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Bethesda, Maryland 20084

LEVEL II

NAVY TECHNICAL INFORMATION PRESENTATION SYSTEM (NTIPS) TEST AND IMPLEMENTATION STRATEGY

by

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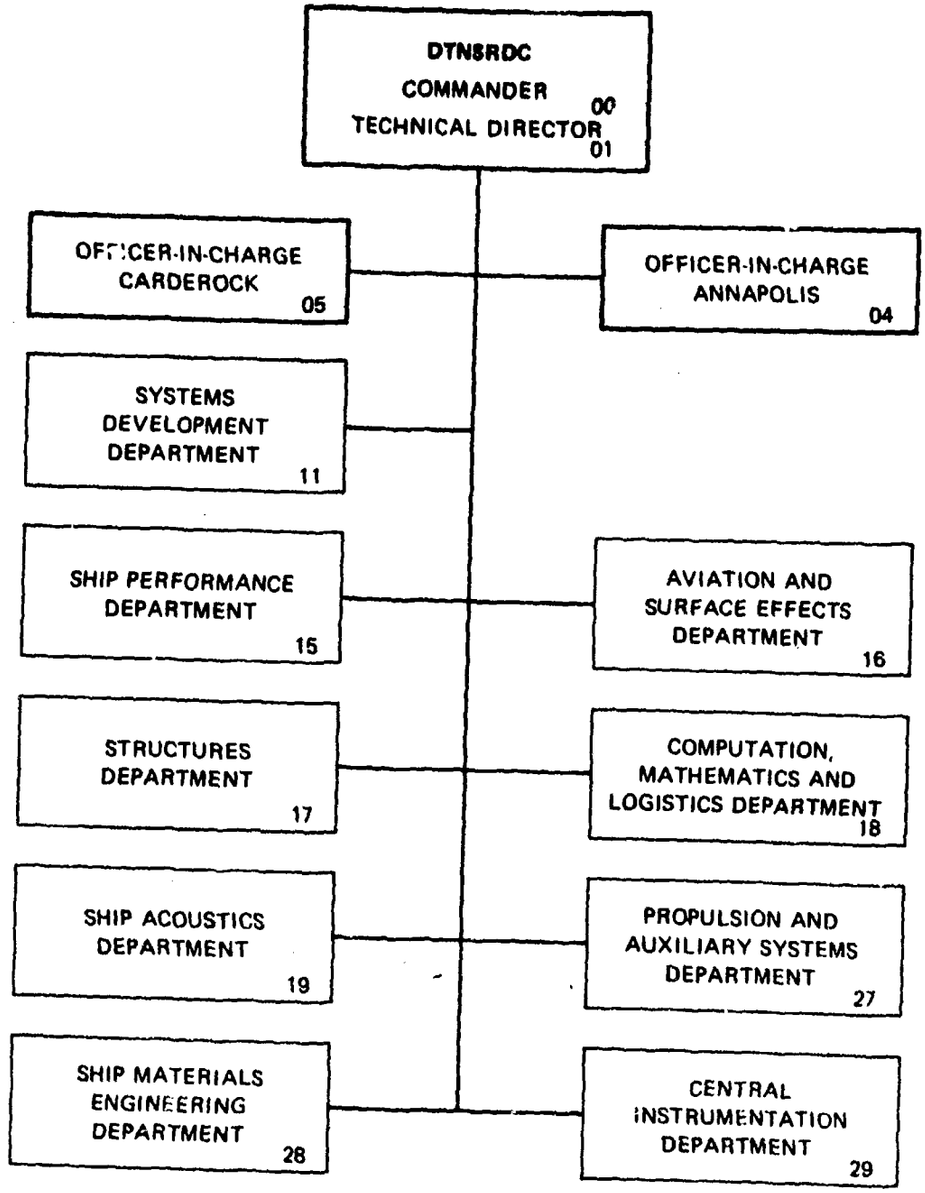

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This report describes the strategy for the test and implementation of a newly designed comprehensive Navy-wide system for the definition, acquisition, generation, mastering, replication, distribution, delivery, and control of all Technical Information (TI) secured by the Department of the Navy for delivery with military hardware and used for the purposes of

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ABSTRACT

This report describes the strategy for the test and implementation of a newly designed comprehensive Navy-wide system for the definition, acquisition, generation, mastering, replication, distribution, delivery, and control of all Technical Information (TI) secured by the Department of the Navy for delivery with military hardware and used for the purposes of system operation, training, maintenance, and logistics support. This system was conceived and designed as an R&D effort and will be tested, prototyped, and fully implemented in the operational Department of the Navy in the FY 82 - FY 88 time period as outlined in this report.

ADMINISTRATIVE INFORMATION

The NTIFS development effort is sponsored by OPNAV 401, under Program Element 63727N, Project Number W1032PN. The SYSCOM Program Manager is NAVAIR 340C. The Special Projects Office, DTNSRDC, Code 1803, is the technical agent.

1. NTIPS IMPLEMENTATION STRATEGY

1.0 INTRODUCTION -- GENERAL APPROACH

The Navy Technical Information Presentation Program (NTIPP) is a comprehensive developmental program which is attempting to solve all existing Technical Information (TI) problems for every part of the Navy. Technical Information is defined as all information bought with hardware systems for support of system operation, maintenance, and training or for logistics support. The final result of this R&D effort will be the proposed Navy Technical Information Presentation System (NTIPS), which will comprise all the procedures, organizations, and hardware and software systems to be used in the definition, acquisition, generation, mastering, replication, distribution, delivery, and control of Navy TI. It is also proposed to subsume all existing TI operations into NTIPS. Thus this future System will incorporate many established components in addition to newly designed subsystems.

1.1 NTIPS OUTPUT

The following partial list of products which NTIPP expects to deliver for eventual implementation highlights the wide scope of the developmental and implementation effort:

- Procedures for matching the TI to the user, which take into account personal characteristics of the user, the job tasks he must perform to support a given piece of hardware, work-environment considerations, maintenance philosophy, and training considerations

- Content, format, and style specifications describing new methods of presenting TI to Fleet maintenance and system-operating technicians

- Revised methods for defining and preparing TI for eventual delivery to the Navy which spell out new roles for contractors and Navy personnel

- Plans for restructuring the in-house Navy TI organizations to carry out new and revised roles

- Specifications for a Control System Information Function to facilitate the control of TI processes and of the actual TI inventory itself

- Plans and specifications for the use of state-of-the-art automated data-processing and document-processing equipment in the preparation and revision of TI

- Plans and specifications for the development of an entirely new capability for the use of electronic display media for the presentation of TI, including the construction of an initial prototype capability.

Implementing all these products in operational organizations, and at the same time incorporating these activities into a new NTIPS organizational structure, will require a formidable effort over a number of years. Typical approaches to implementing a large-scale system of hardware components cannot be applied to the entire NTIP System (although such approaches may apply to major subsystems, such as the automated TI production system).

To carry out the implementation of NTIPS in an orderly and feasible manner, seven separate implementation streams have been identified and the implementation process itself has been planned in three phases covering a seven-year period. The implementation streams are described in Section II of this report. Section III gives the planned scenario for the implementation of each phase and program stream.

1.2 GUIDELINES FOR IMPLEMENTATION

Implicit in this overall implementation strategy are the following basic guidelines which were adhered to in the development of the plan:

1. High-level decisions on NTIPS implementation will involve choices of approaches for the most effective phasing-in of NTIPS increments, rather than whether or not to implement the entire System. Thus certain concepts, originally generated under NTIPP are already being implemented. NTIPS is not a single system in the sense that a single go/no-go implementation decision could be applied, but

rather represents scores of proposed changes in procedures, organization, and technology. If, for whatever reason, some functions of the NTIPP design components are rejected as unaffordable or undesirable, the remaining components will then constitute "the NTIPS" to be implemented.

2. The implementation process requires cooperation of the designer, the implementation authority, and the system operators and users throughout the implementation process. This differs from the usual system implementation process in which:

a. A system design is firmed and submitted to the implementation authority.
b. The implementation authority approves (or disapproves) the design and issues the appropriate directives.
c. The system is implemented by the users as instructed with only minimal assistance from the original designers.

Key reasons for the inclusion of the system designers as full partners in the proposed NTIPS implementation procedures are as follows:

a. The range of NTIP System operators and users will be so wide (e.g., the Fleet and Squadrons, Naval support activities, Federal acquisition-policy makers, industry suppliers, printing and publishing contractors, and technology-approval committees) that some parties will consider themselves justified in delaying, modifying, and/or protesting specific details of any approved implementation plan regardless of who might approve such a plan (e.g., the printing industry and aerospace industries could appeal to Congress; the Fleet could protest through operational channels; equipment-approval authorities could cite Congressional mandates and delay implementation).

b. The ability to make appropriate design revisions to meet new requirements of operators or users must be maintained during the implementation process. Some implementation phasing decisions could also involve design decisions (e.g., the removal of key components from a proposed implementation stage); thus a design review could well be

required upon, or after, approval. The overall NTIPS design is so complex and interrelated that only the parties intimately involved in the original design process (i.e., the NTIPP Office and its contractors and Navy associates) would be in a satisfactory position to perform the necessary design review and revision in a timely manner.

c. The effects of implementation decisions requiring significant changes in the organizational structure of the Department of the Navy and the manner in which the new organization will interface with industry will be extremely difficult to predict before implementation. Subsequent minor changes in these relationships are expected; they will require revision of the NTIPS design itself and also of the NTIPS implementation plan, after implementation has been partially carried out. A critical implication of this factor is that the NTIPP Office (and possibly key contractors) must be retained throughout all implementation phases.

3. Implementation will be phased. As envisioned, NTIPS is of such magnitude that any other approach is not tenable. This phasing applies to all NTIPS functions and proposed organizations. Phasing-in will also be required for the volume of documents in the NTIPS-managed workload. The target date for full promulgation of all NTIPS operating instructions is early in Phase V; however, full operational capability in conformance with these instructions will likely not be feasible until the end of that phase.

4. Implementation procedures will be planned so that gaps in time between stages of implementation do not occur. If an implementation stage is delayed (e.g., a missed procurement deadline or a slow approval delays delivery of a key production-system component or service), the preceding stage must extend the services provided under the prior implementation stage for the required additional period of time. (For example, a two-year contract for automated-production services under Phase IV would be written with an option to extend one or two years into Phase V if the follow-up contracts were delayed.)

5. As NTIPS is implemented, the new approaches to procurement and control of TI will be applied to new-system acquisitions. However, the NTIP System must

retain the capability to revise and update existing TI according to the procedures, specifications, and standards that were in effect when the TI was first developed.

6. Backfitting (updating of existing TI, or TI procedures, to NTIPS methodology) will be restricted to that necessary so that existing TI can complement new TI when required in a Fleet setting. There are two major cases in which such backfitting might be required: (1) a new or modified weapon system incorporates existing equipments furnished as GFE for which the associated GFI version of the TI requires conversion to the same presentation mode as the new NTIPS prepared TI material; and (2) all the TI for a specified work center needs to be presented in the same display system to permit a unified approach to system maintenance.

7. Establishment of the NTIPS organization will be based on changes to existing organizations. In this approach, the principal organizations affected (i.e., NSDSA, NATSF) will initially designate key persons on their current staffs to form the NTIPS core or cadre. In addition to performing prototype NTIPS duties, this core group, working with the top management of their parent organizations, will arrange to incorporate, in stages, increasingly more personnel into the NTIPS organization until the two parent organizations cited are completely reorganized to constitute the NTIPS organization.

1.3 OUTLINE OF THE REMAINDER OF THE REPORT

The remaining sections of this report

a. describe the seven streams of implementation
b. define the three implementation phases
c. summarize the activities to be undertaken for each of the 21 (3 x 7) stream/phase categories.

2. IMPLEMENTATION PHASES AND PROGRAM STREAMS

Because of the breadth of the NTIPP charter and the variety of its outputs, separate implementation processes will be initiated for five major groupings of NTIPS components. These five major NTIPS element groupings, for which separate implementation strategies have been established, are identified as Streams 1 through 5 of the NTIP Program plan.

(1) Procedures - This Stream involves the processes for defining, generating, and controlling TI and for operating under the new NTIP System. In general, these new procedures will be specified in formal instructions, specifications, and military standards.

(2) Organization Revisions - This Stream involves the creation of a new centralized NTIPS organization, incorporating the existing TI-related organizations and activities currently operating in the Navy Department. Personnel requirements and position descriptions will also be developed.

(3) Control Information Systems - This Stream involves the design, specification, creation or revision, and data-loading of the data systems (i.e., management information systems) containing information about the TI needed for control of the TI acquisition, indexing, distribution, update, and management processes.

(4) Automated TI Production System - This Stream involves the establishment of a system for automating the TI production process from authoring and extraction of data from engineering data bases, through conversion of data into an NTIPS standard format, preparation of the reproducible masters, replication, and finally to distribution of the TI. This level also includes the development and operation of the master TI archives.

(5) Electronic Display System - This Stream includes all aspects involved in the introduction of new electronic display media and the associated information presentation technology into the Fleet, including all the support infrastructure and the development of the required presentation formats.

Separate implementation strategies for each of these program streams constitute the total NTIPS Implementation Plan. These strategies are summarized in Figure 1. Interfaces among the streams are, of course, necessary, but those interdependencies do not preclude separate implementation. In addition to the NTIPS line-process streams, two other program streams for system training and program management are required.

