMINING TASKS TO BE TAUGHT

- Occupational analysis by subject matter experts.
- Tasks analysis.

METHODS OF INSTRUCTION

- Lecture
- Demonstration
- Performance
- Illustrative problem
- Tutoring

MEANS OF IDENTIFYING AND/OR DOCUMENTING PROGRESS

- Test results
- Supervisor's observations
- Job performance evaluation

IDENTIFICATION OF PROBLEMS THAT INTERFERE

- Lack of supervisory personnel
- Non-standard training
- Lack of training resources
- Limited time
- Limited budgets

EXTENT AND SERIOUSNESS OF PROBLEMS

- Lack of supervisory personnel

-- EXTENT - A majority of Marine commands do not have the supervisory personnel they rate.

-- SERIOUSNESS - Critical impact.

- Limited Budgets

-- EXTENT - Budgetary constraints impact heavily on the availability of personnel and material resources.

-- SERIOUSNESS - Critical impact.

- Non-Standard Training

-- EXTENT - Supervisory emphasis and equipment availability produce MOJT graduates with variable skills.

-- SERIOUSNESS - Moderate impact.

- Lack of Training Resources

-- EXTENT - Training aids, unit's Table of Equipment (T/E), and facilities are essential elements to a successful MOJT/OJT program. These resources are limited Marine Corps-wide and are actively competed for.

-- SERIOUSNESS - Moderate impact.

- Limited Time

-- EXTENT - All MOJT programs have to be completed within a prescribed period of time.

-- SERIOUSNESS - Moderate impact.

ON-THE-JOB TRAINING (OJT)

DESCRIPTION: On-the-job training is that which employs practical application of the required skill within the working environment. OJT is not subject to specific time constraints nor a program of instruction (POI).

PURPOSE: To qualify a Marine in an MOS or improve his proficiency within an assigned MOS.

METHODS OF DETERMINING TASKS TO BE TAUGHT

- Occupational analysis by subject matter experts.
- Supervisor's determination of task priorities.
- Guidance provided by Military Occupational Specialty Manual (MOS Man).

METHODS OF INSTRUCTION

- Demonstration
- Performance
- Illustrative problem
- Tutoring

MEANS OF IDENTIFYING AND/OR DOCUMENTING PROGRAMS

- Supervisor's observations.
- Job performance evaluations.

IDENTIFICATION OF PROBLEMS THAT INTERFERE

- Personnel instability.
- Limited time.
- Lack of supervisory personnel.
- Non-standard training.
- Lack of training resources.
- Limited budget.

EXTENT AND SERIOUSNESS OF PROBLEMS

- Limited Budgets

-- EXTENT - Few FMF units conducting OJT have sufficient funding to support extensive programs.

-- SERIOUSNESS - Critical impact.

- Lack of Training Resources

-- EXTENT - A great majority of operating units conducting OJT lack sufficient materials, equipment and facilities to effectively conduct OJT.

-- SERIOUSNESS - Critical impact.

- Lack of Supervisory Personnel

-- EXTENT - Few FMF units have the number of supervisory personnel they rate.

-- SERIOUSNESS - Critical impact.

- Limited Time

-- EXTENT - OJT in operating units is often assigned a lesser priority when compared with operational commitments and equipment readiness within given time constraints.

-- SERIOUSNESS - Moderate impact.

- Non-standard Training

-- EXTENT - The Marine Corps experiences varying OJT results based on emphasis of different skills, type of unit conducting training, type of equipment authorized by the unit conducting training and other variables.

-- SERIOUSNESS - Moderate impact.

- Personnel Instability

-- EXTENT - Fleet Marine Force (FMF) units, which normally conduct OJT, traditionally experience a high turnover of personnel and a wide variety of commitments, both of which adversely affect OJT. This situation is presently being addressed and will be partially resolved in the future.

-- SERIOUSNESS - Moderate impact.

TAB A: On-the-Job Training (OJT) Study Task, 15Aug80

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

IN REPLY REFER TO
TRI-plc
15 AUG 1980

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE, MANPOWER, RESERVE AFFAIRS AND LOGISTICS (PROGRAM MANAGEMENT)

Subj: On-the-Job Training (OJT) Study Task

1. The following information pertaining to the Marine Corps "On-the-Job Training" programs is provided in accordance with the request contained in your memorandum of 31 July 1980 to the Service Secretaries.

2. Definitions. The following terms are closely related in the OJT arena:

a. Field Skill Training (FST) Program. Training conducted by designated Fleet Marine Force commands subject to the Commandant of the Marine Corps approved performance objectives and training time restrictions, for the purpose of qualifying Marines in a primary MOS. Each Marine being trained under this program is a chargeable asset and personnel input is directed and controlled by the Commandant of the Marine Corps.

b. Managed On-the-Job Training (MOJT). Training conducted by designated commands, governed by the Commandant of the Marine Corps approved programs of instruction, for the purpose of qualifying Marines for assignment of an MOS within a specified timeframe. Formalized instruction and practical application in an actual job situation are combined and the Commandant of the Marine Corps maintains quota control. All Marines to be trained under this program, except 130-day trainees, will be joined in a chargeable status by a reporting unit of the command conducting the training.

c. On-the-Job Training (OJT). Basically, practical application in an actual job situation is the means employed in this technique. The Marine learns by doing that which he/she is supposed to do in a particular specialty. Limited formal instruction is also employed, but primarily the teaching is accomplished by the set circumstances. The trainee then commences to perform the required action and corrections are made by the supervisor as required. While this technique is employed, it is done only in a limited number of situations, for a limited number of skills (which also have a small population).

TAB A

3. The majority of all initial skill training done in the Marine Corps which leads to a basic MOS is provided in the formal school setting. The training conducted as FST, MOJT, or OJT qualifies Marines in a primary MOS such as 3535 (Light Vehicle Operator). However, the Marine Corps does not use FST, MOJT, or OJT as the primary method to train any of its maintenance technicians. Once a Marine has achieved a basic MOS and is assigned to an organization for duty, his training continues. This training is often referred to as OJT but in reality is proficiency training practiced on the job. However, OJT is used to reinforce the training received in the formal schools.

4. Background Information

a. Marine Corps Order P1200.7D (MOS Manual) is the source document for identifying skills of individual Marines.

b. Marine Corps Order P1510.23B (ISD) establishes procedures for the development of instruction throughout the Marine Corps and is the cornerstone for Marine Corps training. The five phase process commencing with job analysis and terminating with training validation is foolproof--if properly followed. Job analysis is the key, whether OJT or formal school training is being considered. It provides the criterion against which training effectiveness can be measured. However, ISD is not always being done because it is very expensive in terms of manpower (possessing a certain expertise), money and time, and these resources have not been allocated.

c. The responsibility for "post entry-level training" rests with the "Commander." This includes unit schools (such as Field Skill Training (FST)), formal schools, OJT and correspondence courses. For the commander to establish a "skills" training program, he must have a means of measuring the training level of his Marines.

5. Discussion

a. Avionics Technician Training

(1) OJT in the case of avionics personnel is, in the simplest terms, practical application/evaluation leading to designation (hard skill MOS) as a qualified avionics technician. Different MOS's are assigned for specific areas within the avionics field. OJT, in reality, is a continuous process throughout the career of an avionics technician. However, only the OJT leading to hard skill designation is addressed herein.

(2) Two stages of institutional training are conducted prior to commencement of OJT. The first stage is 23 weeks of basic avionics theory, which is taught at NATTC, Memphis, TN. Graduates of this course are given a basic avionics MOS, which designates their skill level. The second stage of institutional training averages 7 weeks. Length is dependent on the complexity of the avionics system being trained on. This second stage of training is conducted in Naval Aviation Maintenance Training Detachments (NAMTRADET). NAMTRADET training is designed to familiarize personnel with specific weapons systems/equipment. Theory classes are heavily supplemented with mockups and simulators to facilitate "hands-on" training.

(3) Sixteen weeks are allotted for the second stage of institutional training and OJT. OJT is scheduled for 4 of the 16 weeks, but, again, is dependent upon the complexity of the avionics system being learned. OJT is conducted in operational units on actual avionics systems.

(4) Present problems with OJT in the avionics field, in addition to the time element, are primarily due to a lack of standardization. Set standards are not used to determine at what point OJT, as defined, is to end and designation as a qualified technician is given. This is a subjective decision made by the supervisor administering OJT. In theory, the dividing line between OJT and qualification is when close supervision is no longer required. Desired proficiency levels in required functions are in the process of being quantified in order to provide a more objective evaluation of when OJT should be terminated. The other problem area with OJT is also being rectified. In the past, trainees were assigned to a unit for OJT, but there was little guarantee that permanent assignment to that unit would follow hard skill MOS designation. This system is being revamped and trainees will be assigned for OJT to units that will receive them permanently. The quality of OJT will be greatly enhanced when the unit stands to retain the personnel they are training.

b. Engineer Equipment Maintenance

(1) Engineer equipment maintenance is generally performed by an engineer equipment mechanic. All engineer equipment mechanics must complete the Engineer Equipment Mechanics Course (approximately 11 weeks with a follow-on school of journeyman engineer equipment after first duty station) which trains the Marine to perform preventive maintenance and to repair diesel and gasoline driven equipment.

(2) OJT is used to reinforce/increase the proficiency of these mechanics on particular equipment in the unit the Marine serves.

c. Electronics Technician

(1) This discussion of OJT as it pertains to Marine Corps electronics technicians is very similar to the discussion on avionics. Different MOS's are assigned for specific areas within the electronics field.

(2) All electronics technicians must complete the basic electronics course (approximately 14 weeks) and a follow-on course(s) which trains the Marine to do a specific job on specific electronics systems/equipment.

(3) OJT is dependent upon the complexity of the electronics system/equipment being learned. However, most OJT for the electronics technician is nothing more than proficiency training on the type of equipment assigned to the unit in which the technician works.