NTIPS implementation will be carried out under the direction of a NAVMAT Project Office, either in NAVMAT 042 or as a designated Program Manager. The NTIP Program Office at DTNSRDC will work closely with this Project Office during the implementation process and will be responsible for continuing evaluation and refinement of the NTIPS design. The NTIPP Office (designated NTIPS Stream P in this summary), under the Project Officer's direction, will also initiate a prototype operation. The P-Stream effort, for which appropriate resources are required, will provide assistance to, and monitoring of, the overall implementation process and will also participate in budgeting, training, and explaining the overall program to higher authority.

An extensive training program will be required in order to prepare NTIP System Operators, TI Content Generators (i.e., contractors), Navy hardware System Acquisition Managers, and Fleet TI users for the implementation of NTIPS components. The plans and tasks of this training program will be managed under NTIP Implementation Stream P.

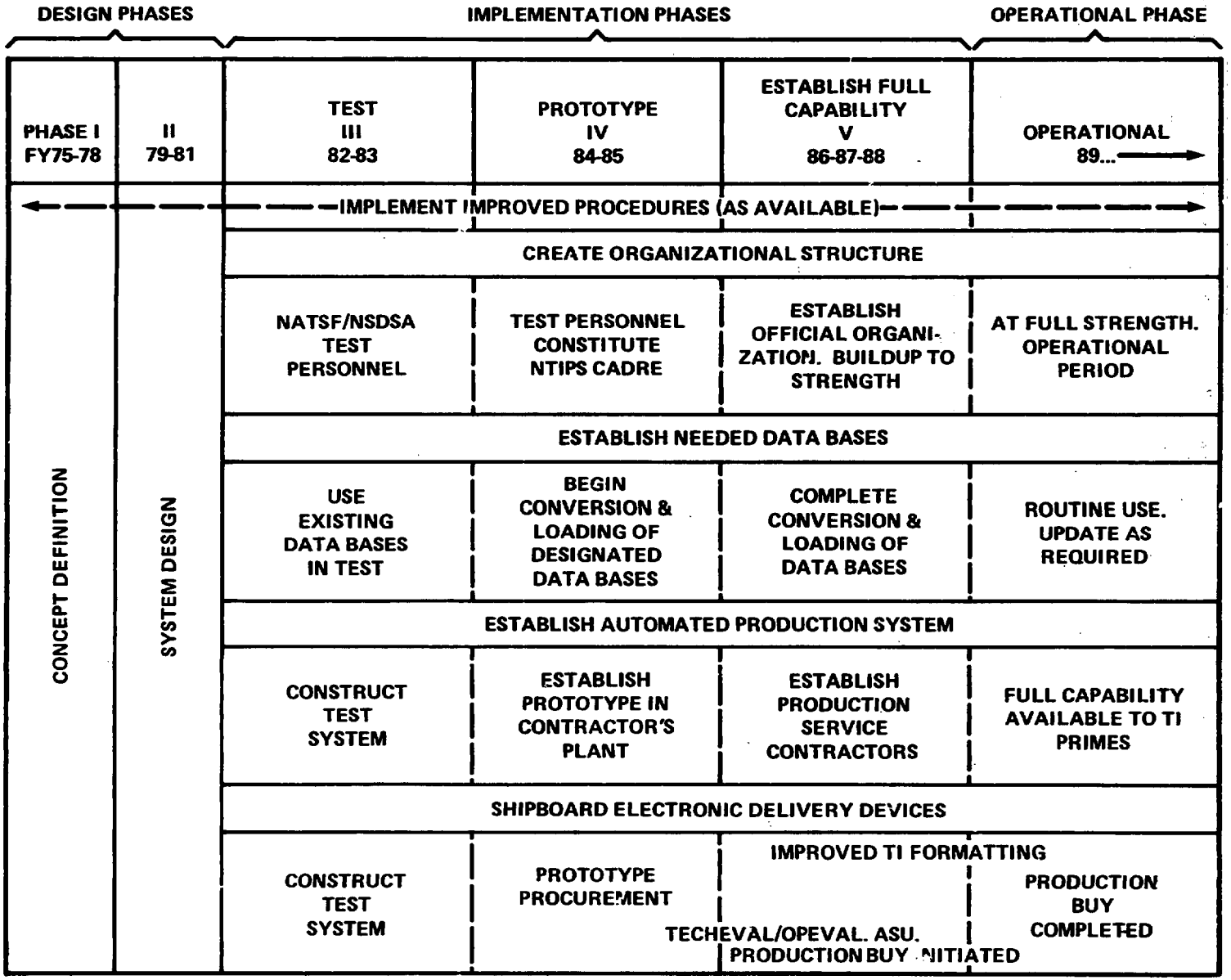


Figure 1 - NTIPS Implementation Overview

3. SUMMARY OF IMPLEMENTATION PLANNING FOR NTIPS BY PHASE AND PROGRAM STREAM

Once the System design is completed (Phase II, December 1981), further NTIPP effort will involve:

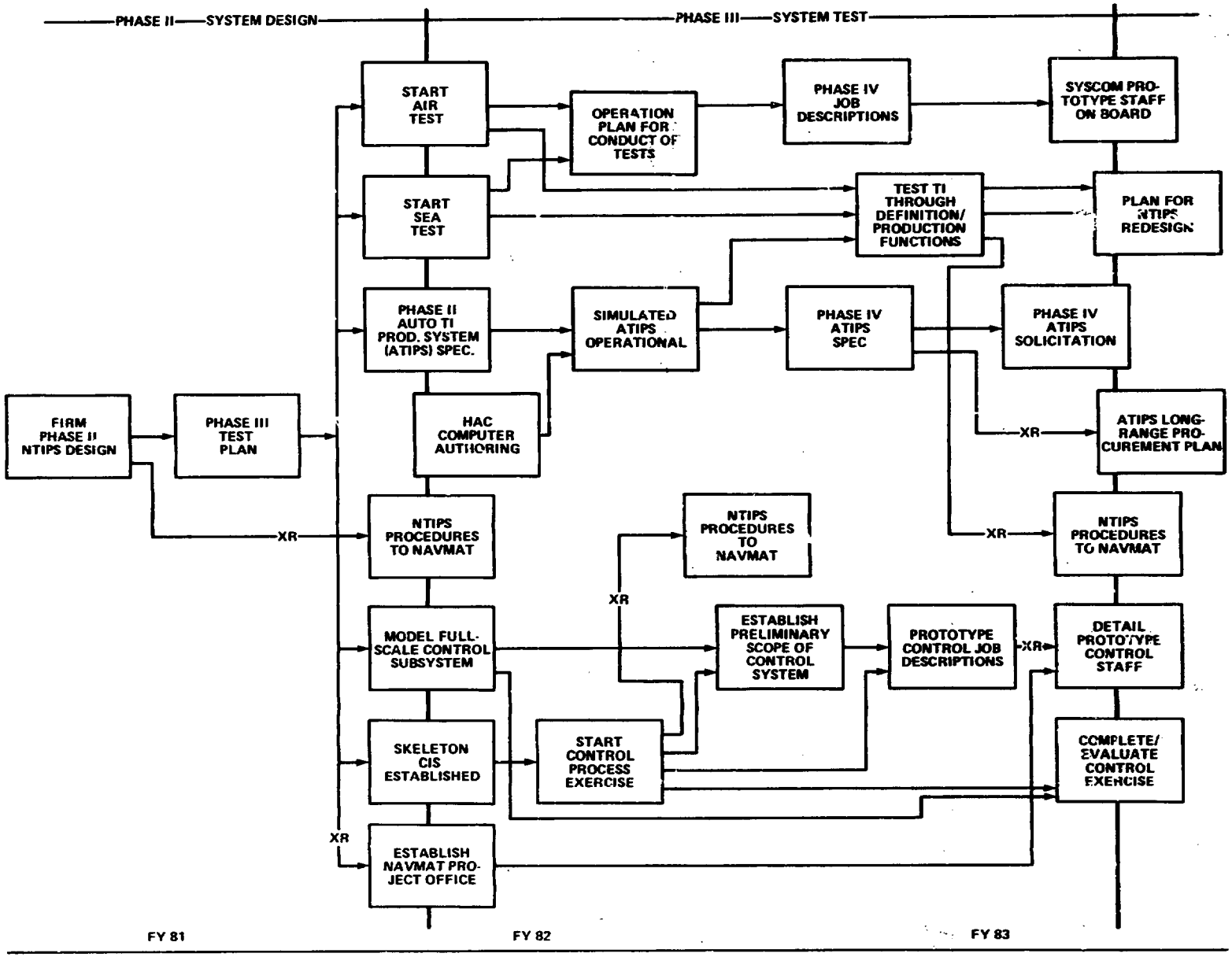
Phase III - Systems Test (FY 82, 83)
Phase IV - Prototype Implementation (FY 84, 85)
Phase V - Establish Full Capability (FY 86, 87, 88)

Full-scale operation is scheduled for FY 89, at which time NTIPS will have subsumed all current TI management activities. Seven Program Implementation Streams are involved in each phase of the Program Plan. Streams 1-5 involve NTIPS elements, and Streams P and T involve managing and training for the implementation itself.

P - NTIP Program Office (RDT&E)
T - NTIP System Training
1 - Procedures
2 - Organization
3 - Control Information System
4 - Automated TI Production System
5 - Electronic Display System

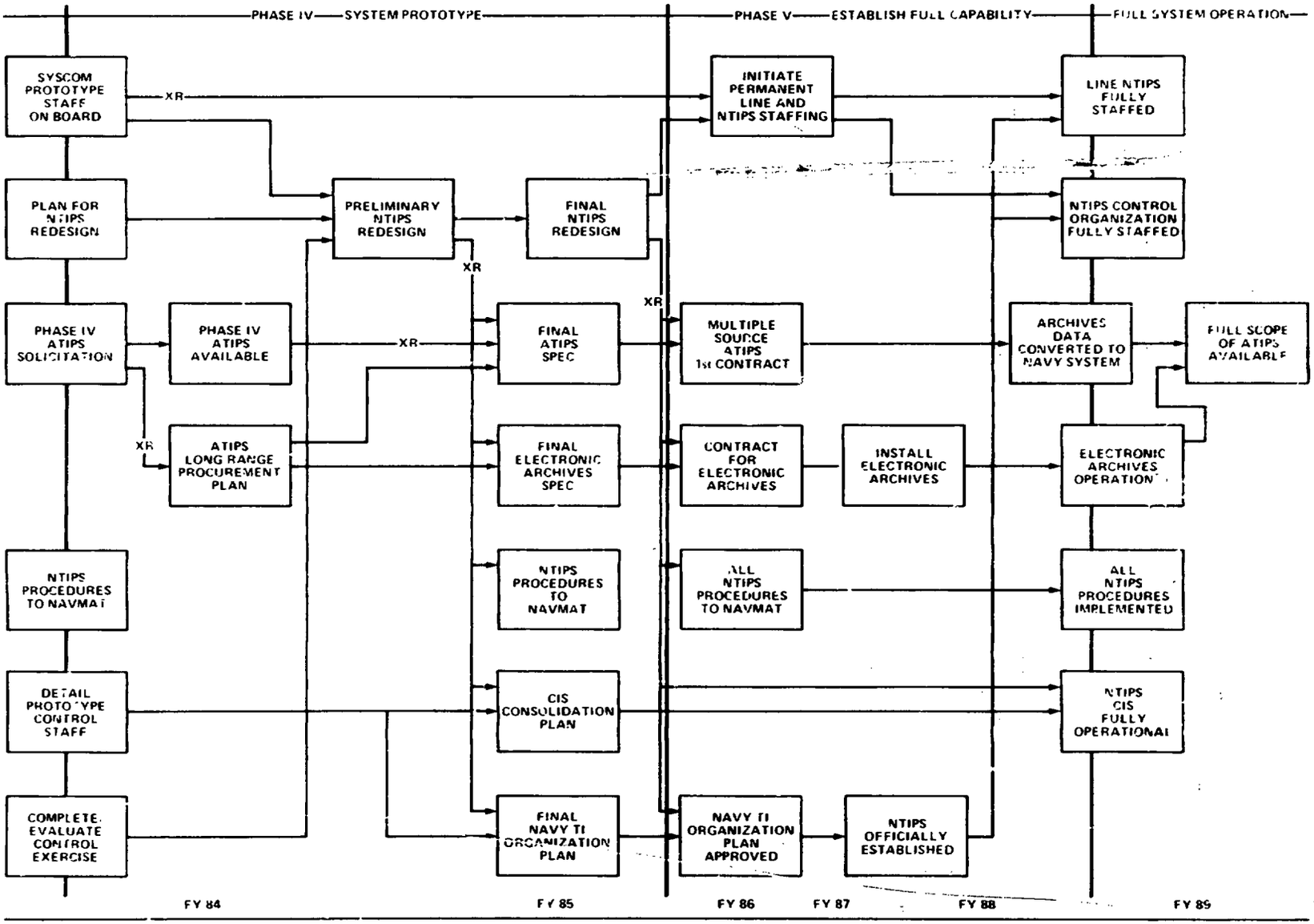
Presented in the following pages are summaries of the key aspects of the implementation process for each of the 21 Phase/Stream implementation actions. They are presented Phase by Phase; i.e., all Streams of activity for the System Test Phase (Phase III) are presented, then those of the Prototype Implementation Phase, and so on.

Figures 2-5 are a series of PERT charts showing the key events in Streams 1-5 during Phases III, IV, and V.



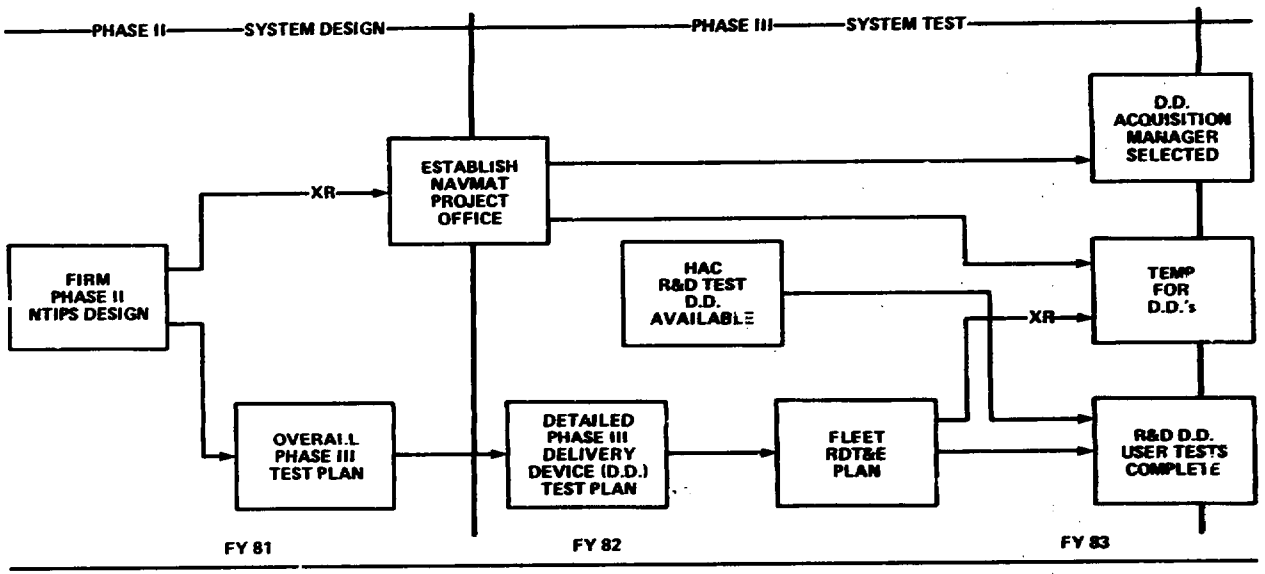
XR - Transition out of R&D

Figure 2 - Key Events for NTIPS Implementation (Streams 1-4, Phases II and III)



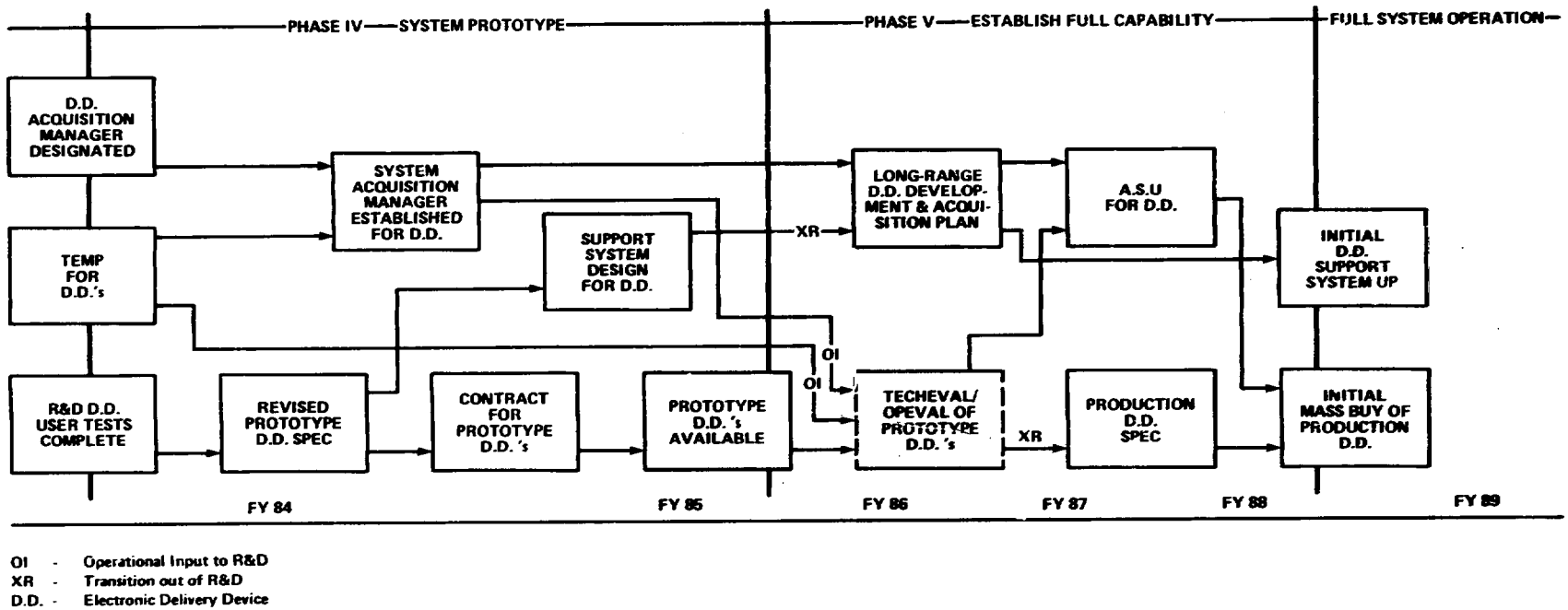
XR Transition out of R&D

Figure 3 - Key Events for NTIPS Implementation (Streams 1-4, Phases IV and V)



XR = Transition out of R&D
D.D. = Electronic Delivery Device

Figure 4 - Key Events for NTIPS Implementation (Stream 5, Phases II and III)



OI - Operational Input to R&D
XR - Transition out of R&D
D.D. - Electronic Delivery Device

Figure 5 - Key Events for NTIPS Implementation (Stream 5, Phases IV and V)

Phase III/Stream P

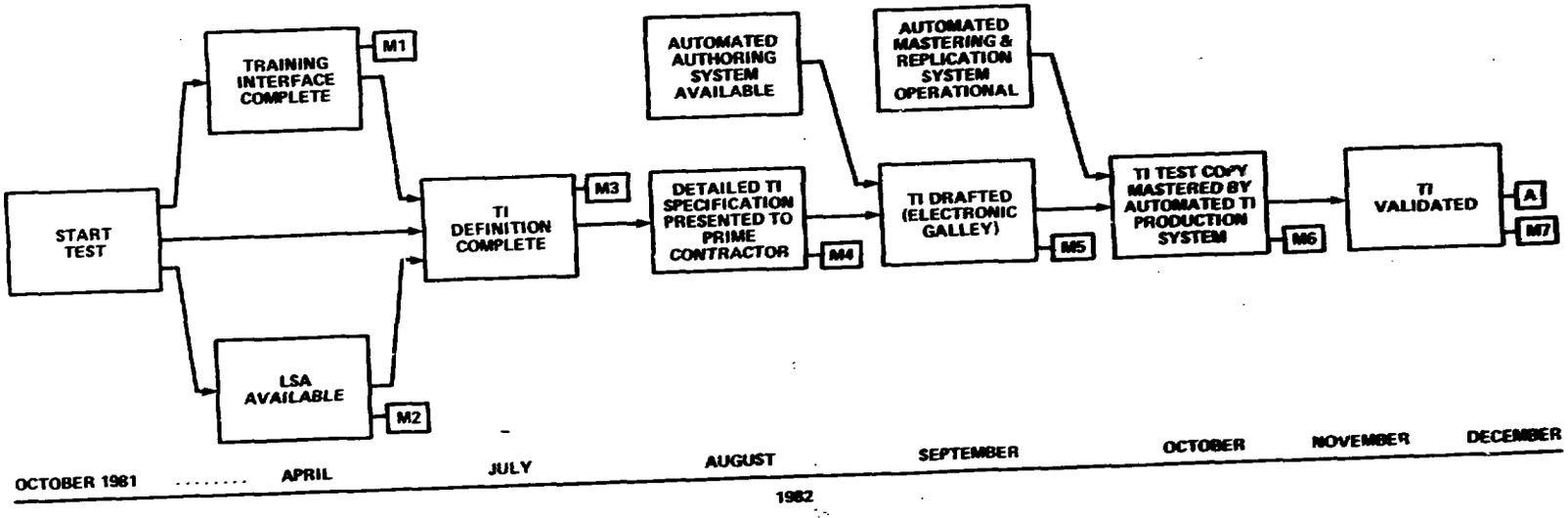
NTIP Program Office Role During the Test Phase (FY 82-FY 83)

The NTIPP Office will conduct the overall Systems Test of NTIPS during the Phase III period. Figures 6 and 7 are charts depicting the key events planned for this Phase. In addition to functioning as the overall control activity, the Program Office will secure disinterested evaluation of the test results and will modify the NTIP System design as required to incorporate changes indicated by results of the test. Some portions of the Control Subsystem will not be tested because of the low volume of TI being processed, and the Program Office will conduct a study to model and evaluate these functions.

The Program Office will perform overall program management, provide necessary briefings, satisfy reporting requirements, and provide all planning for the NTIPS implementation through FY 88. It will simulate any higher-level Control System functions not performed by the actual test staffs, which are necessary to complete the Test Phase. The Program Office will designate a test manager who will monitor tests and assemble and evaluate test results for publication. It will work with the NAVMAT Project Office (when designated) to establish a formal NAVMAT/NTIPP liaison function during Phase III, so that lessons learned can be taken into account early in the implementation process. Selected support and instructional services will be secured from the Phase II prime contractor as required during the Phase III test.

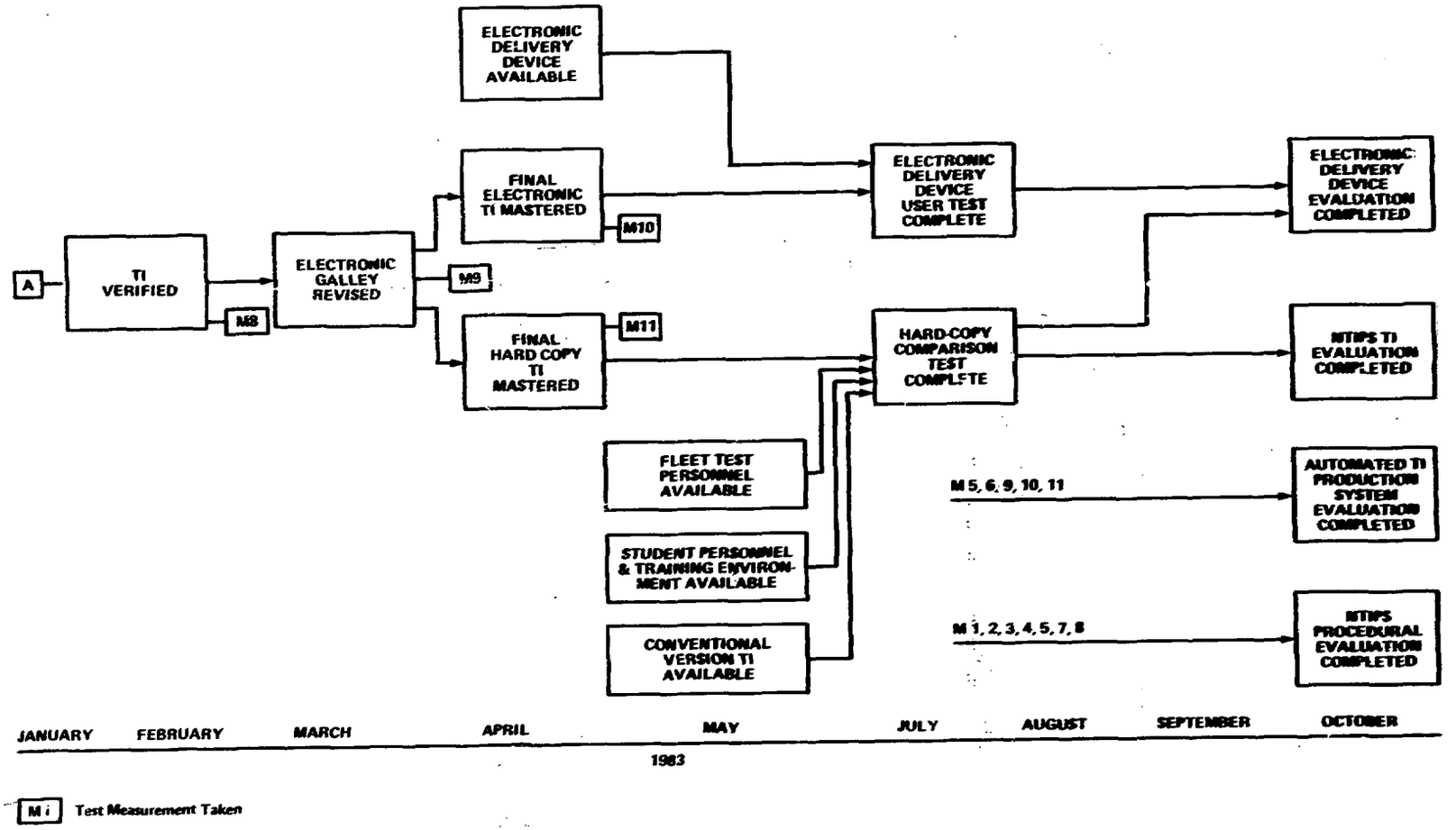
The NTIPP Office will continue to interpret and justify all aspects of the program, as required, to higher authority. During this period, several formal briefings, possibly on videotape, will be prepared to meet the expected requirement for frequent presentations. The NTIPP Office will also continue to budget for all NTIPS operations through the end of Phase V.