6. Problems seen by the Marine Corps with use of OJT:

a. Personnel Instability. FMF units, which normally conduct OJT, traditionally experience a high turnover of personnel and a wide variety of commitments, both of which adversely affect OJT. Turnover and operational commitments reduce availability of both the personnel requiring training and those personnel who must provide supervision and/or instruction for those being trained. Attitudes and/or abilities of both the supervisor and trainee have to be considered. These factors tend to extend the time trainees are in OJT, while increasing the possibility that short cuts will be taken during the training cycle.

b. Limited Time. OJT in operating units is hampered by limited training time. The tempo of operations in most units determines time available for OJT with the general axiom that the faster the tempo, the less the time that can be devoted to OJT. Although an increased tempo provides for improved opportunities for OJT in that the trainees are exposed to a broader spectrum of situations, experience has shown that those opportunities usually cannot be taken for OJT. Operational commitments call for MOS proficiency and simply do not provide a practical medium for OJT. Therefore, operational commitments adversely affect OJT in terms of both personnel stability and time availability. For equipment-heavy/maintenance intensive organizations, e.g., engineer units or air control groups, there is also very limited

training time because maximum equipment readiness is in most cases the CO's number one priority. Any activity which detracts from the goal, i.e., OJT programs, is likely to be ineffective.

c. Lack of Instructional Expertise. Even in those cases where supervisory personnel are technically proficient in their MOS's, those supervisors are not likely to be familiar with current instructional methodologies and techniques. Unlike formal school instructors, who are specifically trained in the techniques of military instruction and instructional systems development, supervisors of OJT generally must train and instruct using intuitively derived programs and techniques, which, in many cases will be ineffective and certainly biased.

d. Lack of Supervisory Personnel. Few units have the number of supervisory personnel they rate. As a result, junior personnel very often fill in to train OJT trainees. While this situation helps to train supervisors, it is hardly conducive to the effective training of the untrained. Junior personnel usually do not have the variety of experience to provide the technical expertise so crucial in training technical MOS's.

e. Non-Standard Training. OJT results in varying degrees of emphasis on different skills, depending on where the OJT takes place, not only geographically but by type of unit. For example, the type mix and density of equipment in engineer units in the wing, FSSG and division are quite diverse, while mission and authorized levels of maintenance are also different. Consequently, there will be a wide range of variance in the skills possessed by individuals trained through OJT. The impact of this situation will be that a commander cannot predict with accuracy what skills and what level of proficiency Marines trained through OJT in another subordinate command will have when reporting aboard. In fact, incoming Marines trained through OJT may well be either over-trained or under-trained for that particular unit.

f. Lack of Training Materials. Technical fields are best taught with the use of training materials, e.g., audiovisual devices and system simulators. Generally the more technical the subject matter, the more training materials are in the tables of equipment of operating units. Hence, this creates the problem of an operating unit doing without sufficient training materials or attempting to obtain the materials with limited monetary and personal resources. The acquisition of training materials is not necessarily a simple matter, and if several different organizations are conducting OJT in the same

MOS, it will be difficult if not impossible to coordinate the acquisition of training materials. OJT requires the use of many items of a unit's table of equipment (T/E). Such use reduces the availability of T/E items for unit training and further affects the unit's ability to meet operational commitments. The lack of training materials may also have a carry-over effect on facilities. Operating units can generally devote only limited austere facilities to support OJT. This situation can and frequently does detract from unit training and OJT, in that both forms of training must compete for use of the same facilities.

g. Limited Budgets. OJT can be expensive if done properly. This is particularly true of technical MOS's such as engineer equipment mechanics and electrical equipment repairmen who expend considerable quantities of fuel and repair parts during their training. Few operating units have sufficient funds to support extensive OJT programs. As a result, budgetary cutbacks can and do occur to OJT. As previously mentioned, operational commitments almost always come before OJT. Therefore, if it comes down to cutting back either operational commitments or OJT, OJT is inevitably the low priority.

7. Summary

a. Although it is difficult to delineate with finality the seriousness of each of the problems cited above, it would perhaps be accurate to state that, historically, personnel instability, limited time, lack of adequate supervisory personnel, non-standard training, and limited budgets are the most serious problems. Certainly each deficiency has the potential of significantly reducing the effectiveness of OJT; hence, unit combat efficiency will eventually be directly and adversely affected.

b. The Marine Corps does not rely on OJT to train its maintenance technicians but does rely on OJT to train a limited number of skills. OJT is also used to reinforce training received at formal schools. The Marine Corps is presently working on a system to identify skills and establish tasks, standards, and conditions that will eventually apply to all occupational fields. When this system is completed, the Marine Corps will be in a position to greatly improve the overall OJT program.

F. RINEY
Colonel, U. S. Marine Corps
Deputy Director of Training

TAB A

CHAPTER II

STRATEGIES FOR SOLVING OJT PROBLEMS

GENERAL. The problems enumerated in Chapter 1 are not specifically limited to the OJT maintenance program. They are problems which impact on numerous areas with varying severity. Accordingly, the alternative solutions presented herein address system deficiencies, the correction of which will eventually improve the OJT program for all MOS's.

ALTERNATIVE 1 - Expansion of Instructional Systems Development (ISD)

DISCUSSION:

- Instructional Systems Development involves designing the training curriculum to meet clearly defined requirements, utilizing the optimal media and methodology in presenting the material and a continuing effort to refine and enhance future training based on student performance.

- The Marine Corps has embarked on an extensive review and reorganization of its training programs and requirements. Central to the review's success will be its addressal of ISD. The following are initial actions and/or recommendations being undertaken/considered for improvement of the ISD system and therein advancing the efforts to reduce the utilization of OJT as much as possible.

-- Incorporation of instruction in the ISD process in all Professional Military Education (PME) settings.

-- Establishment of a training occupational speciality for career NCO's and officers.

-- Task analysis of all Military Occupational Specialties (MOS's).

-- Provide mandatory ISD instruction for senior training management personnel.

-- Increase the number of personnel assigned to the Marine Corps Instructional Management School to facilitate active implementation of ISD.

ALTERNATIVE 2 - Training Situation Analyses (TSA's) and Task Analyses (TA's)

DISCUSSION:

- The Naval Training Equipment Center (NTEC) Orlando, Florida has the capability to perform or contract for the conduct of Training Situation Analyses (TSA) and Task Analyses (TA). A TSA is essentially a broad spectrum review and analysis of the existing training situation within an organization. The product of a TSA is a document which provides recommended

solutions to training problems by employing the systems approach to training. A TA is a more specific and a detailed outgrowth of a TSA. TSA's and TA's could result in the following applications.

-- Detailed plans for designing new training facilities.

-- Plans for redesigning existing training facilities.

-- Proposals for streamlining training management.

-- Recommendations for improving media and instructional methodology.

-- Task analysis of any occupational speciality resulting in improved instruction or training.

- The Marine Corps is sponsoring a pilot program being conducted by NTEC. Entitled the Intern Program; university graduate-level, student interns are performing an ISD analysis and design of courseware for two engineering MOS's at Camp Lejeune, NC. The program employs the team concept utilizing five interns, Marine technical assistants, experienced NTEC analysts and one university project coordinator. Upon implementation, the results of the teams' efforts should greatly enhance the engineer maintenance program.

ALTERNATIVE 3 - Individual Skill Qualification Training Systems (ISQTS)

DISCUSSION: At the end of CY80, the Marine Corps will have implemented a new system specifically designed to provide for the identification of individual training requirements for Marines, both by grade and MOS. The Infantry Occupational Field (OF-03), which is the largest occupational field in the Marine Corps, is the first OF to be completed. A major effort will then be undertaken to incorporate 5 additional OF's to include those in the maintenance area into ISQTS commencing in CY 81.

- When fully implemented ISQTS will provide the following:

-- The means to determine the optimal student population (number and level).

-- The appropriate location for training.

-- A precise description of expected student performance under specified conditions with acceptable standards.

-- The type of training support required for each individual training objective by MOS to include Class V and Extension School requirements.

- This system will also be dovetailed with the Marine Corps Combat Readiness Evaluation System (MCCRES) and the new Training Readiness and Cost Evaluation System (TRACES). In summary, the new training management systems envisioned for the Marine Corps during the next fiscal year will not only provide the Corps with the capability of identifying the individual and collective training requirements but also the ability to isolate costs involved in accomplishing this training.

ALTERNATIVE 4 - Skill Performance Aids (SPA)

DISCUSSION: The Marine Corps is investigating the feasibility of adopting the Army's Skill Performance Aids (SPAs). A SPA is a self-contained training extension package designed for a specific item of equipment. It provides a step-by-step guide for accomplishing all skill requirements for a given piece of equipment at a specific echelon of maintenance. SPAs are produced in several different formats including audiovisual, printed and audio-only. The benefits of the SPAs concept are many fold. More usable TM's will free NCO's from having to supervise every detail in the maintenance program. A pre-planned OJT program comes to the unit with the new piece of equipment, and frees the NCO from first having to figure out how to maintain the equipment, and then having to develop a similar program. This program lets the individual learn at his own rate and allows him to review material he in unsure of whenever he needs to, without making his supervisor formally instruct him. The extension training materials and the technical manuals are complementary and are most effective when used together.

ALTERNATIVE 5 - Training Extension Courses (TEC) and Technical Manuals (TM)

DISCUSSION:

- Marine Corps Institute (MCI) provides correspondence courses within all MOS's as a source of professional improvement. MCI will, in the near future, offer MCI credit for courses developed in the Training Extension Course (TEC) format. In this new approach to correspondence course instruction, a student, or group of students, will enroll in the TEC course as any Marines would in a traditional MCI course. At this point, the student(s) would contact the Training and Audiovisual Support Center (TAVSC) and arrange to take the series of audio/visual TEC lessons required by the course. When the MCI receives the enrollment application, a review lesson and some additional study material will be mailed to the student. Mandated group enrollments in the TEC mode would serve to provide a common base for OJT maintenance skills. The TEC mode would also take advantage of a more interesting training media and would not burden supervisors with additional instructional tasks.

- The importance of technical manuals (TM's) as a training medium can not be overlooked particularly in the OJT program. The Marine Corps recognizes the requirement to place increased emphasis on those areas of TM's dealing with theory of operation and maintenance procedures and therein develop TM's as a training medium.

ALTERNATIVE 6 - Computer Based Education (CBE) and Automated Test Equipment (ATE)

DISCUSSION:

- The Marine Corps Communication Electronics Schools (MCCES), Marine Corps Air Ground Combat Center, Twentynine Palms, California is developing a computer-based education (CBE) system. This system will ultimately provide computer managed instruction (CMI) featuring all courses taught at MCCES to include communications equipment maintenance courses. CMI is being considered for possible "exportation" to other Marine Corps schools. When combined with computer assisted instruction (CAI), the system will enable the Marine Corps to realize the sizeable potential savings made possible by individualized self-paced instruction and enable the school complex to provide better training in a more timely manner while utilizing fewer training personnel. CBE will eventually result in a reduction of OJT in the communication maintenance field.

- Automated Test Equipment (ATE) is presently in use and designed to assist in troubleshooting/repair of electronic equipment. The Marine Corps is investigating the expansion of ATE as a training medium through the purchase of training cassettes on specific equipment items thus improving OJT for electronic technicians. Additionally the amount and complexity of technician training required will be substantially reduced when system performance monitoring devices are designed into future generation electronic equipment. This concept referred to as Fault Isolation Diagnostics (FID) reduces the amount of maintenance personnel and time required to support equipment/systems maintenance.

ALTERNATIVE 7 - Lessening Excessive Competing Training Requirements

DISCUSSION

- To properly conduct OJT, adequate time must be allocated however excessive competing training requirements serve to limit the amount of time available. Further discussion on the subject follows:

-- Marine Corps training managers at all levels are concerned with the great difficulty they encounter in attempting to satisfy training requirements which often appear redundant, excessive, and without obvious purpose. Experience has shown that sufficient resources (time, money, personnel, and facilities) are not always available to accomplish the training required. Since all required training cannot be accomplished, a strong sense of frustration exists among the trainers and "selective disobedience of orders" comes into play.