Figure 6 - Events During Phase III Test



NOTE: There will be separate tests for NAVSEA and NAVAIR

Figure 6 (Continued)



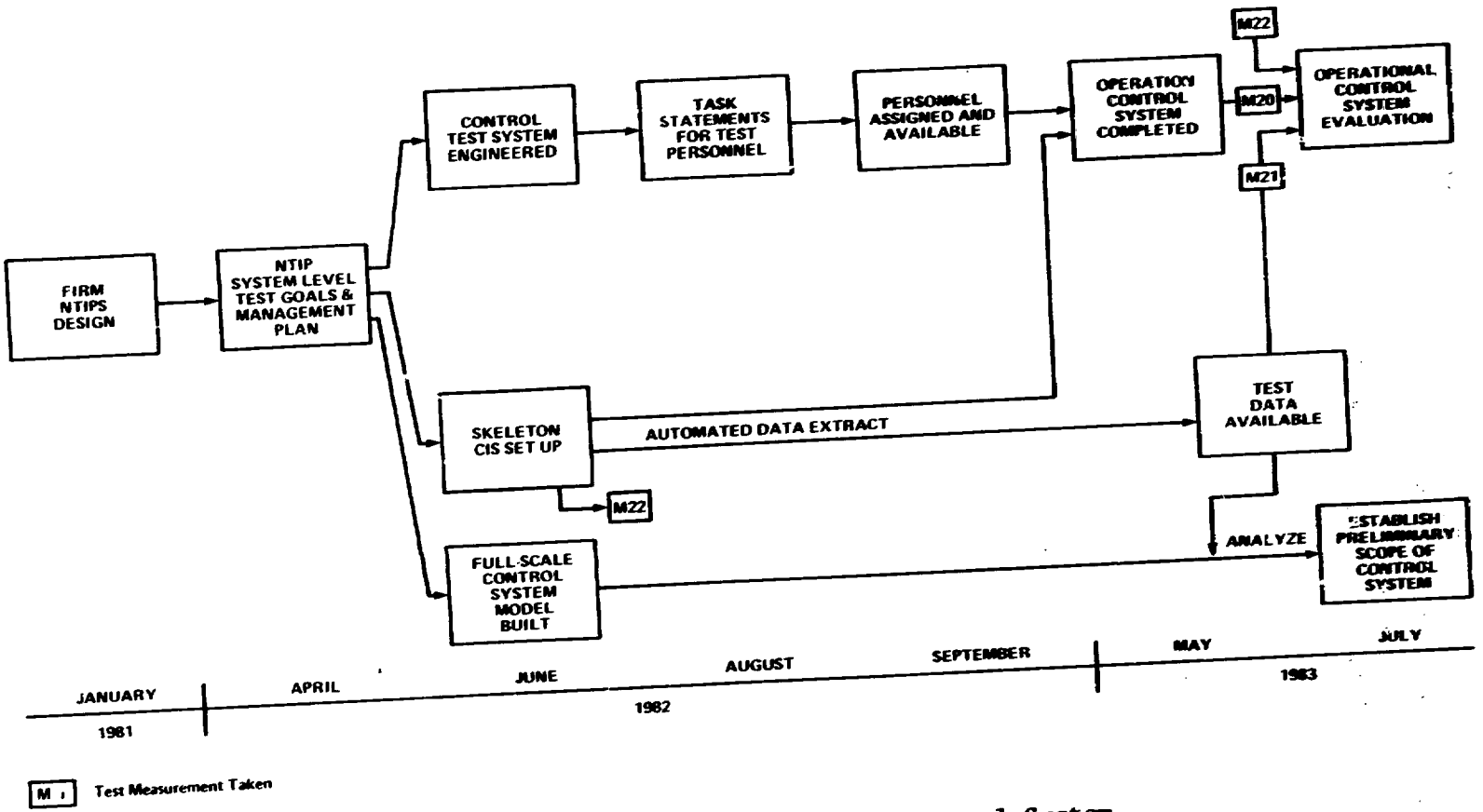


Figure 7 - Key Events to Test NTIPS Control System

Phase III/Stream T

System Training - Test Phase

The NTIP Program Office will be responsible for the training and indoctrination of the NTIPS operators and users during the Test Phase. Contractor support to perform the training will be required. The specific training will be given to the following categories of personnel:

1. The two test teams of up to six people each from NAVAIR (NATSF), NAVSEA (NSDSA), and the NAVMAT-designated program office will be given an overview of the entire NTIP System and detailed instruction in the NTIPS functions which they will perform during the test. An initial two weeks of training will be given to these personnel.

2. Personnel of the TI Generation Contractor will also require training in the functions which they are to perform. Tailored instruction will be provided for specific test situations in addition to the general NTIPS overview given to Navy personnel. Special emphasis will be given to users of the automated authoring terminals.

3. Specific training will be provided to those Fleet or Squadron personnel used as test subjects for evaluation of the TI generated during Phase III. This training will include coverage of any new media, information-location systems, and deficiency reporting procedures.

4. A general NTIPS overview will be prepared for indoctrinating Navy personnel who will eventually be affected by NTIPS but who will not be officially part of the Phase III test team. These personnel will include the supervisors of organizations providing the test-team staff. This training will serve two basic purposes:

- Prepare them for subsequent NTIPS implementation phases, and
- Solicit comments, evaluations, and recommendations on the future NTIPS and the proposed implementation strategy.

At the end of Phase III, a plan will be developed for the Phase IV training. The most extensive effort during that Phase will be for the training of the Prototype Organization staff, consisting of about 35 people. Some of this training will commence in Phase III, provided the prototype personnel can be identified before Phase IV starts.

The NTIP Program Office will also initiate the development of a long-range training plan and the associated budgeting process in order to insure that training resources are available for Phase V when several hundred new people (system operators) will require training.

Phase III/Stream 1

Procedures - Test Phase

Draft Instructions prepared in Phase II will be tested in this phase and initial detailed evaluations completed. Issuance of procedures designed to improve Navy TI practices, however, may start even before the commencement of Phase III, after circulation by NAVMAT for comment among the SYSCOMs. Promulgation of those procedures which require the context of an existing NTIP System cannot, of course, start until the system design has been finalized early in Phase IV.

Procedures which can be put into effect without an operational NTIPS organization will be evaluated, revised for immediate implementation, and forwarded to NAVMAT 042 in final draft specification/standard form for processing. See Figure 8 for the key Phase III events. These will, in general, specify modifications in the manner in which TI acquisition managers or TI generators (contractors) operate in the acquisition and generation of TI and will not require the services of the newly defined NTIPS organization. They will thus be of a type to cause existing Navy TI organizations to change their current mode of operation so as to employ the new/revised procedures in their ongoing TI acquisition or generation actions.

The NTIPP Office will prepare drafts of the recommended changes to existing Navy instructions which will be required to specify the use of the new procedures.

The specific improved procedures to be considered for implementation before establishment of the NTIPS organization in the full-capability mode (Phase V) include the following specifications/standards:

- Improved Quality Assurance Procedures
- Improved Comprehensibility Measures (Including Format and Style)
- Modifications to existing LSA Procedures
- Improved Medium Specifications
- Improved Content, Format, and Style Specifications (Modular Specifications)

- Improved Pricing Procedures
- TI Writer Qualifications
- An Improved Cross-Referencing and Numbering System
- Improved Verification Procedures

The following procedural specifications/standards are, at least to some extent, dependent on the specific design of NTIPS subsystems, data files, or electronic-display capabilities and will be tested but not finalized in this phase:

- Source Data Modifications for Improved Utility in TI Preparation
- Configuration Accounting Procedures
- User/TI Match Procedures
- Medium Specification for Electronic Media
- Content Specification of TI for Electronic Display
- Automated Authoring Specification
- Automated TI Production-System Specifications
- Archives-Operation Specification
- All Other Procedures Relating Specifically to Electronic Display

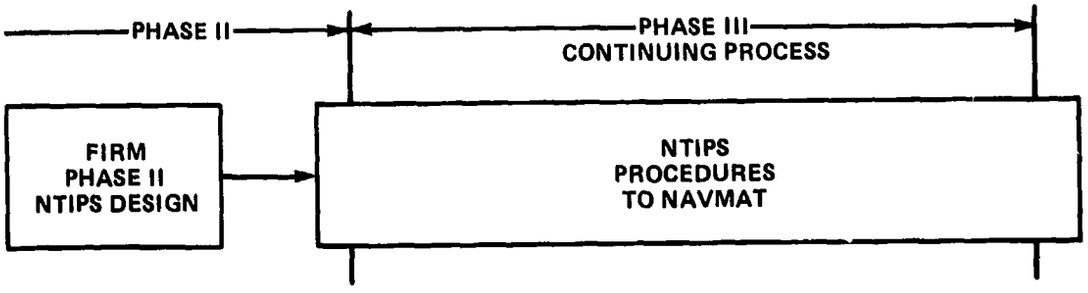


Figure 8 - Procedures, Phase III Events

Phase III/Stream 2

Organization - Test Phase

The existing Navy organizations devoted primarily to acquisition and control of TI (NATSF, NSDSA) will designate onboard staff members to be part of the NTIPS test team for the two-year test period. Using NTIPS procedures, they will supervise the definition and generation of a TI subset for the selected hardware systems. The NTIPS test team will consist of three to six persons each from NSDSA and NATSF. The test will be under the control of the NTIPP Office as currently constituted and will be coordinated with the NAVMAT Project Office. The NTIPP Office will function as the NTIPS Control System during Phase III. It is expected that most of the test personnel will be occupied only part time for most of the two-year period. No official detailing of personnel to new assignments would occur until Phase IV. It is, however, expected that this test team, augmented by a control group who would be designated by the NAVMAT Project Office, would serve as the core of the Phase IV prototype organization. See Figure 9 for key Phase III events. To effect a smooth transition to Phase IV, the number of personnel allocated to this organization would be increased in the last few months of Phase III.

The primary duties of this test team will be: (1) to apply the NTIPS operating procedures to the acquisition, development, and use of the TI on the selected hardware systems (one NAVAIR system and two NAVSEA systems) during the Phase III test; (2) to support the analysis and evaluation of the test results; and (3) to recommend modifications to the NTIPS design as indicated by the test results. The test team will also prepare for the addition of more staff to the prototype organization to be set up in Phase IV. SYSCOM personnel assigned to this team will require appropriate expertise in procurement, TI defnition, and Quality-Assurance.

The NTIPP Office will develop job descriptions for a prototype control organization based on Phase III experience and on a control-system sizing study undertaken during this phase.

Members of the test team will work within the context of their parent organizations and will thus provide these organizations with an opportunity to observe and evaluate the approaches recommended for NTIPS. Such an arrangement will provide the existing TI activities of the Navy with an early detailed interaction with NTIPS and will allow them an early opportunity to provide recommendations to improve the structure of the future NTIPS organization and to optimize NTIPS procedures. NAVMAT will be ultimately responsible for determining the details of the structure of the Phase IV NTIPS Prototype Organization. This effort will be closely coordinated with the NTIPP Office, and will be monitored by the SYSCOM NTIPS Advisory Committee, under the Navy TM Management Policy Council (TMMPC).

The set of instructions that specifies actual NTIPS operations will be revised whenever improvements are appropriate until the official NTIPS Organization Plan is submitted for approval late in Phase IV. Draft versions of those procedures, required to describe the duties and responsibilities of the prototype staff (in Phase IV), will be prepared by the NTIP Program Office in coordination with the NAVAIR, NAVSEA, and NAVMAT TI activities participating in the tests. These preliminary directives will serve as the "charter" of the NTIPS Prototype Organization. The functions they describe may thus be only a subset of the eventual full-function NTIPS instructions.

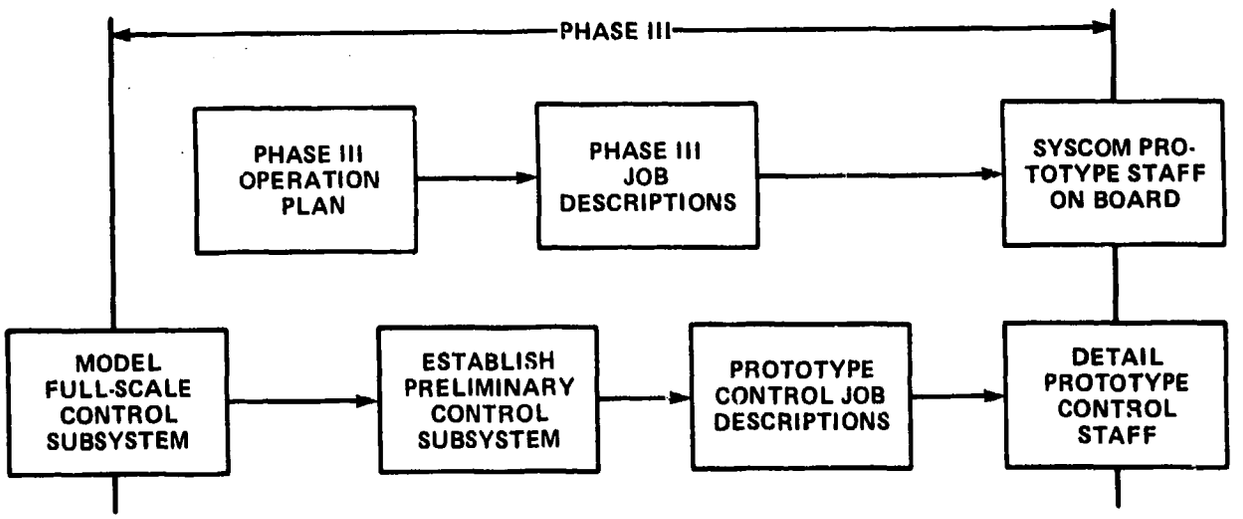


Figure 9 - Organization, Phase III Events

Phase III/Stream 3

Control System Information Function (CSIF) Test Phase

Phase II will have identified in general terms the Control System Information Function (CSIF) Data Bases, defined the required structure of the files, and outlined a plan to convert existing data files into the required CSIF form. While Phases II and III are taking place, the SYSCOMs will be conducting other ad hoc efforts to improve the existing information system. The NTIPS design effort will not duplicate these efforts.

The principal data bases for the complete CSIF are currently envisioned as follows:

- NTIPS Operating Policies and Procedures
- TI Configuration Control
- TIDER
- TI Development Status (Schedules, Budgets)
- Specifications
- Historical (Cost, Scope, Inactive Programs)
- Quality Assurance
- Cost Estimating
- Contract

Two major NTIPP efforts involving the CSIF will occur during Phase III:

(1) A special set of CSIF files will be built and maintained for the test TI only. Data formats of these files will be in final design form, but the processing will be simulated, since final CSIF software will not be available at the start of Phase III. See Figure 10 for the relation of setting up these files to the control process exercise of Phase III.

(2) The two-year Phase III test period will be used to coordinate the ad hoc (non-NTIPP) data-system efforts and the NTIPS CSIF design, so that by the end of the test period all Navy efforts in this area will be directed toward

compatibility with NTIPS. It is expected that the present TI control management information systems (e.g., the STEPS system of NSDSA) may serve NTIPS purposes with relatively minor changes.

Loading of the CSIF files according to NTIPS standards will not start until Phase IV, although appropriate planning efforts for file-loading will commence during Phase III to assure a smooth transition in this area.

As much of the final CSIF software as possible must be identified early in Phase IV; modification of existing Data Base Management System (DBMS) procedures to accomplish NTIPS purposes will be carried out whenever feasible.

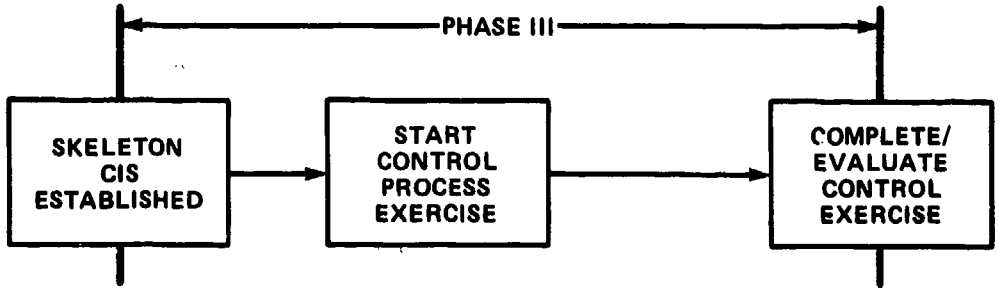


Figure 10 - CIS, Phase III Events

Phase III/Stream 4

Automated TI Production System - Test Phase

The objective of this effort will be to test the TI automated production-system design by performing all the TI authoring and mastering functions in sufficient depth to demonstrate that the system will function as designed. In general, this will be accomplished by supplementing existing equipment owned and operated by an organization currently in the automated-publications business in a manner which will accurately simulate the NTIPS-specified functions. Computer programs to perform basic computer-assisted authoring have been contracted for in Phase II and will be ready for use in Phase III. The NTIPP Office will be responsible for system integration, beginning with the introduction of engineering data into the automated system (i.e., digitizing relevant text and graphics), going on into authoring, and continuing through replication. Figure 11 shows the key events for the Phase III program.

Performance of this simulated operation will be evaluated. A detailed specification will be prepared for the design and assembly of a prototype production system to be utilized in Phase IV. Should procurement of the Phase IV prototype system require an inordinate amount of time, it will be desirable to extend the arrangements for the Phase III simulated and breadboarded system capabilities, so that during Phase IV actual TI source material can be processed through the authoring and medium-specific mastering steps, until the (Prototype) Phase IV capability is under contract and available.

A special effort will be undertaken to finalize all data format specifications to assure the optimum compatibility of material to be processed on the Automated TI Production System, which will be secured in Phases IV and V. This will require an evaluation, and possibly a revision and expansion, of the specific data formats and file architectures recommended in Phase II.

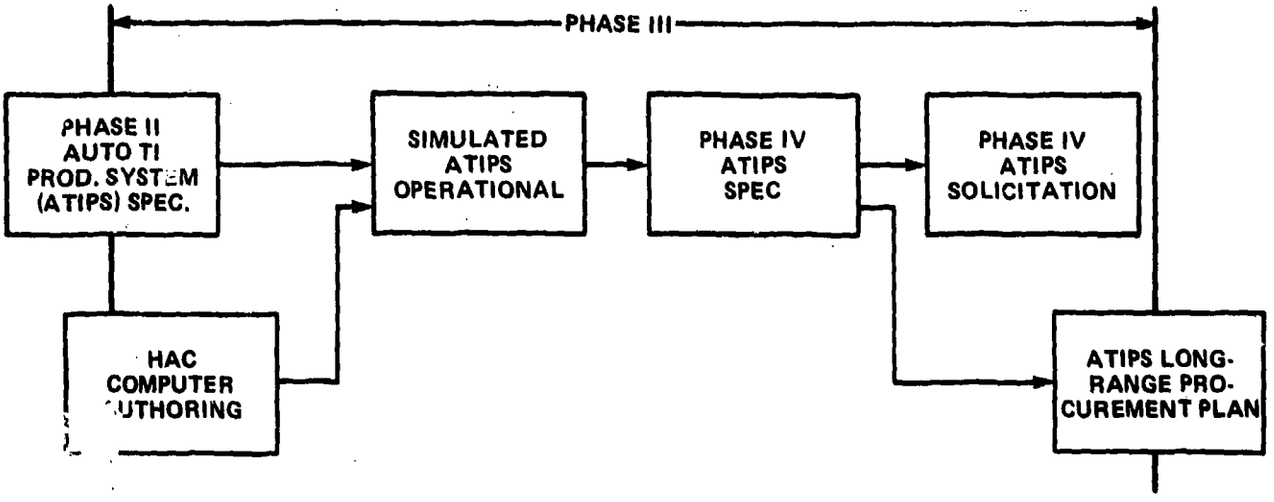


Figure 11 - ATIPS, Phase III Events

Phase III/Stream 5

Electronic Display System - Test Phase

During the Phase II effort, a breadboard prototype electronic delivery device was contracted for, to be delivered in time for use during Phase III. The development of an authoring capability was also contracted for during Phase II so that it would be available for testing during Phase III. This authoring capability, interfaced to the automated TI production capability (Stream 4), will be used to prepare selected TI for test in an operational setting, using the electronic delivery display device. Figure 12 shows key events for the Phase III test of the electronic display system.

With only one delivery device available, the tests during this phase will, of necessity, be limited. Much of the effort will be oriented toward obtaining the widest exposure possible of the test device to personnel of the type who will eventually be most affected when the capability comes into being. To obtain this support, a Fleet RDT&E Plan will be prepared. Personal evaluation of, and recommended changes to, the device to optimize shipboard effectiveness will be actively solicited. Device changes accepted will be incorporated into the prototype equipment of Phase IV.

Electronic display media, for either training or maintenance information, are still in the primitive stages of development, and only a minor amount of research has been applied to establishing the most effective TI presentation formats. Thus several presentation design iterations, with extensive evaluation of a variety of formats at each iteration, are expected. A final production specification for a single electronic delivery device will be prepared after evaluation of prototype devices in Phase IV. The desired result of Phase III is thus a general evaluation of the operational effectiveness of the electronic-display medium, and recommendations for the next design iteration, which will be bought with R&D funds for more detailed evaluation during Phase IV.

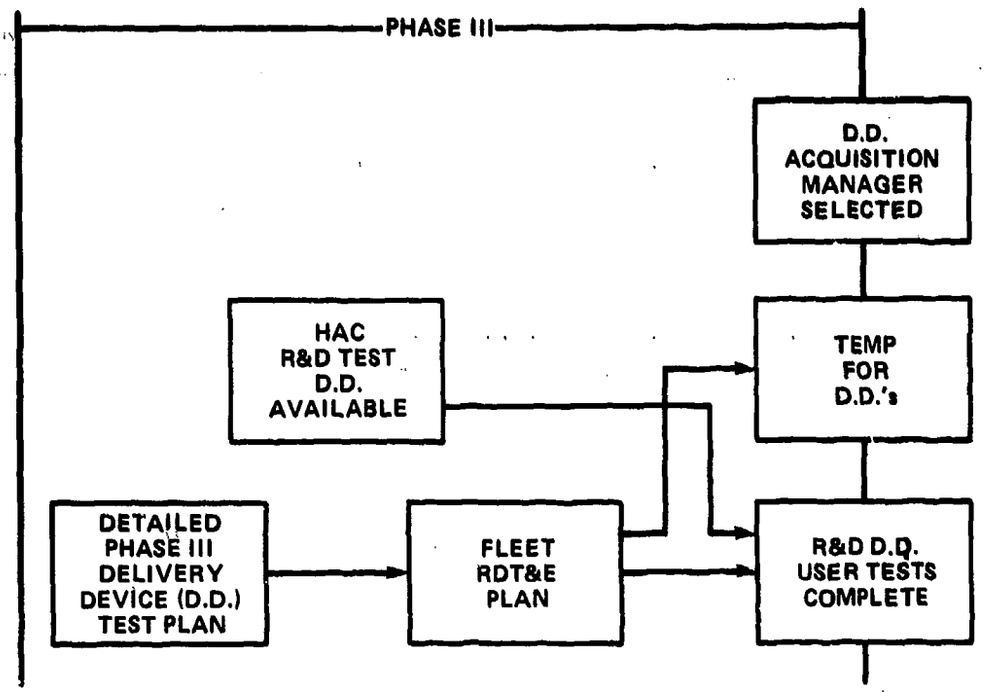


Figure 12 - Delivery Devices, Phase III Events

Phase IV/Stream P

Program Office - Prototype Phase

During Phase IV, the NTIPS management functions, handled during Phase III by the NTIPP Office, will be undertaken by the prototype NTIPS Organization (described under Phase IV, Stream 2) to be set up during the Prototype Phase. In addition to this Control Organization, an NTIPS Project Officer will have been designated (e.g., in MAT-042) who will be responsible for implementing NTIPS. The NTIP Program Office will work closely with the Project Officer on implementation matters such as modification of those NTIPS functions and components requiring design refinements and additional development. The level of effort required for these tasks will be contingent on the results of the Phase III tests. If extensive modification to the Phase II system design is required, a support contractor will be obtained at this point to help prepare a revised NTIPS design. Design documents not requiring refinement will be finalized and promulgated at the start of Phase IV.

The NTIPP Office will assist the NAVMAT Project Officer, who will be responsible for managing the overall implementation. One-time approval requests prepared by the Program Office (e.g., those required for Organization Revision, for ADP approval, or for JCP approval) will be submitted to higher authority by the NAVMAT Project Officer. The Program Office will continue to brief higher authority on developmental aspects of the Program. It will also perform NTIPS-specific training of the Prototype Organization. Presentations on the current and future operation of NTIPS itself will progressively be taken over by the Prototype Control Organization as it becomes operational. During Phase IV, the Prototype Control Organization will gradually assume the budgeting responsibilities for all operational aspects of NTIPS.

Acquisition of prototype electronic display devices for the Phase V OPEVAL/TECHEVAL, the obtaining of a formal Approval for Service Use (ASU), and other evaluations (Program Stream 5) will proceed during Phase IV; during this prototype phase, the Program Office will perform the planning and coordination required. An RDT&E effort designed to keep NTIPS abreast of the state-of-the-art, in general, will be shifted to the R&D function of the Control system by the end of Phase IV,

especially the carrying out of those developments involving short-term improvements in NTIPS elements. R&D related to completion of the electronic display device will be retained and completed by the Program Office.

Phase IV/Stream T

System Training - Prototype Phase

The initial effort during the Prototype Phase will be to train fully the (planned) 35 Prototype Organization personnel as quickly as practicable. The NTIP Program Office will manage this effort, using a support contractor. The effort will entail three weeks of formal training per person. It will include overview and function-specific training tailored to each individual.

A general indoctrination program will be developed for introducing Navy System Acquisition Managers and personnel involved in TI content generation to NTIPS. The primary instructional material to be used for this training will be the NTIPS handbooks. Thus an initial high-priority task for the Prototype Organization will be to update and publish the NTIPS handbooks. These will be designed to be self-teaching to the greatest extent possible.