- In an effort to alleviate excessive training requirements, the confusion surrounding training priorities and make more time for necessary training, the Marine Corps intends to publish a single source document which will:

-- Clearly articulate Marine Corps training philosophy.

-- Provide a matrix of all mandated training requirements which will be updated at least annually.

-- All training requirements will be coordinated with the Director of Training, HQMC prior to approval and publication.

-- All training requirements levied by HQMC are to be promulgated in terms of performance objectives instead of quantitative requirements, wherever possible.

- Although this effort was not undertaken to improve OJT maintenance effort, the end result of the study will greatly assist commanders in their effort by reducing the overall requirements; therefore more time can be allotted to OJT maintenance.

CHAPTER III

ALTERNATIVE STRATEGIES

RESOURCES AND BENEFITS

GENERAL: The following represents those alternative strategies of promise with related costs and benefits.

ALTERNATIVE 1: Instructional Systems Development

COSTS: This alternative is the subject of an exploratory development effort and, as such, cost factors will be an outcome of the effort.

BUDGET STATUS: The ISD exploratory development effort is programed for Program 6.3 (advanced development) funding in FY82.

BENEFITS

- Instructional Systems Development is viewed as the foundation on which all potential solutions to deficiencies in the instructional/training arena are based. The following benefits are considered attainable with increased emphasis on ISD initiatives:

-- More productive and efficient use of the limited time.

-- A larger number of ISD qualified training managers and instructors.

-- A decreased need for close OJT supervision through an improved application of training media.

-- A standardization of training to include OJT throughout the Marine Corps.

-- A more efficient use of available training assets to include written material, equipment, and facilities.

- Although an initial increase in funding requirements is anticipated, an eventual decrease in expenditures is envisioned as training is analyzed, synthesized, and rendered uniform.

ALTERNATIVE 2 - Training Situation Analysis (TSA) and Task Analysis (TA)

COSTS: ($ Millions)	FY82	FY83	FY84	FY85	FY86	FY87
TA/TSA						
MilPers						
O&M, ML	.1	.1	.1	.1	.1	.1
PMC						

(Budgeted expenditures do not reflect civilian contracts)

BUDGET STATUS: Presently budgeted for.

BENEFITS:

- Through a thorough analysis of an occupational skill and the resulting definitive skill guide, personnel instability should be rendered less critical.

- TSAs will produce a more efficient and productive use of facilities, equipment and personnel.

- TAs will result in improved courseware, design, development, and implementation and therein a more productive Marine.

ALTERNATIVE 3 - Individual Skills Qualification Training System (ISQTS)

COST: ISQTS is in its neophyte stages and the initial model was produced at negligible expense. The future of ISQTS is dependent upon field testing and application.

BUDGET STATUS: Impossible to predict, a possible future POM initiative.

BENEFITS

- Upon adoption, ISQTS would result in standardized training through uniform application of performance standards.

- Skill performance will be easily and accurately measured, thus lessening the severity of supervisory shortages.

- A more efficient use of time will result from a clear-cut analysis of skill requirements.

ALTERNATIVE 4 - Skill Performance Aids (SPA)

COSTS: The Marine Corps is investigating the feasibility of adopting the Army's existing SPAs in which case the cost would be limited to the additional printing expense.

BUDGET STATUS: Not applicable.

BENEFITS:

- By design the SPA is geared to focus in on specific maintenance skills for a specific piece of equipment, thus resulting in effective utilization of time.

- The SPA will provide additional, relevant training materials to the field. SPAs will contribute to the standardization of the OJT maintenance program as they represent a single source authority and guide.

- SPAs presented in multimedia mode will circumvent the lack of instructional expertise.

ALTERNATIVE 5 - Training Extension Course

COSTS: ($ Millions)	FY82	FY83	FY84	FY85	FY86	FY87
TEC						
MilPers						
O&M, MC	.8	.57	.46	.48	.46	.48
PMC						

BUDGET STATUS: Presently budgeted for.

BENEFITS: The Training Extension Courses are presently a part of the Marine Corps correspondence course program. TECs essentially provide the same benefits as previously discussed under the Skill Performance Aids (Alternative 4). Adoption of the Army's SPAs would augment the TEC program and serve as a cost reduction move which otherwise might result in duplicate efforts.

ALTERNATIVE #6 - Computer Based Education (CBE)

COSTS: ($ Millions)	FY82	FY83	FY84	FY85	FY86	FY87
CBE (AI/CMI)						
MilPers						
O&M, MC						
PMC	.62	1.5	1.5	1.5	1.5	1.5
(Items purchased; computer and computer terminals to allow for program expansion)						

BUDGET STATUS: Presently budgeted for.

BENEFITS:

- As CBE expands to include all fields as envisioned, it will result in the follwing benefits:

-- A more efficient use of time through the adoption of self-pacing instructional guides.

-- A decrease in the requirement for supervision.

-- An increase in training materials.

-- A means of updating training materials in a responsive manner.

-- Provides current instructional media replacing the need for instructional expertise.

-- CBE will serve to standardize training through Corps-wide implementation.

ALTERNATIVE 7 - Lessening Excessive Competing Training Requirements

COSTS: Not applicable.

BUDGET STATUS: Not applicable

BENEFITS

- By a lessening of competing training requirements, the following will result:

-- More training time for the OJT programs.

-- A reduction in personnel and material resources required to manage other programs with a corresponding increase in resources devoted to other priorities, e.g. OJT program.

-- Increased funding for OJT programs.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATION

GENERAL: This chapter presents the nature of OJT in the Marine Corps, provides a comparative analysis of problems and suggests possible strategies related to the maintenance OJT program.

NATURE OF OJT: The majority of all initial skill training done in the Marine Corps which leads to a basic MOS is provided in the formal school setting. The Marine Corps does not rely on OJT to train its maintenance technicians but does rely on OJT to train a limited number of skills. Once a Marine has achieved a basic MOS and is assigned to an organization for duty, his training continues. This training is often referred to as OJT but in reality is proficiency training practiced on the job. OJT is primarily designed to reinforce the training received in formal schools.

SEVERITY OF PROBLEMS:

- Although it is difficult to delineate with finality the extent of each of the problems heretofore enumerated, it would perhaps be accurate to state that historically those which follow have had the greatest impact:

-- Personnel instability

-- Limited time

-- Lack of adequate supervisory personnel

-- Non-standard training

-- Limited budget

- It goes without saying that the problems cited above normally do not occur in isolation. To the contrary, they are quite often found in combination plaguing a unit. Any solution must, to the extent possible, address these problems in conjunction with one another if the solution is to have any appreciable effect.

ALTERNATIVE STRATEGIES

- Those strategies highlighted below appear to have the potential to counteract the deficiencies inherent in the maintenance OJT program.

-- ALTERNATIVE 1 - Expansion of Instructional Systems Development

--- The active implementation of Instructional Systems Development (ISD) is seen as the most thorough and comprehensive means of obtaining a satisfactory resolution of the associated OJT problems. ISD involves a systematic instructional approach based on a detailed analysis of training requirements. It is

the training requirements that drive the analysis of any occupational speciality under scrutiny. Eventually the ISD process results in job performance measures and firm criteria on which to establish related programs. These programs have taken the form of other strategies previously mentioned, i.e., Training Extension Courses (TEC), Individual Skills Qualification Training System (ISQTS), Computer Based Education (CBE), Skill Performance Aids (SPA), Training Situation Analysis and Task Analysis (TSA and TA). All of the aforementioned are either elements or products of the ISD process.

-- ALTERNATIVE 7 - Lessening Excessive Competing Training Requirements

--- As addressed in Chapter II, the unit commanders are inundated with excessive training requirements and do not possess adequate resources (time, money, personnel, and facilities) to accomplish the required training. The Marine Corps has undertaken an effort to minimize the impact of competing training requirements.

--- The office of ASD MRA&L (training) could be of great assistance in this area by coordinating/reviewing DOD directives which specify requirements that impact directly upon the amount/type of training done by the services. This coordination effort would ensure that such requirements are truly valid and not counter-productive.

--- In summary, it is considered that Instructional Systems Development, with its numerous and varied applications, can contribute significantly in the resolution of many training ills, to include the OJT maintenance program. It is therefore requested that OSD assist the Marine Corps in improving the OJT maintenance program through reinforcing all ISD initiatives and efforts. Additionally OSD can, wherever possible, take action to reduce external training requirements levied by higher authority.

DEPARTMENT OF THE AIR FORCE
WASHINGTON 20330

OFFICE OF THE ASSISTANT SECRETARY

November 14, 1980

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY (PROGRAM MANAGEMENT)
OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
(MANPOWER RESERVE AFFAIRS AND LOGISTICS)

SUBJECT: On-the-Job Training (OJT) Study Task-
INFORMATION MEMORANDUM

In response to your memorandum of July 31, 1980, members of the Air Staff Training Programs Division participated with your staff and the other services in conducting the OJT study. The Air Force portion of the study is now complete and is submitted for your use.

Nancy Bearg Dyke

NANCY BEARG DYKE
Principal Deputy Assistant Secretary
(Manpower Resources & Military Personnel)

1 Attachment
AF OJT Study

Chapter 1--Description and Evaluation of the Air Force OJT Program

Introduction: The Air Force has a well-defined On-the-Job training (OJT) program managed by a trained, career force of enlisted and officer personnel in the education and training career field. The OJT program is designed to prepare personnel to perform tasks required to support the immediate mission of the unit as well as the long range objectives of the Air Force. The program has evolved on a continuing basis to meet the increasingly technical requirements of many AF jobs. Problems have developed with OJT as formal training has changed to meet budgetary restrictions and focused on skills required for the first job. The AF has identified those problems at all levels and is working to resolve them through reorganization of OJT in some maintenance skills, research in applying automated technology to the problems, and studies of the overall base-level management of OJT.

1. The AF OJT Program

a. The Role and Objectives of OJT.

(1) On-the-job training (OJT) is defined in AFR 50-23 as training received by an airman while he or she is performing in an Air Force Specialty at their duty location. The Air Force considers OJT to be the responsibility of commanders and supervisors in all operational units. It is thus distinct from training received in formal courses which is normally provided by the Air Training Command. OJT incorporates two channels, knowledge training and skill training, in order to permit an airman to acquire both broad career knowledge and job proficiency. The Air Force program for OJT is relatively well structured and operates through self study and supervised practice to complement, and in some cases replace, formal resident training courses. The primary goal of the program is to support combat readiness by ensuring that Air Force personnel can perform their mission essential tasks and duties.