NTIPS is designed to deliver better quality and more timely TI to the Fleet, without requiring extensive changes in Fleet procedures. The principal exception to this principle will be the introduction of the electronic display devices discussed below. During Phase IV, indoctrination of the Operating Forces will be to a large extent promotional to reduce resistance to change for innovations in either the electronic display devices when they are introduced, or in the associated TI itself. Articles will be published in Navy journals to prepare the Fleet and Shore Establishments for the introduction of the NTIP System.

The introduction of NTIPS-developed electronic display devices in large quantities in the 1990's will undoubtedly require an extensive training program and possibly a revision of some training philosophies. This effort will be planned by the System Acquisition Manager (SAM) of the electronic display devices themselves, as part of the NTIPS Prototype Organization during this phase. Thus for planning purposes, the Navy-wide Fleet training program dealing with electronic display devices will be considered a facet of NTIPS implementation.

Test and evaluation of the R&D prototype display devices will, of course, require training of those Fleet technicians who must use these R&D devices in a T&E phase. Training for test purposes will be managed by the NTIP Program Office.

During Phase IV, a complete training plan will be developed by the Prototype NTIPS Organization for the approximately 500 personnel expected to be assigned to NTIPS during Phase V. The Prototype Organization will budget for this training and process the required contracts for training services so that the training can begin early in Phase V as personnel are assigned to NTIPS.

Phase IV/Stream 1

Procedures - Prototype Phase

All drafts of directives presenting NTIPS procedures which have not previously been promulgated will be refined and finalized for issuance during this Phase. As shown in Figure 13, this process is continuous and is independent of other implementation events. The entire NTIPS design (with the exception of those aspects of the electronic display capability still in prototype evaluation) will be completed after a thorough analysis of the results of the Test Phase (III). This final design will be documented as a complete set of procedures in the form of specifications, standards, and implementing instructions, in addition to an element write-up for each NTIPS element. These documents, along with an organization plan, will constitute the principal description of the NTIP System and will be promulgated (or in the case of the NTIPS Organization, established) by the NAVMAT Project Office.

Initiation of those procedures requiring the existence of an operational NTIPS must await establishment of at least the prototype NTIPS organization; in some cases, such procedures cannot be put into full operation prior to the augmentation of the staff which will take place in Phase V.

In finalizing procedures which depend on the existence of an NTIPS organization, a system perspective must be adopted by the prototype organization to ensure that the complex interior interrelationships among all the proposed NTIPS elements are maintained properly. The prototype NTIPS Control Organization will be guided by the NTIPP Office in this effort.

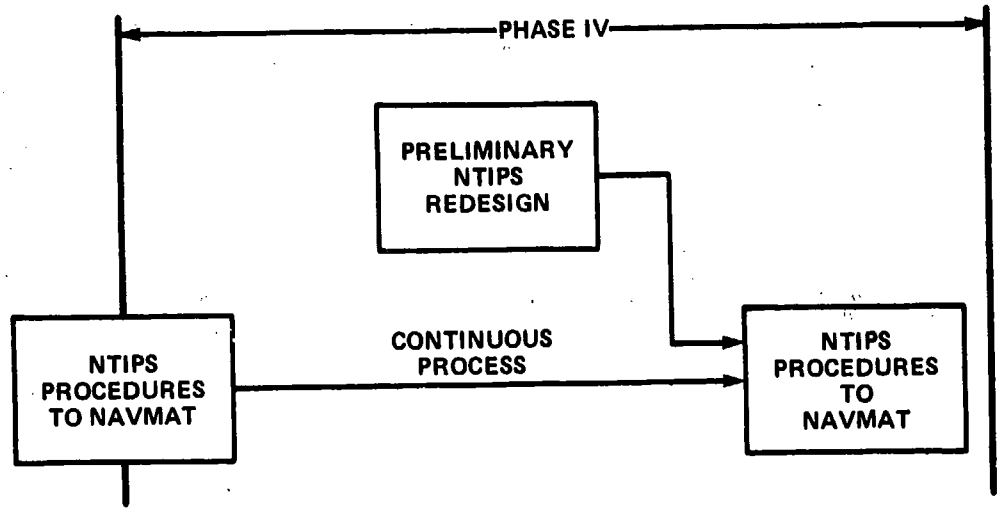


Figure 13 - Procedures, Phase IV Events

Phase IV/Stream 2

Organization - Prototype Phase

During Phase IV, NTIPS will be established as a prototype organization with assigned offices. It is estimated that for most of the two-year prototype period the staff will consist of 15 people for control functions and 10 each for support of NAVSEA and NAVAIR TI acquisition projects. Positions will be filled by temporary detail or permanent hire, with the concept that this staff will form the nucleus of the official NTIPS organization to be officially established and scheduled to begin formal operations before the end of Phase IV (see Figure 14). During the prototype stage, this staff will function as an identifiable entity and perform all the NTIPS-specified functions for a large subset of TI produced during that period.

Facilities separated organizationally from the current NSDSA and NATSF offices (but co-located geographically) will be established. All personnel details and individual work assignments will be handled by the parent activities. In addition to TI-related duties, this staff will continue to recommend refinements to the structure of the future NTIPS Organization, constrained only by the NTIPS functional design. Staff for the Control Functions of NTIPS will be designated by the NAVMAT Project Office, probably in the same geographical area as NAVMAT headquarters.

Starting at the end of Phase IV and continuing into Phase V, additional TI-related NAVAIR and NAVSEA personnel will be assigned to the Prototype NTIPS Organization, so that all the NTIPS staff can be brought on board by the end of Phase V. The many approval requests, detailed staffing plans, Position Description (PD) certifications, relocation plans (if any), etc., will be prepared by the Prototype Control Organization and submitted to the NAVMAT Project Officer so that he can obtain higher-level approval. These actions will be initiated at the beginning of this prototype phase.

The Prototype Organization will continue to examine the NTIPS operation with an eye to identifying those NTIPS functions which can best be performed by support

contractors in lieu of Government personnel. The staff of the control organization will revise the resulting NTIPS organizational concepts and approval chains when it is decided to shift performance of a function from in-house to a support contractor. They will also establish a plan to continue use of ongoing support contractors into Phase V as required.

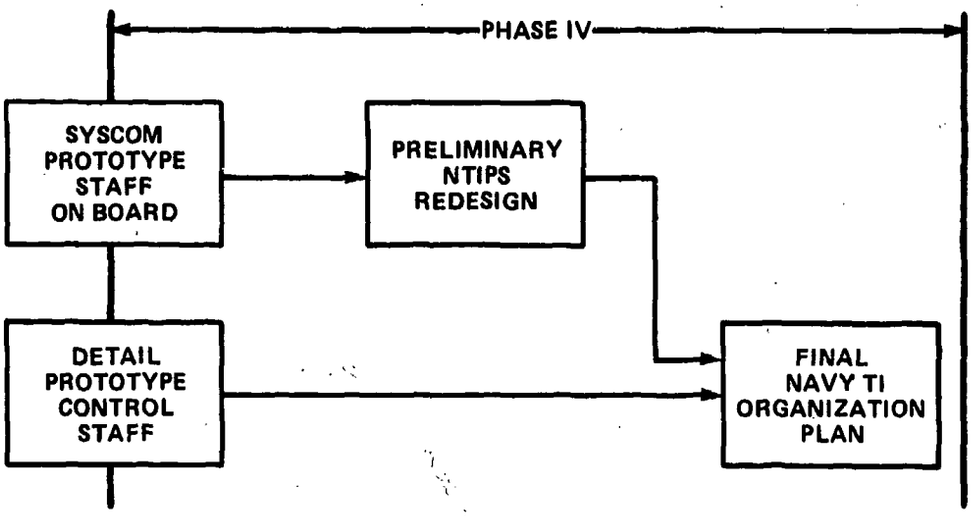


Figure 14 - Organization, Phase IV Events

Phase IV/Stream 3

CSIF Prototype Data Base

The NTIPS prototype organization will complete development of a consolidation program for all required CSIF (Control System Information Function) files and programs during this phase. The extensive effort to load the data bases during this phase will require resources for manpower and computer time and will continue into Phase V.

By the end of this prototype phase, all differences between the existing TI management information systems and the CSIF of NTIPS will have been eliminated by modifying or consolidating all existing information-system design as required. This consolidation plan is the primary CSIF product produced in Phase IV (see Figure 15). It will involve designating those existing TI-related data-base systems scheduled for retention and modification as the CSIF files. The prototype control-system organization will use these CSIF files as actual working tools in performing its functions, and will continue with loading as practical. By the end of Phase V, the CSIF files will be routinely used as the official control files of NTIPS.

NTIPS needs for control information will not require significantly greater computer resources than those that would be required if there were no NTIPS. However, since these existing data bases are not currently adequate to support production of quality TI in an effective manner, a requirement exists to establish additional information system resources, with or without NTIPS.

During this prototype phase, the current TI organizations will continue with actions designed to increase the Navy's TI Management Information System capability, but all approvals for procurements of new computer-based information systems will be made compatible with the ultimate NTIPS CSIF to be instituted in Phase V. The NTIP Program Office will ensure that NTIPS-specific requirements are taken into account in any information-system actions.

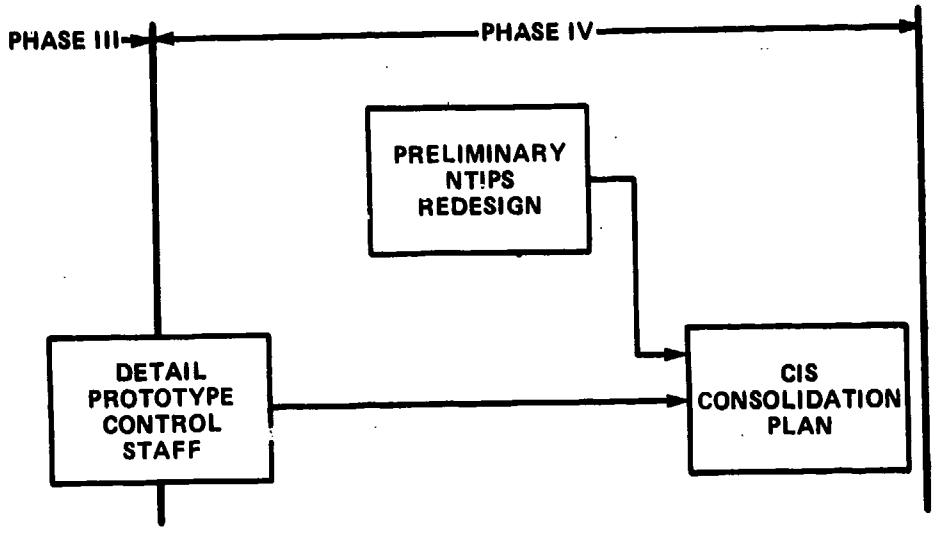


Figure 15 - CIS, Phase IV Events

Phase IV/Stream 4

TI Production System Prototype

During Phase IV, the services of a contractor-owned full-capability automated TI production system will be made available to the prototype NTIPS organization. Input features (e.g., authoring, medium conversion for text and graphics) must be available early in the phase. All features--input, archives, and medium-specific output--must be available in the second year of Phase IV. The entire automated TI production capability will be established in accordance with a specification to be finalized near the end of Phase III. To ensure that there will be no gaps in service, the timing of the finalization of specifications and establishment of the production system must be tightly controlled. To avoid a time-lag between award of contract and delivery of service, it will be necessary to maintain throughout the early part of Phase IV some of the TI production services secured on an ad hoc basis in Phase III. Plans for the first full operational system will be prepared during the prototype phase (see Figure 16) for availability in Phase V.

The strategy for establishing an automated production capability will be as follows:

1. Government procurement of the production hardware for Navy-owned, in-house use has been ruled out for NTIPS. Even if in-house ownership were considered a desirable option, insufficient time would exist to secure the necessary funds and approvals and to address the predictable Government/Industry policy questions for Phase IV.

2. A system-wide specification will be finalized near the end of Phase III. (This will be a refinement of the Phase II design, based on Phase III test results.) The NTIPP Office and/or its support contractors will develop the specification.

3. A competitive solicitation will be issued to locate a single-source vendor who will build a prototype production system, primarily under commercial capitalization, and who, with this system, will provide the required authoring, mastering, and replication services to Navy customers <u>on a fee-for-service basis</u>.

If necessary, the Navy will contribute to the development expense but, since the projected service will also be offered commercially to other customers, it is expected that the development expense will be primarily borne by the vendor. The Government will guarantee a certain level of work for a two-year period to allow the vendor to recoup the capital outlay and operating expenses.

4. The solicited service will also include the building and temporary maintenance of the TI archives. However, since it is intended that the Navy will own and operate the archives in Phase V and after, the contractor would operate that function in such a manner that archives control and operation can be easily transferred to the Navy. The archival data and associated indices will be delivered to the Navy at the end of the contract period for conversion as Navy-owned archives.

5. An option to continue the production services for an additional year into Phase V will be required to permit continued operation, in case the Phase V full-scale production capabilities are not fully operational by the start of that Phase.

6. The solicitation would be competitive, but eligible bidders would be restricted to those vendors who have already operated similar automated publishing facilities in-house (or who have them available on an existing subcontract) so that key input functions could be made available immediately (within two months) after award.