(2) A notable characteristic of the OJT Program is its flexibility to deal with a variety of circumstances, e.g., introduction of new weapon systems, changing job requirements, upgrade in personnel skill level, the organization's need to ensure that personnel attain qualified status on critical job tasks, and special requirements for retraining or crosstraining portions of the work force. Considering all these diverse functions performed through OJT, one is justified in concluding that OJT is a vital part of the overall Air Force Training System.

b. OJT Methodology

(1) Career Knowledge

Career knowledge is gained through study of Career Development Courses (CDCs) written by subject matter experts at ATC resident technical schools, and published and distributed by Air University's Extension Course Institute (ECI). Where no CDC exists for skill-level upgrading, the Study References (SRs) listed on the Specialty Training Standards (STSs) and Job Proficiency Guides (JPGs) are used as career knowledge sources. CDCs are correspondence courses complete with Exercises for Objectives (essay-type questions) and multiple choice type Volume Review Exercises (VREs). Upon completion of all volumes in the CDC, a closed book end-of-course examination (CE) is administered. Timeframe for estimated completion of any CDC is one month per volume plus one month for the CE. Answers to exercises for objectives are contained in the back of each volume for self-scoring, but VRE and CE answer sheets are mailed to ECI for scoring. Ordering of the CDC and feedback results of VRE and CE are automated using the Base Level Military Personnel System (BLPS) computers. ECI communicates by means of AUTODIN lines to Consolidated Base Personnel Office (CBPO) terminals. CBPO OJT staffs then distribute the results to the Upgrade Training (UGT) trainees.

(2) Job Proficiency Training

(a) Job proficiency training within upgrade training qualifies airmen to be independently productive in a job position of their Air Force Specialty (AFS). Within 30 days after arrival at their duty assignment, each UGT trainee must receive an initial evaluation by his/her immediate supervisor. This evaluation, in addition to providing work center orientation and counseling-needs assessment, results in the determination of job tasks to be trained in UGT. By comparing the trainee's existing job skills to the skills required in the position of assignment, training requirements are identified in the form of job tasks which the airman cannot perform.

(b) In order to standardize AFS skill training, ATC, in conjunction with MAJCOMs, uses the Instructional System Development (ISD) process to analyze job data, identify training requirements, and publish a Specialty Training Standard (STS) for each Air Force Specialty Code. Both resident technical school graduate skills and UGT Job Proficiency Skills are indicated on the STS. When used by a supervisor for the purpose of designating UGT (or qualification) tasks for individual airmen OJT programs, the annotated STS becomes the Job Proficiency Guide (JPG) and is inserted in the airman's OJT Record (AF Form 623). This document is the official record of OJT and must be maintained throughout an airman's career (E-1 through E-6). At the 7-skill level point the record becomes optional. Airmen are encouraged to maintain the record's currency thereafter.

(c) All supervisors are required by AFR 50-23 to develop a Master JPG to identify all of the tasks performed in the work center, including contingency tasks and AFS related training requirements. Most of these requirements are annotated on the STS, but other training requirements are documented on the JPG Continuation Sheet (AF Form 797). Work center supervisors maintain the Master JPG and immediate supervisors use it as a guide in developing JPGs for individual trainees.

(d) Job proficiency training for JPG tasks in most AFSCs is accomplished during the normal daily routine. The tasks are certified when the trainer and supervisor are convinced that the trainee can perform them unsupervised. Both supervisor and trainee must initial and date the JPG to certify training completion. Also, unit OJT managers will quality check and certify task performance proficiency during staff visits. These third party evaluations are accomplished on a sampling basis and require "hands-on" performance by trainees for selected tasks on which they have been certified by their immediate supervisor. It is permissible for 3-skill level airmen to perform unsupervised those tasks which are certified on his JPG at the 5-skill level (AFR 66-1, Vol. III, and AFR 66-5). In addition to job proficiency training conducted in work centers, training is also provided by ATC Field Training Detachments (FTDs), Mobile Training Teams (MTTs), MAJCOM training personnel, Wing/Unit maintenance training organizations, and Field Engineering and Technical Services (FETS). Upgrade Training, for a few maintenance AFSCs in several MAJCOMs, has been consolidated under wing or unit training activities:

- o TAC - Consolidated Aircraft Maintenance Training (CAM-T),
- o ADCOM - Maintenance Training Units,
- o SAC - Aircraft and ICBM Maintenance Training,
- o MAC - Unit Level Maintenance Training Centers.

The trend in OJT programs, at least for maintenance specialties, is toward centralization and standardization of 5-skill level upgrading and qualification training of newly assigned personnel.

c. OJT Process

(1) The minimum time which must be spent in OJT to qualify for upgrading in skill level is specified in AFR 35-1, Military Personnel Classification Policy. Time is presently considered by supervisors and managers to be an important measure for evaluation of both individual trainees and UGT programs. Trainee progress toward meeting estimated completion milestones is closely monitored. The following event completion dates are projected from the date entering training (DET):

(a) Initial Evaluation within 30 days of DET

(b) Enroll in Career Development Course (CDC)

Volume Review Exercise

I date	=	DET + 1 mo
II date	=	DET + 2 mos
n date	=	DET + n mos

(c) CDC End-of-Course (CE) Completion

CE administration date = DET + CDC Vol N + 1 mo

(d) JPG Task Certification

JPG Completion date = DET + Minimum Mos. specified in AFR 35-1

(e) UGT Completion

UGT completion date = DET + Minimum Mos. specified in AFR 35-1

(2) Once established, these dates are seldom revised. AFR 50-23 specifies that three evaluations are to be made should UGT trainees not progress rapidly enough:

(a) First evaluation by the supervisor not later than 2 months after minimum months in UGT specified in AFR 35-1.

UGT to 5-level - 8th month superv. eval.
UGT to 7-level - 14th month superv. eval.

(b) Second evaluation by the unit commander not later than 6 months after minimum months in UGT specified in AFR 35-1.

UGT to 5-level - 12 month comm. eval.
UGT to 7-level - 18th month comm. eval.

(c) Final evaluation by a personnel classification board not later than 12 months after minimum months in UGT specified in AFR 35-1.

UGT to 5-level - 18th month board action
UGT to 7-level - 24th month board action
(These times are maximum training periods)

(3) Trainees who reach the second evaluation point are considered to be in "overtime training" and those who reach the board action point are in "excessive training".

(4) Individual trainee progress monitoring from the date entering training is keyed to monthly completion of CDC VREs. While the trainee actually works on the VRE questions during slack periods in the work schedule or off duty, the answer sheet for each VRE must be marked by the trainee in the office of the squadron OJT manager. The OJT managers use this event as a convenient time to review the JPG which the trainee has brought from his work center. The review may include spot checking past VRE results, noting the supervisor's documentation of VRE review training, reviewing the Form 623a--a comment section, and identifying JPG tasks completed during the last month by scanning the date completed column. Routing the JPG and a cover letter comment sheet back to the work center supervisor by way of the various wing, squadron, section or flight training offices/desks, informs the chain-of-command of the trainee's progress.

2. Problems in OJT

a. Problem Identification

The five major problem areas identified by the Air Force Inspector General in their report represent the areas of most immediate concern to the Air Force. These problems relate primarily to procedures and management techniques rather than to flaws in the basic training concept.

(1) More streamlined administration and record-keeping, so that management attention can be focused on the substance rather than the form of the OJT Program

(2) Valid and current training requirements for OJT trainers and supervisors

(3) More rigorous evaluation of trainee task proficiency

(4) Mechanisms for determining cost of OJT and capacity of units to provide quality OJT without degradation of mission performance

(5) Expanded roles for training technicians which would shift emphasis from the administrative and clerical to the professional and consultative.

b. Problem Evaluation

(1) Administration - The problems with administration and record-keeping are common to many other areas. OJT management procedures are continually monitored to reduce unnecessary paperwork.

(2) Standardized task training requirements - A general consensus that the STS is not specific enough to identify tasks by position for training has caused many work centers to repeat

and expand STS items on the JPG continuation sheet. Redundant documentation and reporting has resulted. In an effort to correct this deficiency, the Air Force Human Resources Lab and Air Training Command are supporting the Air Force Manpower Personnel Center in developing Standardized Position Oriented Training (SPOT) listings using occupational survey data. The SPOT approach holds promise for defining training objectives for each position in a given AFS. Current research may offer an alternative in that job data at the position level could be accumulated and analyzed from a bottom-up synthesis of AFS structuring. In this manner, a close job relevancy to training tasks may be attained and specified in the task-by-position data base.

(3) Evaluation - Resident ATC technical courses have Plans of Instruction (POI) clearly describing graduate skills in terms of learning objectives. These skill statements lose specificity in translation to STS format. Consequently, much of the training received in resident technical school is repeated in UGT programs at the unit level. Current research should approach this problem by providing better diagnostic tools for the supervisor to use in determining training requirements. Also, except for those job tasks involving equipment and personnel safety hazards, and those tasks which require certification, OJT task proficiency is not evaluated with the degree of standardization which instills confidence that airmen completing OJT programs are capable of meeting job requirements. Objective, evaluation criteria, procedures and quality control elements are of utmost importance.

(4) OJT Cost and Unit Training Capability - While there has been significant research on costing of OJT, no acceptable procedure has emerged that provides a consistent capability to compare the cost of OJT with costs of formal training. The ISD process provides the OJT/Formal Training break from a training requirements perspective, but as of now, no capability exists to match training requirements with resources and unit training capability.

(5) Better use of Training Technicians - The following is a description of the training technician's common duties. While the description provides a framework for important contributions to base and organizational level training programs, in practice the OJT monitor frequently is utilized as no more than a record keeper and statistician. A need exists to better use this valuable resource:

Training Technician (AFSC 751X2) Specialty Description

Develop and administer OJT and maintenance training programs, make periodic visits to units to evaluate and provide guidance to improve programs; coordinate OJT and maintenance training activities with FTDs, OJT Advisory Service and CBPOs; maintain training records and statistical data for reporting and analysis; coordinate scheduling of facilities and other resources;

provide advisory service in the development and use of training aids, curriculum and other materials; determine requirements for unit training, requisition and control tests and materials for the evaluation of training, ensure availability of JPGs, STSs; track progress of, and counsel trainees; control, schedule and administer end-of-course tests for CDCs, maintenance training qualification tests; evaluate OJT, advise commanders of results, recommends corrective action as required; prepare and conduct courses for supervisors and trainers in training techniques and methods of instruction.

3. Training Trends Which Impact the OJT Program.

a. During the 1970s the Air Force experienced "downsizing" as the Vietnam era closed and attention turned to a peacetime force. Priorities shifted from fighting a war to managing force modernization. In concert, training concepts were altered to reduce the resources devoted to training and make more resources available to modernize the existing force. In training, the focus increasingly shifted from training a generalist to training a more specialized airman and limiting training to tasks used in the first term. Expressed in terms of costs, the training budget in the late 70s was about 4% of the total Air Force budget compared to over 6% in the early 70s. Part of the reduction was, in fact, due to force reduction (not having to train on a one-for-one replacement basis), but a restructured training strategy accounted for much of the reduction. Overall, the average initial skill course decreased from 16.8 weeks in 1970 to 11.0 weeks in 1980. Examples of the new training strategies were the "Able Chief" program for aircraft maintenance training and the "Bright Spark" program in the communication-electronics training. "Able Chief" reduced tech school training for crew chiefs by shifting from career oriented "representative" training in the schoolhouse, aircraft familiarization training in FTDs, and task qualification training in unit OJT programs to "first job" oriented resident training with system specific task oriented "hands on" training in Field Training Detachments and qualifications achieved on most tasks before trainees begin OJT. "Bright Spark" shortened electronics courses by reducing instruction on basic principles. This theory is now taught with portions of the equipment phases which reduce the time required in the schoolhouse.

b. The restructure of training programs in the 1970s has not been without problems. While airmen are trained for their first job assignment, they require more OJT to master skills and assume supervisory duties. Formal school career training designed to give enlisted people broader training has only been partially funded--shortages in the TDY-to-school program prevent sending the required number of career people back to school, and courses are shorter than using commands would like. This results in both increased demand for and reduced capability to provide OJT. Shifting training to the unit has required use of operational equipment which impacts on maintenance and flying schedules. Also, streamlined maintenance organizations, such as the Production Oriented Maintenance Organization (POMO), offers more flexible use of personnel and often results in broadened duties for many sortie producing specialties.

Many airmen require cross utilization training, which increases the overall unit training requirement. Concomittantly, lagging pay scales and increasing civilian demand for technical skills reduced availability of skilled technicians in field units--people who serve as OJT trainers. As a result, the combination of more narrowly trained airmen and reduced unit OJT capability has caused significant problems. To compensate, we now see more formalized (classroom) OJT in the units covering some training formerly done in the schoolhouse. By some accounts the OJT problem is significant and growing, especially as retention problems aggravate shortages in supervisory hours devoted to training.

Chapter 2 --Strategies for Solving OJT Problems

1. To cope with the training problems being experienced, especially the OJT problem, several strategies hold promise for improving the situation. This Chapter discusses several options which have potential for improving training in the Air Force. While they represent alternatives, it should be noted an optimum training pattern involves a mix of training strategies--no one option is "best" to the exclusion of others. The appropriate mix is different in each specialty, and can only be determined when the Instructional System Development Process is allowed to proceed without excessive prior constraints on manpower, time, and dollars--constraints which occur with increasing frequency.

2. Options for Improving Training.

a. Lengthen Initial Skill Training. One option which would have an immediate positive impact on the OJT program would be the selective lengthening of initial skill courses. The objective would be to include subject knowledge training for major duty assignments which most airmen in a specialty may be assigned during their first enlistment, as well as task performance for the initial duty assignment. This would allow transfer of some training tasks and knowledge from the field to the schoolhouse and produce a better qualified airman who requires less intensive OJT. The question becomes how much should the courses be lengthened. In most cases ISD analyses have identified training increases in particular courses. In the past, due to budget considerations, either a course was expanded based on a tradeoff in resources with another course, or the needed increase was held in abeyance for lack of resources. Based on limited information, a program increase in the range of one to two weeks for the initial skill average course length is needed. The ISD process would be followed to make the applicable allocation of resources to individual courses. No resources are programmed for this option in FY 81 and FY 82. Lengthening initial skill training will be an FY 83 POM consideration.

b. Increase TDY-to-School Program to fully fund career training for NCOs. The restructure of training during the mid 70s to focus on the first job assignment created a need for more career training for NCOs. Because airman are more narrowly trained, they lack the full range of knowledge and skills to function as a master technician or work center supervisor. Originally, when the first term training concept was introduced, the commands were promised adequate skill progression training to send individuals back to school after a career decision. Advanced training after the career decision point is profitable since the payback on the training investment is more assured. In reality, numerous reductions of O&M money and travel limitations have cut the number of TDY-to-school spaces, while actual travel cost increases have outstripped programmed inflation rates. The option--increasing the TDY-to-school program--will pay immediate dividends by reducing the current OJT burden and at the same time provide career training to future supervisors who are essential for the effective conduct of OJT.

c. Increase Resource Support for Training Development. Two types of training development constitute the major share of the Air Force development effort. First, those supporting new systems or major modifications, and secondly, revisions to established training programs to keep them targeted to job requirements. These two efforts are effectively supported within the existing program management and funding structure of the Air Force. A third category currently languishes for lack of adequate program support: training development efforts of major scope which cut across weapon systems and/or result from significant restructure of the personnel classification system. Examples include the introduction of digital technology into communication/electronic systems, conversion to integrated avionics systems, development of space systems technologist training, adoption of channelized, hands-on training (with the increased requirement for training equipment and devices), and the impending introduction of high technology training delivery systems themselves. Also, there is a very valid requirement for development and integration of a wide variety of computer based instructional delivery systems to support training programs across a broad spectrum of specialties. Since these programs involve many Air Force organizations and a sizeable resource investment, we need a way to provide management emphasis and resource support to these efforts without decreasing support for ongoing course revisions. Since the appropriately near term focus of current program managers tends to accord such development efforts low priority in funding competition, distinct organizational elements and management structures need to be established to assure sustained attention to these needs.

d. Increase Support for Research and Development Projects for OJT. While the Air Force has already initiated several R&D projects to address identified OJT deficiencies, more remains to be done. The following identifies both the ongoing R&D projects which support OJT and the planned R&D projects.

(1) Ongoing Research Efforts:

(a) Impact of Advanced Instructional System (AIS) Development on OJT - monitor the AIS development program and recommend appropriate technology for tryout in the OJT setting. Also assess the impact of AIS on OJT to identify potential problems in transitioning AIS graduates into traditional 5-level upgrade programs.

(b) Analysis of Unit OJT Capability - Identify factors impacting on OJT capacity of operating units, examine and quantitatively define the capacity of units to conduct OJT so that relationships between training load, training quality, and unit effectiveness/readiness can be specified; provide operable formulas/decision rules for predicting and establishing maximum OJT loads at the unit level.

(c) Development of Standardized Position Oriented Training (SPOT) System - Development of better methods of identifying OJT task training requirements. The STS is too general to meet OJT needs and requires expansion by working level supervisors. HQ USAF is experimenting with a new position oriented approach to OJT called SPOT (Standardized Position Oriented Training). Specific objectives are to develop new ways of organizing occupational survey data so that they can be used to design various characteristics of the SPOT system, options of the SPOT system in OJT, and to design and evaluate prototype SPOT systems.

(d) Development, Test and Evaluation of an Integrated Job Oriented Literacy Assessment and Enhancement Program - Develop, test, and evaluate a job task oriented functional literacy assessment and enhancement program.

(2) Planned Research

(a) Training Decision System

1. OBJECTIVE: To develop, test, and evaluate a Training Decision System which allows training managers to assess the impacts of alternative assignment of job tasks to training settings.

2. DISCUSSION: Decisions to provide skill training through resident formal training, field training detachments, or OJT are currently made and revised through a series of conferences and staff actions. The rationale is not documented in a readily available format, and decisions are often based upon incomplete data. Three kinds of information are needed to make informed, defensible (and therefore lasting) decisions: Task characteristics (frequency of performance, percent members in a specialty performing, difficulty, and skill/knowledge clustering); field utilization patterns (geographic distribution of task-clusters, assignment patterns, CONUS/oversea imbalance, etc.); and resource impacts associated with training setting (time to criterion, productive work output, training resource requirements, travel pay, support costs, etc.). The training decision system would integrate three subsystems (one for each of these basic kinds of information).

3. VALUE: Such a system would permit managers to identify where additional training is needed and where existing training is underutilized. It would permit adjustments required by resource limitations to be made with the least impact. Finally, it would facilitate the career force person job match by clearly identifying and quantifying the skill and knowledge requirements of most Air Force duty positions.

(b) Integrated Training System

1. OBJECTIVES: To develop specifications for an integrated OJT Training Management and Delivery System; to develop, test, and evaluate a prototype system which satisfies the system specifications.

2. DISCUSSION: Current OJT training management and delivery systems have been declared minimally effective by MAJCOM functional managers, training managers, and inspectors. These findings were validated by the Air Force Inspector General and Air Staff. While, diligent effort has produced some improvement during the past two years, other factors have combined to tax OJT capability. Resident course reductions have forced greater reliance on OJT. Declining field experience levels are further limiting unit OJT capability. A comprehensive and sustained effort is needed to assure required Air Force capability to qualify technicians for performance of critical job tasks is developed and implemented. Previous applications (1978) of computers in training have proven effective from managerial and instructional perspectives, but were cost effective only in carefully selected applications. However, cost effectiveness is expected to double every two years for this decade. Pressure on the defense sector of the federal budget will intensify as the working population ages, the proportion of retired workers and social security annuitants to productively employed adults grows, and wage scales increase to keep pace with inflation. Energy costs will increase pressure to reduce expenditures for TDY-to-School training. Large scale application of information technology to training requirements at job sites will become imperative early in this decade. However, the system development effort and transition of the technology into operational settings is labor intensive. The project must begin soon if we are to capitalize on available hardware by the mid 1980s.

3. VALUE: The development and demonstration of a prototype system for the conduct, management, and quality control of the OJT Program will permit the Air Force to qualify people for job performance within increasingly severe manpower and dollar constraints.

Chapter III--Alternative Strategies: Resources and Benefits

1. This chapter addresses the resources--dollars and manpower--required to implement the various training strategies identified in Chapter II. Following each statement of resources is a capsulized summary of expected benefits. Benefits of each option were more thoroughly discussed in Chapter II. Unless noted otherwise resources to implement the training options are unprogrammed and unfunded. Except where noted the resources are estimates. Provided internal Air Force priorities permit, the below listed options will be candidates for funding in the FY 83 POM.

2. Option One: Lengthen Initial Skill Training from 11.0 weeks average to 12.5 weeks average.

a. Resources:

PEs 84731, 84733, 84734, 86761, and 85796

Dollars[1/]

	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
3400	-	8.73	6.24	6.51	6.25	6.25
3500	-	21.28	22.59	23.56	22.60	22.60
TOA	-	30.01	28.83	30.07	28.85	28.85

Manpower

	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
Students	-	2074	2201	2295	2203	2203
Perm Party[2]	-	648	688	718	688	688
Total[3]	-	2722	2889	3013	2891	2891

1 FY 82 constant dollars.
2 Includes BOS and instructor support.
3 Manpower based on accession levels in FY 82 BES.

The above resources would support an increase of 1.5 weeks of initial skill training. Currently the programmed average weighted course length is 11.0 weeks (77 days) for FY 81 and FY 82 with the programmed time in training 11.6 weeks or 81 days. The increase would bring the programmed average weighted course length to 12.5 weeks and time in training to 13.1 weeks. The resources cover instructors, students, and base operating support.

b. Benefits: The lengthening of the average time in training for initial skill courses in selected AF specialties would have the most immediate beneficial effect on the OJT program. This would allow certain tasks to be moved from OJT to the classroom. Consequently, units could concentrate on fewer OJT tasks and provide better OJT. Also, conflicts between mission requirements and the OJT burden would be reduced. Also, in some cases selected specialties could be converted to formal initial skill training vice directed duty for OJT. Functional managers have consistently asked for formal initial skill training for those skills that currently use directed duty assignees. Overall, increasing initial skill courses would make better use of skilled personnel resources and lessen the OJT burden.