7. Remote authoring capability would be made available to TI generators (i.e., terminals would be at a user's site; processing at the vendor's site). Note: In Phase V, it is expected that authoring will be done either on compatible stamd-alone devices or TI-generator-owned systems performing in accordance with the NTIPS standard, with the completed TI delivered in electronic-galley form. Since authoring is the first step in the processing chain, provisions to provide the authoring capability early in Phase IV will be necessary. This will be made possible by a continuation of the ad hoc service of Phase III for selected capabilities (e.g., authoring and medium conversion).

8. During the prototype phase, the scope this service is estimated at the following workload level:

	Year 1	Year 2	
Originated Page Equivalents	20,000	50,000	[Note: numbers
Converted Page Equivalents	10,000	20,000	subject to revision]

9. A procurment specification to establish the Navy-owned electronic archives will be prepared during the first prototype year. At the end of the second year, an RFP will be issued, with an award scheduled early in Phase V.

10. Proposed implementation and procurement schedules are as follows:

Time (Months relative to start of Phase IV=D)	Action
D-3	Complete Automated TI Production System Specification for Prototype Phase
D-1	Initiate RFP Action
D+0	Issue RFP for Prototype ATIPS (to be contractor owned/operated)
D+3	Award Contract
D+5	Provide Initial Input Material for TI Generation Including Authoring for Text and Tables
D+6	Provide Authoring for Graphics
D+8	All Input Processes Including the Archiving Available
D+10	All Functions Available
D+24	Date of Option to Extend Service
D+25	Deliver Archived Data to Navy (unless delivery date extended)
D+18	Specification for TI Navy-owned Archives
D+20	Issue RFP for Archives
D+24	Specification for Final Operational System (first award)
D+26	Award Contract for TI Archives

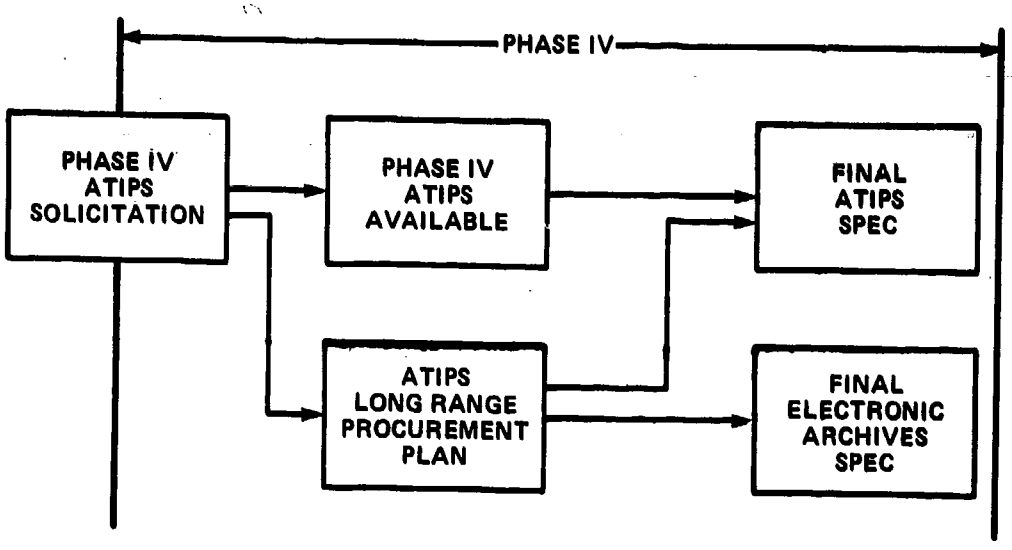


Figure 16 - ATIPS, Phase IV Events

Phase IV/Stream 5

Electronic Display System - Prototype Phase

This effort will include: (1) continued research on both a fixed work-center electronic delivery device and on a portable delivery device (managed by the Program Office); and (2) the establishment of a system-acquisition management capability in the NTIPS organization for the procurement and wide-scale introduction of operational delivery systems of the future into the Navy.

The initial effort under Phase IV will be the preparation of a revision to the delivery-device performance specification (initially developed in Phase II) based on evaluation of the Phase III test results obtained with the device developed by Hughes Aircraft concurrently with Phase II. This specification will be used to procure a limited number (20) of prototype delivery devices during Phase IV for subsequent field tests (OPEVAL/TECHEVAL) and laboratory experiments in Phase V. Figure 17 shows key events for Phase IV.

The operational tests conducted during this period will involve the shipboard display of proceduralized troubleshooting information, for which techniques are expected to be well developed by this time. The laboratory tests concentrate on the evaluation of new and alternative formats involving factors such as sound, color, motion, and continuous-tone graphics. They will also explore the application of this display medium to other categories of TI such as operating procedures, non-proceduralized troubleshooting, and deductive aids.

At the end of the prototype phase, plans will be made for follow-on field tests and additional laboratory experiments to be carried out during Phase V. The results of these tests on new formats, additional applications, and possibly modified display device designs reflecting emerging state-of-the-art improvements will be analyzed to prepare a revised performance specification for a larger purchase during Phase V of ruggedized versions of a modified prototype display device for Navy-wide use. Ongoing efforts of the NTIP Program Office in assessing the state-of-the-art and other developmental display programs in Government and Industry will also contribute to the revised specification.

Since an Approval for Service Use (ASU) will be required for the operational delivery devices, the arrangements for this and other OPTEVFOR involvement will be initiated during Phase IV. These will be handled by a hardware-system acquisition-manager who will be established as part of the Prototype NTIPS Organization during Phase IV to handle production buys of electronic display devices in late Phase IV and subsequently. Large procurements (i.e., greater than $10 million per year) are not envisioned until after Phase V, five years in the future; however, extensive preliminary tasks must be performed. These include: (1) preparation of an ILS plan; (2) establishment of a complete user-training strategy and plan; and (3) preparation of the many planning and approval documents required for large-scale system acquisition. The R&D portions of the program will continue to be managed by the NTIP Program Office during this phase.

Thus the overall plan for introduction into the operational forces of electronic delivery devices calls for preparation of a firm hardware specification before the end of Phase IV, but a continuing developmental program on presentation formats and applications. The hardware specification will most likely require that certain capabilities be included for which applications and TI formats will not have been fully developed, but which will probably be required for future applications (e.g., motion, sound, general-purpose interface buss). This policy is based on the prediction that hardware will be more advanced than software during this period.

In addition to continuing a developmental effort for the display devices and information formats, NTIPP will also design and specify all the support infrastructure required in accordance with sound ILS procedures, and it must also specify the various transportable media to be employed in the distribution of the electronic TI from a support center to the user site. These aspects will have been sketched out in the Phase II design but will require extensive development and augmentation during Phase IV.

By the end of Phase IV, NTIPS will have a complete requirements specification for the electronic display device support systems and an associated implementation plan. Detailed establishment of a full-scale support capability will not start until Phase V, with delivery of production units.

The final large-scale support-system level will not be reached until significant quantities of both display devices and displayable TI are fielded, a situation which will occur in Phase VI (i.e., the 1990's). These support capabilities will involve: (1) all services required to back up the electronic display stations; (2) a widespread capability to generate and use electronic TI; (3) a capability for maintaining and resupplying the devices themselves; and (4) a system which will process user feedback from the work stations. It is likely that some modification to the automated TI production system will also be required to generate material compatible with the display devices of the 1990's.

Because of rapid developments in the state-of-the-art of candidate transportable data-storage media, a wide range of possibilities will be available during this period (e.g., optical/video disk, very high density magnetic media, bubble technologies). Initial prototype delivery devices need not, therefore, be constrained to a single data medium. However, since such flexibility could be costly (either in dollar cost or downgraded performance), a decision on the transportable data medium to be used will be required before the specification for any ruggedized followup prototype procurement is finalized for production procurements.

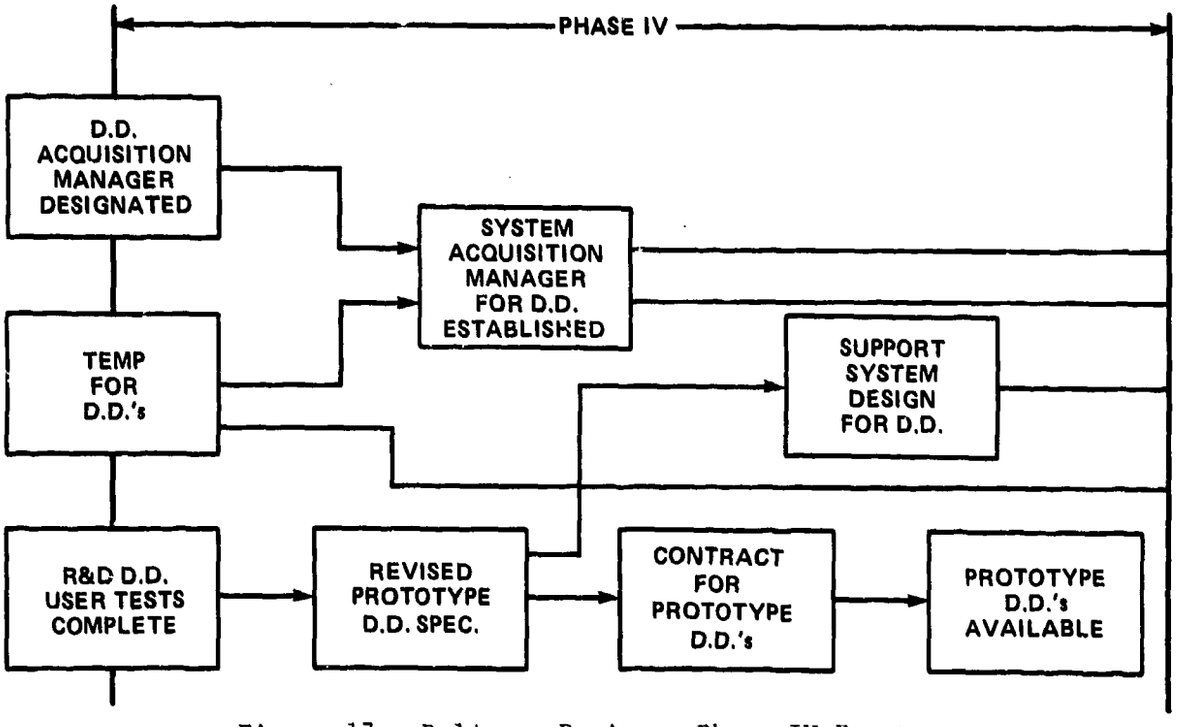


Figure 17 - Delivery Devices, Phase IV Events

Phase V/Stream P

Program Office - Establish-Full-Capability Phase

All NTIPS control functions will have been transferred from the NTIP Program Office to the NTIPS Control Organization by Phase V. The primary responsibility of the Program Office during Phase V will be the RDT&E aspects of the electronic delivery-system development effort, but other R&D support is possible, as required. Procurement specifications for (1) the transportable media to be utilized in the distribution of information to user sites, and (2) the design of the production display devices will be completed in this phase, and specifications will be made ready for an operational-system buy.

The R&D program conducted by the Program Office will concentrate on the development and evaluation of presentation philosophy, format, and style, and on the final design of support systems required to back up the display devices when they are fielded in large numbers.

As new information-presentation formats are evaluated and recommended for use, the Program Office will incorporate the associated parameters into the user/TI match data base.

The NTIP Program Office will assist the NTIPS Control Organization as requested on an ad hoc basis. However, the specific final modifications to the NTIPS design to provide optimum full-scale NTIPS operation will be accomplished by the NTIPS Control Organization.

The NTIP Program Office will continue to assess the state-of-the-art of the the electronic display/presentation fields. If it appears that technology advances forecast for the 1990's will be of significant benefit to the NTIPS operation, the NTIP Program Office will propose an appropriate R&D program. Potential technologies may include AI (Artificial Intelligence) machines capable of proposing courses of action in a given case, maintenance and repair robots, and integrated automated diagnostic- and corrective-action systems.

Phase V/Stream T

System Training - Establish-Full-Capability Phase

During this phase, all personnel assigned to NTIPS will be fully trained in their new job assignments. Each of the approximately 500 members expected on the Navy TI staff will attend two weeks of classroom training and will receive some on-the-job training. The classroom training will entail a single NTIP System Overview for everyone and function-specific training for each person, related to his job responsibilities. These sessions will be conducted by a contractor. The required RFP will have been issued at the end of Phase IV and an award made early in Phase V. On-the-job training will be conducted by in-house personnel who by this time will have had experience in NTIPS operations (e.g., members of the Prototype Organization staff from Phase IV).

The general overview training for TI Content Generators and hardware System Acquisition Managers will be revised and finalized early in this Phase. The self-teaching NTIPS handbooks will be revised, as necessary, and republished in a final form for wide distribution.

The NTIPS Control Organization will mount an extensive promotional effort to acquaint Fleet personnel with the Fleet aspects and capabilities of NTIPS and to familiarize them with the forthcoming electronic-display capability to be introduced on a wide scale in the future.

Specific Fleet training using fielded electronic display devices will be managed and planned by the Electronic Display System Acquisition Manager of the NTIPS Organization (assisted by the NTIP Program Office as required). Training involving the feedback system implemented in this Phase (the Technical Information Deficiency Evaluation Reporting (TIDER) System) will be managed by the NTIPS Control Organization. During this Phase, the NTIP Program Office will arrange any specific training required to equip Fleet test personnel to perform test and evaluation of R&D prototype electronic-display devices.