3. Option Two: Increase TDY-to-School Program.

a. Resources:

PEs 84731, 84733, 84734

Dollars[1]

	FY 82	FY 83[2]	FY 84	FY 85	FY 86	FY 87
Appropriation						
3400	2.9	2.9	2.9	2.9	2.9	2.9
TOA	2.9	2.9	2.9	2.9	2.9	2.9

1 FY 82 constant dollars.

2 FY 83 - 87 requirements will be based on need as identified by users, retention patterns, and increased accessions which started in FY 79.

The above resources will fund an additional 3,600 TDY quotas in FY 82. The FY 82 resources were included in the FY 82 POM and FY 82 budget submission. For FY 83-87 the requirement is likely to go beyond the 3,600 quotas added in FY 82.

b. Benefits. Additional TDY-to-school quotas will allow career NCOs to expand needed advanced and supervisory training. The skills acquired in tech school will pay dividends as these individuals become firstline supervisors and manage the OJT program. Also, obtaining advanced skills in tech school reduces the unit OJT burden.

4. Option Three: Increase Resource Support for Training Development.

a. Resources

PE 84772

Dollars ($ in Millions)

	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
3080	-	0.10	0.10	-	-	0.10
3300	-	0.10	0.20	-	-	-
3400	-	0.15	0.20	0.75	1.00	1.56
3500	-	0.62	1.00	1.16	1.16	1.16
TOA	-	0.97	1.50	1.91	2.16	2.82

Manpower

	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
Officers	-	8	11	11	11	11
Enlisted	-	15	25	38	38	38
Civilian	-	7	13	13	13	13

Above resources will be used to augment the ATC ISD training course to provide responsive training on ISD to other MAJCOMs. Secondly, resources will be used to form a pool of highly qualified training developers within ATC.

b. Benefits. Implementation of this option would provide a training development capability for efforts that exceed the scope of revisions to existing training programs, but fall short of being a major training effort associated with the system acquisition/ modification process. For example, this training development capability would be used to restructure training to coincide with the introduction of integrated avionics into the several maintenance specialties.

5. Option Four: Increase Support for Research and Development Projects for OJT.

a. Training Decision System

(1) Resources:

PE 62205

Dollars ($ in Millions)[1/]

	FY 83	FY 84	FY 85	FY 86	FY 87
3600	0.50	0.35	0.35	0.25	-

1/ FY 82 constant dollars

The above resources would fund the development, testing, and evaluation of a Training Decision System. Funding will be addressed in the FY 83 POM.

(2) Benefits. The Training Decision System would allow managers and training developers to assess the impacts of training a particular task in a given setting i.e. OJT vs formal school. Such a system would facilitate training efficiency and decrease cases where training tasks would overburden OJT programs.

b. Integrated Training System

(1) Resources:

PE 63751

Dollars ($ in Millions)

	FY 82	FY 83	FY 84	FY 85	FY 86
3600	0.90	1.20	1.30	1.60	2.0

Resources listed above support an R&D project to set specifications for and develop a prototype system for the management and delivery of OJT. This program would integrate previous and ongoing research projects. This project is currently in the FY 82 BES.

(2) Benefits. Funding of the R&D for the Integrated Training System will give the AF a prototype system for the conduct, management, and quality control of OJT for the future. The system will provide the best use of training dollars in the late 1980s and 1990s.

Chapter IV--Conclusions and Recommendations

1. The strategies defined in Chapter two and quantified in Chapter three hold the best prospect for improving the OJT program--particulary in the maintenance skills--for both the near and long term. The options listed to improve OJT are equally applicable to maintenance and other skills since the Air Force approach to training and OJT does not radically differ from skill to skill. However, in implementing the recommended alternatives, a significantly larger share of the resources would be devoted to maintenance related skills.

2. For the near term, supplying more TDY-to-school quotas can have the most immediate effect on OJT. The increase would be effective in FY 82. This training is top priority and urgently needed. For example, the Commander of the Military Airlift Command is on record stating he is receiving less than half the TDY school seats he really needs. OSD support of the additional 3600 school quotas in the budget process is required to make sure the dollars stay in the FY 82 budget.

3. Lengthening initial skill training by 1.5 weeks average would offer relief to the OJT program about two years from now--our second most immediate need. Cuts to formal school training have transferred training tasks to the field and saturated the OJT program. Ten to twelve-hour days and six-day weeks are not uncommon in the maintenance shops. There is precious little time available for quality OJT. The increase to formal school course lengths for initial skill training would relieve the OJT program, especially for upgrade to the five skill level. Also, functional managers have requested formal initial skill training for some skills now relying strictly on OJT. The increase in student authorizations and associated training tail would allow us to address this training issue which has gone unresolved for lack of resources over the past few years.

4. The funding of the training development PE and support for R&D projects for OJT offer the best mid and long term cures for OJT. Too often lack of resources prevents the ISD process from yielding the greatest benefit. Alternate training patterns, new training technology, and especially computer based training are not given a full hearing during the ISD process because of scarce training development resources. Right now routine course revisions--those needed just to keep courses responsive to field needs--are about all that can be accomplished. We need a better training development capability to take advantage of advancing technology--to let us train as well as we know how to. For years R&D in support of training has lanquished for lack of support. The two R&D projects cited in Chapters two and three deserve support. These projects offer the best hope of improving OJT in the outyears. Fully funding PEs 64751 and 62205 will insure that needed training R&D gets done. We firmly believe we must begin now to solve the OJT problems of the late 1980s and 1990s.

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OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS

20 JUN 1980

MEMORANDUM FOR Mr. Chase
Mr. Groover
Mr. Riley ✓
Mr. Stone
MG Tice
Mr. Shorey

SUBJECT: Hardware-Manpower

The efforts to date have convinced me of the following:

- o There is a disconnect between characterization of weapon system demand and the supply which masks the scope and severity of problems for the 1980-1990 period.

- o Improved visibility is needed of the most critical current maintenance manpower problems and training problems and quickly implementable measures to augment shortfalls.

- o There is a need to better identify the problems of attracting and retaining a central core of skilled maintainers -- particularly for areas of high civilian sector demand -- and to develop innovative measures to build the needed capability.

I would like to initiate several follow-on actions with Service involvement to attack these problems. Your planning should envision completion of analysis and development of recommendations by 1 November 1980. To meet this date, your implementing directions and substantive plans needed to be completed in the next month (31 July). The tasks to be undertaken and the organizations assigned lead responsibility are:

- o To develop the best possible Service and OSD analysis of the difference between weapon system maintainer demands and projected supply for maintenance manpower. This must develop to the extent possible an improved means of characterizing demand versus supply in such a way that major problems become visible. Efforts will be made to relate increases in MOS complexity to increases in aptitude requirements, training requirements, and experience requirements to a maximum extent feasible. Projected increases in these requirements will be related to estimates of the supply. (Shorey/Tice/Groover)

- To develop recommendations for near-term improvements by the Services to weapon system maintenance. This will include an examination by the Services and OSD of current maintenance problems related to proficiency and availability of manpower, evaluation of fixes which have been tried, and development of proposals for near-term measures which should be further evaluated. Near-term funding requirements will be identified. (Riley)

- To develop a recommended near-term Service program for augmenting maintenance training. Both institutional training and OJT deficiencies will be considered, but with emphasis on the latter. Development of the recommended actions will result from Service analyses and identification of critical shortfalls particularly where maintenance training requirements have been underestimated or under funded (for example, for key diagnostics or other high technology functions) and in particular where lack of OJT resources, task complexity, and aptitudes in combination may make the problems severe. (Stone)

- To develop innovative measures to provide a supply of experienced maintainers for critical occupations. Recommend a program for adoption of the most promising measures. (Groover)

Specific weapon system class and/or occupational examples to be assessed in detail for the analyses will be agreed within the next week and circulated by Russ Shorey.

Richard

Richard Danzig
Principal Deputy Assistant
Secretary of Defense (MRA&L)

cc:
Mr. Bergmann, ODASD(RR)
Dr. Martin, ODASD(MPP)
LTC Schroetel, ODASD(MPP)
Dr. Sicilia, ODASD(RR)
Mr. Singer, SP
Mr. Tucker, ODASD(PM)
Mr. Turke, ODASD(DS)

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

MANPOWER
RESERVE AFFAIRS
AND LOGISTICS

28 JUL 1980

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS

SUBJECT: Manpower Resources versus Equipment Complexity

We all face problems of recruiting and retaining sufficient numbers of skilled personnel while concurrently overseeing the introduction of increasingly more complex hardware. It is important that we develop a better understanding of the implications of these manpower/equipment complexity trends for our future military capability. Based on that understanding I hope that we can initiate an effort to work together toward some solutions.

Towards this end, I would like to meet with your Assistant Secretaries most directly concerned with manpower, readiness, training and maintenance issues to gather information and discuss some of the ramifications of the trends. I will ask the Director of Net Assessment and the Principal Deputy Under Secretary DR&E to join us. Enclosure #1 is a suggested discussion guide which highlights some of the topics that might be covered at this meeting. My hope would be that each Service might have a spokesperson speak for about 15 minutes conveying his informal impression of the situation in his Service along the lines sketched in Enclosure #1.

Beyond this, I propose that we undertake a joint OSD and Service effort to more precisely bound the scope and severity of our DoD maintenance manpower problems for 1980-1990 and to conduct a comprehensive evaluation of alternatives to deal with these problems. While we are all concerned about today's problems, we must also be concerned about implications of this situation for the future as we introduce a number of new weapons systems. The early identification of the numbers of maintenance people required for new systems has been recently established in the DSARC process. What is less clear, however, is whether requirements are determined at a sufficient level of detail far enough in advance to affect the supply in a timely way. A parallel concern is whether the means of translating weapon system task complexity into maintainer skill requirements and subsequently into accession and training requirements gets the best match between personnel attributes and experience, and job requirements. These questions may particularly apply to actual high technology areas and where there are substantial increases in requirements.

At a meeting of the sort described in Enclosure #1, I will propose a joint OSD/Service effort to prepare, by November 30, an initial report which summarizes available information. The objectives of this effort and a suggested task force organization to carry it out are detailed in Enclosure #2.

My staff will contact your offices within the coming week to schedule the meeting described in Enclosure #1.

Richard Danzig
Acting Assistant Secretary of Defense
(Manpower, Reserve Affairs, and Logistics)

Attachments

cc:
Director, Net Assessment
Principal Deputy Under Secretary
DR&E

Discussion Guide

Enclosure 1

The Trends

- Manpower Capability
  - Indicators and/or measures of the trends.
    + What are they? (literacy, grade level achievement, test scores, in service tests, retention, average experience, others?)
    + What do they show in terms of decline from a representative baseline?
- Equipment Complexity
  - Indicators and/or measures of the trends.
    + What are they? (adjusted costs, size of technical manuals, test requirements, number of repairable parts, maintenance time, designed MTBF, other?)
    + Which are the most valid, accurate, reliable?
    + What do they show?
- Job complexity and Skill Demands
  - Indicators and/or measures of trends.
    + What are they? (numbers of tasks, different types of equipment to be maintained, decision requirements?)
    + Where are the areas of greatest increase?

Results of the Trends

- Training Requirements
  - Indicators and/or measures of the extent of the problem.
    + What are they? (increased training time, need to revise manuals, reduced level of competence as measured by tests, other?)
    + Which are the most valid, accurate, reliable?
    + What do they show?

- Maintenance Capabilities

  - Indicators and/or measures of the extent of the problem.

    + What are they? (need to revise maintenance procedures, experience requirements, aptitude requirements; more maintenance personnel required, reduced system availability, shorter MTBF, higher error rates, more accidents, other?)

    + Which are the most valid?

    + What do they show?

- Operational Capabilities

  - Indicators and/or measures of the extent of the problem.

    + What are they? (readiness measures, exercise scores, other?)

    + What are the most valid, accurate, reliable?

    + What do they show?

Solutions Underway or Identified

- Trends being addressed.

  - Which, how, prospects for success?

  - How will success be measured? (in terms of changes to trends, other?)

- Results of Trends being addressed

  - Which, how, prospects for success?

  - How will success be measured? (in terms of improved capabilities?)

- Effort to bound the problems

Enclosure 2

Overall Objectives

- o Characterization of the gap between the projected demands for and supply of maintainers for the 1980's time period - including establishment of upper and lower uncertainty bounds on this gap.

- o Identification of the most critical current maintenance manpower and training problems and quickly implementable measures to alleviate shortfalls.

- o Clarification of the problems of attracting and retaining a central core of skilled maintainers -- particularly for areas of high civilian sector demand -- and development of innovative measures to build the needed capability.

Ongoing Actions

To address these issues, the DASD (Program Management) and the DASD (Supply, Maintenance and Transportation) have initiated actions to organize two OSD/Service task groups. The general guidance given these groups is:

- o Develop a recommended near-term program for augmenting maintenance training in each of the Services. Both institutional training and OJT deficiencies should be considered, but emphasis should be placed on the latter. The recommended actions should be a synthesis and/or extension of Service analyses and should seek remedies to critical shortfalls, particularly where maintenance training requirements have been under-estimated or under-funded (for example, for key diagnostics or other high technology functions) and where lack of OJT resources, task complexity, and aptitudes in combination may make the problems severe.

- o Develop recommendations for near-term improvements by the Services to weapon system maintenance. This effort might include: an examination of current maintenance problems related to proficiency and availability of manpower evaluation of fixes which have been tried by other Services or on other weapons systems, and development of proposals for mid-term measures which should be further evaluated.

Planned Actions

In order to gain a comprehensive understanding of the scope and causes of current and potential problems as well as to assure that relevant solutions are evaluated and explored on a common base, a coordinated OSD/Service effort is needed. An OSD/Service steering group will be constituted to oversee the efforts.

Two additional OSD/Service task groups should be planned: one to bound the scope of the maintenance manpower problems in terms of demand and supply and the other to investigate solutions to building and retaining a central core of skilled maintainers. The planned task force objectives are:

- Develop the best possible analysis of the difference between weapon system maintainers demands and projected supply of qualified personnel. Emphasis should be placed on trends in aptitude requirements and the sensitivity of demand and supply projections to assumptions about job complexity, economic conditions, and military compensation. Government civilian and contractor maintenance will be included within the scope of this analysis.

- Develop innovative measures to provide a supply of experienced maintainers for critical occupations. Alternatives for consideration should include ways both to increase the number of skilled military maintainers, and to substitute for them equally skilled civilian personnel in some instances.

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D C 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS
(Program Management)

31 JUL 1980

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (M&RA)
ASSISTANT SECRETARY OF THE NAVY (MRA&L)
ASSISTANT SECRETARY OF THE AIR FORCE (MRA&I)

SUBJECT: On-the-Job Training (OJT) Study Task

On 28 July 1980 Mr. Richard Danzig, Acting Assistant Secretary of Defense (MRA&L), sent a memorandum to the Secretaries of Military Departments entitled "Manpower Resources versus Equipment Complexity". The memorandum proposed a joint OSD-Service effort to determine the maintenance problems posed by shortages of maintenance personnel with the required skills in a time when the complexity of the maintenance task is growing, and to identify possible solutions to the problems. The study effort is to be divided into four mutually supporting parts. Mr. Danzig tasked me several weeks ago to take the lead, with Service assistance, on one of these four efforts. This effort is intended (1) to identify deficiencies in maintenance training, especially in Service OJT programs, that contribute to less than satisfactory maintenance, and (2) to recommend near-term actions to alleviate these deficiencies. This effort was to begin immediately and to be completed by 1 November. Consequently, we have been working since the middle of July with training officials on the staff of each Service to carry out the initial phase of the study effort. Specifically, we have been working with the following offices:

Army:	Director of Training, ODCSOPS
Navy:	Director, Total Force Planning Division (OP-11)
Marine Corps:	Director of Training
Air Force:	Director of Personnel Programs (AF/MPP)

The purpose of this memorandum is to request officially the continuing support of each Service in carrying out this on-going study effort. For Phase I of the study effort, we have asked the training officials of each Service to

provide us by 11 August definitions and descriptions of the various types of OJT conducted by that Service and to identify problems in these OJT programs and the causes of these problems. To keep the study manageable, the effort will focus on electronics and avionics maintenance (two skills used by all four Services) and one other skill to be selected by each Service. In subsequent phases, we, with Service assistance, will identify and analyze alternative strategies to improve OJT programs, determine the costs and benefits of the more promising strategies, and prepare recommendations and a report to ASD(MRA&L).

This study plan obviously relies heavily on Service cooperation, since detailed knowledge of maintenance problems and deficiencies in OJT programs is found only within the Services. I request your assistance in assuring this cooperation. With full help from the Services I am hopeful that we can make a substantial contribution to better maintenance through improved OJT programs.

Robert A. Stone

ROBERT A. STONE
Deputy Assistant Secretary

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS

9 JUL 1980

MEMORANDUM FOR MG James C. Smith, Director of Training, ODCSOPS, Army
RADM J. B. Mooney, Jr., Director, Total Force Planning Division (OP-11), Navy
Col B. Colassard, Acting Director of Training, Hq Marine Corps
MG H. L. Emanuel, Director of Personnel Programs, Air Force
Col D. B. Brackett, AF/MPPT (DETEC Secretary)

SUBJECT: OJT Study Task

You will recall our brief discussion at the last DETEC meeting about the adequacy of maintenance OJT programs and my memorandum of June 11 alerting you to the requirement for a study on this issue. Mr. Danzig, our Principal Deputy Assistant Secretary of Defense (MRA&L), has tasked me to take the lead in studying and recommending solutions to the OJT problem in connection with maintenance programs. The attached draft memorandum, which I expect will be signed out by next week in a form similar to this, puts the OJT study task in context with a more all-encompassing study planned on maintenance manpower.

Many people in MRA&L have concluded that OJT programs are not contributing as much as they should to producing a well-qualified body of maintenance personnel. I think this view is probably correct. However, I do not know the exact nature or extent of the deficiencies, their causes, or what needs to be done to correct them. The specific study task is to determine these unknowns and to complete a report by November 1, 1980, which will include recommendations for appropriate actions to improve maintenance OJT programs in each Service. Active participation by each Service, as indicated in the enclosure, will be required in conducting the study and producing useful results. Since there is much to do and not much time to do it, we need to move out on this project immediately rather than waiting for the August 1 beginning date specified in the enclosure. To initiate this effort, I ask that you or your representative meet with me in my office (3B-930) at 1400 on Wednesday, July 16. At the meeting we can discuss basic factors bearing on the OJT problem and outline a plan and set milestones for the study. I also need a bibliography, or preferably copies, of studies that bear on OJT.

An early task must be to decide what we mean by "OJT". Everybody uses the term, but there is a wide range of perceptions on what it includes. The original concept, I think, was that of the apprentice with no formal training learning his trade by working under the supervision of the master craftsman; however, this situation applies to only a small proportion of servicemembers today. A much more prevalent form of OJT, and one that also is founded on enhancement and sharpening of skills mainly through work experience, is the process that makes journeyman workers into highly skilled technicians and supervisors. While this process is highly important, it is not very clear to me how the process can be improved materially by upgrading Service-wide policies and procedures, since the main impetus

must come from each individual and his junior-level commanders. If this is true, perhaps the focus of our efforts should be on that form of OJT that applies to the junior servicemember joining his first unit of assignment after graduating from initial skill training. This servicemember typically is trained only to the apprentice level, is less than fully productive until he gains job experience, and requires both specific training in tasks not taught in school and reinforcement training to retain his skill in tasks learned in school. I think this group of people, and the OJT programs required to make them fully productive, are probably the main component of the OJT problem and the part of the problem that we can affect the most from the Washington level. But I am fully open to other views.

More specifically, I see the following tasks for each Service during the course of the study:

1. Confirm the existence or nonexistence of an OJT problem in the maintenance field and the nature, seriousness and effect on unit capabilities of the identified problem.

2. Identify resource constraints that contribute to the identified problem.

3. Identify alternative strategies to correct the identified problem and quantify the resources required to implement each strategy.

4. Select and recommend a comprehensive strategy to correct the identified problem.

In doing this work, we must consider not only solutions to current problems but also ways of coping with new problems that can be expected as new equipment items come on line.

At the July 16 meeting we can discuss the above matters, decide how to organize for the study effort and draft our plan for future work. Finally, I would like to make the point that this study effort is unlikely to produce anything useful without wholehearted cooperation by each Service and your personal attention. If we get this cooperation and the interest of senior members of each Service there is a strong potential for OSD support for such improvements as may be needed.

ALVIN TUCKER
Director
Training and Education

Enclosure

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS
(Program Management)

17 JUL 1980

MEMORANDUM FOR COL O. R. WHIDDEN, DAMO-TR, ARMY
CAPT JOHN LANGFORD, OP-114, NAVY
COL BARRY COLASSARD, CODE OTT, HQ MARINE CORPS
LTCOL BOBBY TINDELL, AF/MPPTS

SUBJECT: Phase I, OJT Study Task

This follows up on our meeting of 16 July and outlines the input we need from each Service to launch what we can call "Phase I" of the OJT study task -- i.e., definition of OJT and verification and identification of the OJT problem and its causes. This calls for two papers from each Service:

1. Definition of OJT as seen by each Service. There are obviously several different types of OJT going on in the Services; this will call, in most cases, for more than one definition. Each definition should include, for each type of OJT considered to be distinctive:

- *Training status of trainee at beginning of process.*

- Objectives and expected end product of OJT process -- e.g., bringing trainee to "journeyman" or other identifiable level of skill, such as full productivity in a given force structure job; teaching required skills not learned in school and/or reinforcing skills learned in school; qualification in an occupational specialty and/or on a particular piece or pieces of equipment; or others.

- Description of guides available on what to teach through OJT -- e.g., lists of skills taught in school and/or to be learned through OJT; job performance aids; local commander's discretion; etc.

- Identification of OJT instructors and methods of instruction -- e.g., dedicated instructors in structured training sessions; work-study under supervisors; learning by doing under supervisors; etc. This should include a description of any methods of documenting the progress of trainees.

These definitions should be general enough to apply to all or most skills. However, if there are variances from the norm associated with our skills of special interest (electronics and avionics maintenance and one other maintenance skill of your choice), please highlight these differences.

In listening to your descriptions of your OJT programs, I thought I heard a fairly standard definition of one type of OJT: that training required to teach graduates of initial skill training tasks not taught in school, and to sustain knowledge learned in school, with the objective of making these personnel effective performers in their first assigned jobs. If this definition is applicable to your Service, please include this type of OJT in the descriptions called for above. If there is, in fact, a considerable degree of commonality across Services in reliance on and conduct of this type of OJT, we may well want to concentrate most of our analytical efforts on it rather than trying to take in the universe of possible definitions of OJT.

2. Evaluation of OJT problems. This calls for a written evaluation -- objective if valid objective assessments are available, subjective if necessary -- of OJT programs as described in paragraph 1 above. This should include, for each type of OJT, concentrating on electronics, avionics and one other maintenance skill:

- An evaluation of problems, or shortfalls, in these programs that make them less than fully effective. This should include an estimate of the seriousness of each problem -- from negligible to catastrophic. If there are no problems and the programs are fully effective, this ends the discussion -- but I very strongly doubt if any of us have reached this stage of perfection.

- A listing and discussion, including an estimate of the extent, of the causes of the enumerated problems and shortfalls -- e.g., shortage of NCO's, weaknesses in qualifications of NCO's, lack of training literature, lack of command emphasis, lack of time because of operational demands, incomplete use of ISD to structure coherent training programs, etc.

  A special effort should be made to identify underlying causes that are not, in themselves, purely training problems, such as excessively complex equipment, unreliable test equipment, faulty design of maintenance systems, low-quality replacement personnel, etc.

We also need copies of any available studies, analyses, evaluations, etc., that are germane to the issue. It would also be helpful if you could give us samples of literature used to support OJT programs, such as Soldiers Manuals for electronics maintenance skills, etc.

I would like to have these products not later than 11 August. We will then distribute copies of all Services' inputs to each of you, give you some time to absorb them, and then meet to determine where we are and how to proceed with the next phase, identification of alternative strategies. I expect that many of these strategies will suggest themselves to you as you work through the problems and causes identified in Phase I.

I suggest you discuss the project among yourselves and with George Tilson (x50975) or Frank Hines (x56857) as work progresses to help keep us all moving in the same direction.

Alvin Tucker
Director for Training
and Education

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D C 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS
(Program Management)

22 August 1980

MEMORANDUM FOR COL O.R. WHIDDEN, DAMO-TR, ARMY
LCDR A.J. COMFORT, OP-114C, NAVY
COL B. COLASSARD, CODE OTT1, HQ MARINE CORPS
COL D.F. BRACKETT, AF/MPPT

SUBJECT: Phase II, OJT Study Task

I appreciate receiving your inputs on Phase I of the OJT Study Task, which define OJT as seen by each Service and identify problems in OJT and their causes. A full set of the Service inputs (advanced copies in the case of Army and Navy) are attached to help you to familiarize yourself with the practices and problems of the other Services.

We now need to move on to Phase II, the identification and provisional selection of alternative strategies to cope with the identified problems. I would hope that we could, while working on Phase II, do at least some preliminary work on Phase III (identification of costs and benefits of the alternative strategies), concentrating on the strategies that appear to be most cost effective.

To set this process in motion, I ask that you or your representative meet with me in my office (Room 3B930, Pentagon) at 1400, Thursday, 28 August. Please call George Tilson of my office (X50975) and let him know who will be attending the meeting.

Alvin Tucker
Director for Training
and Education

Attachments

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D C 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS
(Program Management)

03 SEP 1980

MEMORANDUM FOR COL H. R. O'NEIL, DAMO-TRI, ARMY
CAPT R. L. MADOUSE, OP-114F, NAVY
COL BARRY COLASSARD, CODE OTT, HQ MARINE CORPS
COL D. F. BRACKETT, AF/MPPT
LTC BIDGOOD, OASA(M&RA) (Info)
CDR MURPHY, OASN(MRA&L) (Info)

SUBJECT: Continuation of OJT Study Task

This memorandum follows up on our meeting on 28 August on the above subject.

Our next meeting will be in my office, room 3B930, at 1000 hours on Thursday, September 18. The following tasks should be undertaken before that meeting:

1. Completion and refinement, as necessary, of Phase I of the study. Phase I tasks are described in my memorandum of 17 July and include:

- Definition(s) of OJT as used in your Service.

- Listing and description of problems in administering effective OJT, including a discussion of the severity of the effects of the problems.

- Listing and description of causes of the problems.

- Providing this office copies of relevant Service OJT documents: regulations, OJT task listings in the maintenance skills of interest, etc.

2. Completion of Phase II, the identification of alternative strategies for solving or alleviating the problems. As I said at the meeting, I encourage the consideration of innovative strategies, including those which have not previously been tried or tested. In addition, the increased use of formal school training to teach some tasks now taught through OJT may be included in the alternatives if you consider it appropriate. No-cost alternatives should also be considered.

3. Begin work on Phase III, the identification of benefits and resource requirements (funds, manpower, equipment, etc., including yearly phasing) for

the more promising alternatives. In this connection, alternatives should be separately identified according to whether the required resources are (1) already programmed or budgeted, (2) not programmed or budgeted but attainable through relatively minor adjustments or additions, or (3) of such a nature as to require significant additions to existing programs or budgets.

Each Service should prepare an informal working paper showing progress since the 28 August meeting on the tasks listed above. These papers should be provided to the addressees above and to me, along with any relevant background papers, prior to the 18 September meeting or, if time is a problem, at the meeting.

At the 18 September meeting, we will discuss the following:

- The Service progress reports.

- Work on Phase IV, the comparative analysis of the alternative strategies and formulation of recommendations.

- Format for final Service reports.

As I said at the meeting, I now anticipate that the final report to ASD(MRA&L) will consist of reports from each Service as annexes and a covering report, which my office will prepare with your assistance, that will summarize findings gained through the Service reports and make appropriate recommendations. My plan is to complete the Service reports by November 3rd and to finalize the overall report by November 30, 1980.

Alvin Tucker
Director for Training
and Education

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

MANPOWER,
RESERVE AFFAIRS
AND LOGISTICS

(Program Management)

6 OCT 1980

MEMORANDUM FOR COL H. R. O'NEIL, DAMO-TRI, Army
CAPT R. L. MADOUSE, OP-114F, Navy
COL. BARRY COLASSARD, Code OTT, HQ USMC
COL. D. F. BRACKETT, AF/MPPT
LTC BIDGOOD, OASA(M&RA)(INFO)
CDR MURPHY, OASN(MRA&L)(INFO)

SUBJECT: Outline for OJT Study Task Reports

This memorandum follows up on our previous correspondence and meetings, most recently on 18 September, on the OJT Study Task.

As was discussed at our last meeting, the final product of the Study Task will include a report from each Service. These reports will serve as annexes to a covering report, prepared by my office, which will summarize findings gained through the Service reports and make appropriate recommendations. The due date to ASD(MRA&L) for the final report is 30 November. The due date to this office for Service reports is 3 November. To allow us to begin work on the final covering report (and to hedge against delays in Service staffing), I would appreciate it if you would provide us advanced copies informally as soon as your product is in reasonable shape.

Service reports should be in the general form of the Phase I-IV format we have been using in our preliminary work. I am not particularly concerned about having all Service reports in identical format; the important point is that all reports must contain the essential information needed to understand current programs, problems, possible solutions, and resource implications. Accordingly, I ask that you follow this outline reasonably closely:

Chapter I: Descriptions and Evaluation of Current OJT Programs.

- Description of various forms of OJT used in each Service.
- For each form of OJT:

--State of skill and knowledge of trainee at the beginning and end of the OJT period (i.e., the purpose of the program).

--Methods of determining tasks to be taught in OJT.

--Methods of instruction.

--Means of identifying and/or documenting progress.

- Evaluation of OJT programs.

--Identification of problems that interfere with program success.

--Estimate of the extent of the identified problems (quantified where possible) and the seriousness of each problem.

Chapter II: Strategies for Solving OJT Problems.

This Chapter should list and discuss alternative strategies for solving each of the identified problems. The selection of strategies for discussion should be a broad one, ranging from reforms already underway to innovative strategies that have not been tried or tested. The increased use of formal school training to teach tasks now taught through OJT may be included among other alternatives. It is also acceptable, when appropriate, to propose alternatives that involve research studies or pilot projects rather than full implementation if knowledge about an alternative is insufficient.

Chapter III: Alternative Strategies: Resources and Benefits.

This Chapter should include, for each alternative strategy of promise, the related costs and benefits.

- Costs: Resource requirements should be displayed in as much detail as possible. To the extent feasible, displays should show resources required by fiscal year, using a format as in the following example:

Alternative 2 Funding
($ Millions)

	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986	FY 1987
MilPers	-	1.3	1.7	1.7	1.7	1.7
O&M	0.2	2.0	2.1	2.1	2.1	2.1
Procurement	-	0.4	-	-	-	-
Total	0.2	3.7	3.8	3.8	3.8	3.8

Alternative 2 Manpower

Military	-	13	20	20	20	20
Civilian	-	4	4	4	4	4

Sufficient explanatory detail should be given to show the proposed use of the resources -- i.e., if procurement funding is involved, what items are to be procured, and for what use.

A clear distinction should be made among the alternatives to show which ones are:

- Already in the Service budget and/or FYDP.

- Not in budget or FYDP, but proposed for addition.

- Estimated for illustrative purposes, but not yet firm enough for a precise statement of resource requirements. This would apply, for example, to an innovative strategy still being worked out for possible inclusion in POM 83 or 84.

- Impossible to estimate even in gross terms, but worthy of further study.

No-cost alternatives (i.e., ones that are feasible within existing resources) should be included and so labeled.

- Benefits: While quantification of benefits is desirable, even if only in gross terms -- i.e., "this action will reduce time in OJT status by about one-third in most skills" -- many benefits will have to be stated in subjective terms. However, such statements must be as specific as possible in order to persuade the decisionmakers.

Chapter IV: Conclusions and Recommendations.

This Chapter should include a comparative analysis of the alternative strategies in terms of their costs and benefits. This should lead to conclusions recapitulating the Service views on the nature and severity of problems in OJT and the strategies that are most promising for curing the problems at acceptable cost. The recommendations should cover actions (i.e., resource adjustments) necessary for adopting the selected strategies.

It should be kept in mind that the focus of the OJT Study Task is on improving maintenance skills. Consequently, strategies and associated resource requirements should focus on improving maintenance OJT programs (and, if you think it appropriate, programs in specific maintenance skills such as electronics and avionics). However, if a Service believes that actions recommended for improving maintenance OJT are applicable to a wider spectrum of skills, or to all skills, there is no objection to including recommendations relative to the wider field as long as actions and resource requirements related to maintenance are separately identified.

As I mentioned at our last meeting, we will meet in my office (Room 3B930) at 1000, 15 October to discuss progress.

Alvin Tucker
Director for Training
and Education