Phase V/Stream 1

Procedures - Establish-Full-Capability Phase

All NTIPS procedures will have been promulgated and placed into operation by the NTIPS Control Organization by the end of this phase. All directives involved in setting up the continuing NTIPS Organization and specifying its functions will have been submitted for detailed high-level approval by the end of Phase IV. This package as approved will be the charter for achieving full-function operation in Phase V. This Organization will manage the issuing of any instruction not yet implemented, so that NTIPS instructions will replace or subsume all previous TI-related instructions if possible by the end of the first year in Phase V (see Figure 18).

The effective date of certain operations will come after the date on which directives are actually promulgated if responsibility for those operations has not been fully transferred to the NTIPS Ogranization by that time. The implementation policy will be to issue all the NTIPS Control Organization instructions as of a certain date (to be fixed early in Phase V) and treat any lagging operations as exceptions.

The NTIPS Control Organization will originate new procedures as appropriate. If developmental assistance is required, the NTIPS Control Organization will have its own R&D arm by this time for the required service. Procedures and policies which deal specifically with the electronic-display capability will be prepared by the NTIP Program Office and forwarded to the NTIPS Organization for formal implementation as the technology becomes operational.

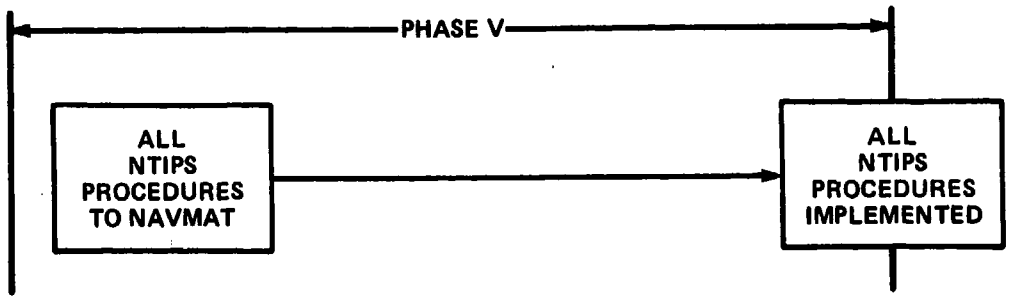


Figure 18 - Procedures, Phase V Events

Phase V/Stream 2

Organization - Establish-Full-Capability Phase

During Phase V, the NTIPS Organization will be established. It is expected that the cadre detailed to the NTIPS Prototype Organization will form the core of this Organization. As quickly as practicable, all of the personnel assigned to existing organizations and designated to be part of NTIPS will be transferred to the NTIPS Organization. All these actions are planned to be complete by the end of this Phase (see Figure 19). For the most part this action is expected to consist of reorganizing and renaming existing activities, primarily at NATSF and NSDSA.

As envisioned, establishment of the NTIPS Organization will require the creation of an entirely new entity established as a CNM field activity and involve the relocation of certain personnel. The planning for this reorganization will have been initiated during Phase IV but its completion may be delayed until one or two years into Phase V, depending on the time involved in obtaining the required approval and in making the physical arrangements.

This reorganization will be managed and administered by the existing NTIPS Organization. By the end of Phase V, the NTIPS Organization (most likely in the form of a central Control Organization and two subordinate line departments) will consist of approximately 500 personnel, subsuming most of the present NATSF and NSDSA staffs retained for the most part in their current geographical locations.

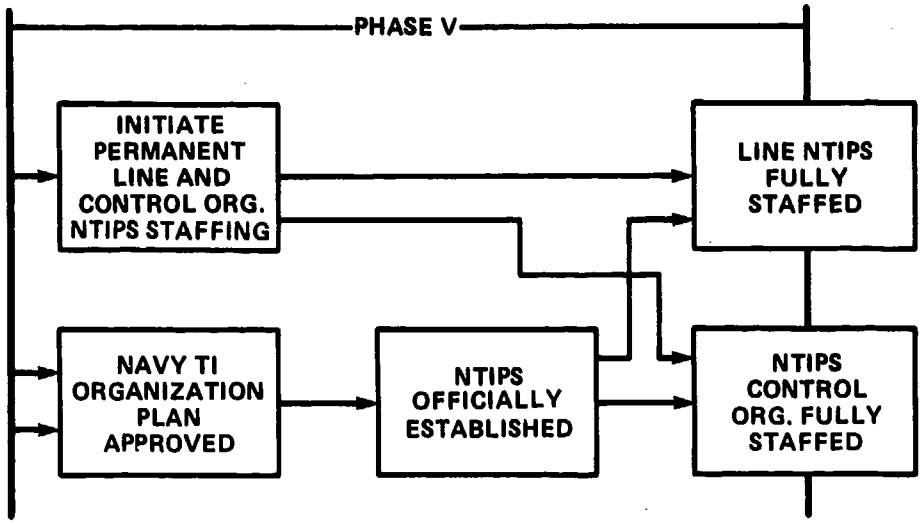


Figure 19 - Organization, Phase V Events

Phase V/Stream 3

Control System Information Function (CSIF) Data Bases -
Establish-Full-Capability Phase

By the beginning of Phase V, portions of the existing information systems will have been converted to NTIPS information systems. The goal is for all the NTIPS CSIF files to be capable of use in day-to-day production and decision-making before the end of Phase V (see Figure 20). Initial loading and data refinement required for this goal will be completed in this phase and will require appropriate resources. These one-time loading and conversion efforts will be in addition to the routine file-maintenance functions performed by the operational NTIPS activities.

Any incompatibilities between current information systems and NTIPS requirements must be resolved by this Phase. The NTIPS Organization will take over the responsibility for any ADP procurements, plans, or approval requests for ongoing systems which are to be converted to CSIF systems, taking care to see that they are modified as necessary to meet Control-system requirements.

Revision of required systems to the CSIF design in this time period will be handled by the NTIPS Control Organization as a routine part of its management responsibilities. Acquisition of any new or additional computer resources required in this Phase or later will also be handled by the NTIPS Control Organization.

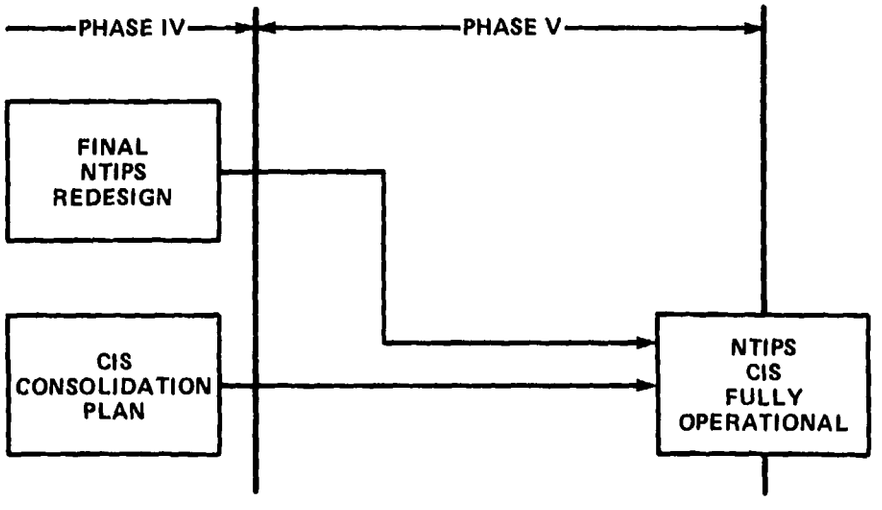


Figure 20 - CIS, Phase V Events

Phase V/Stream 4

Automated TI Production System - Establish-Full-Capability Phase

In Phase V, the steady-state operational capability for obtaining automated TI production services will be established. The full scope of capabilities is planned to be available by the end of the phase (see Figure 21). The mode of operation will entail the completion and use of the Navy-owned and-operated electronic master file (i.e., the Electronic Archives) of all TI produced by the NTIPS production system. All other production services will be obtained via private-industry service bureaus, which will have been established based on the NTIPS design.

The NTIPS Control Organization will procure and staff the Archives operation and set up the contracts for the required service-bureau operations. The actual replication contracts will be secured through the Navy Publications and Printing Service. The Automated TI Production System will be used during this phase by the content generators to: (1) author TI to the proper Archives format; (2) modify previously published material in the Archives; and (3) master, replicate, and distribute medium-specific TI from the electronic master file held by the Archives.

The required procurement actions for the Archives will have been started early in Phase IV. This procurement will be completed as early as possible in Phase V. The Archives, built up by the prototype contractor in Phase IV, will be transferred to Navy ownership when the Archives become operational. The Phase IV contract will require extension as necessary to preserve continuity (under an option which will have been set up in that initial contract in Phase IV). Navy control of the Archives and its content is crucial to the NTIPS design and will be given high priority. The Archives is the primary mechanism which will be used to interface the multiple-production system-service contracts envisioned, and should be in place before multiple-service contracts are awarded.

The electronic Archives is dedicated to a single function: storage and retrieval of the actual finished TI. The Archives will require a computer-like processor. The data may be either standard coded digital data or non-digital

image data such as a raster scanned analog trace. Loading and retrieval will be governed by a microprocessor which serves as an embedded processor controller and is not a piece of general-purpose ADP equipment.

The service-bureau operations for authoring, medium conversion, mastering, and replicating the TI will be set up on a competitive basis. It is planned to award contracts to multiple sources. Any one operation need not supply all the required services, and individual vendors may specialize in the major application areas such as authoring (text only or full text and illustrations), medium conversion, medium-specific mastering, replication, or distribution. Vendors may also specialize by industry segment (e.g., Aerospace). The NTIPS Organization will determine which services are required in what quantities and in what geographic locations, and will plan and manage all aspects necessary to secure the required capabilities.

Under this plan, the hardware-system TI developer will be billed by the service bureau for the specific TI services utilized. A contractor providing TI to the Navy would, of course, include this cost in his TI price estimate. For aspects related directly to printing, NTIPS would specify the services required and obtain price estimates, but the Navy Publications and Printing Service would contract for the actual work. Because of the complex interrelationships among elements of the NTIPS-designed automated production system, these specifications will usually be in greater detail than those of traditional printing contracts.

As an optional mode of operation, under a version of the NTIPS production-system specification to be prepared by the NTIPS Organization, large Navy equipment suppliers will be encouraged to build and operate an NTIPS-compatible authoring and medium-conversion system in-house in lieu of using an NTIPS service-bureau vendor. The output of such a system would be in the NTIPS Archives form (i.e., electronic galleys). Such an in-house system would also have the capability to accept the standard NTIPS formatted data from the Navy Archives as GFI for inclusion in a newly authored or revised set of TI.

Time phasing involved in establishing the service-bureau capability will be regulated by the NTIPS Organization after the volume of TI to be authored electronically is determined. This effort will require a forecasting capability within the NTIPS Control Organization.

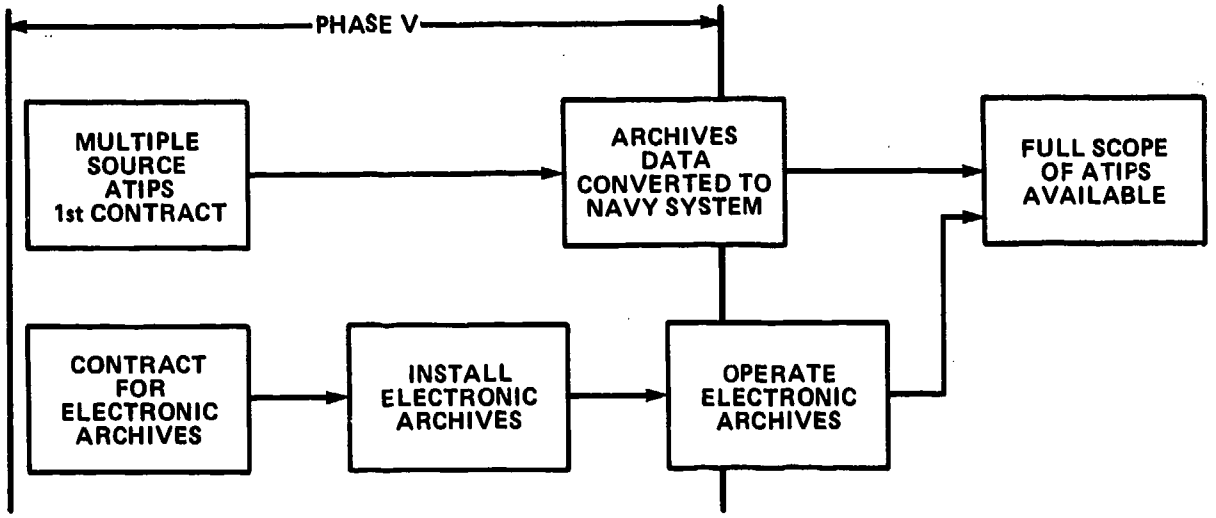


Figure 21 - ATIPS, Phase V Events

Phase V/Stream 5

Electronic Display Delivery System - Establish-Full-Capability Phase

During Phase V the following actions necessary to continue development and implementation of the electronic display system will be carried out:

1. Testing (OPEVAL/TECHVAL) will be carried out, according to a test plan developed and coordinated with OPTEVFOR early in Phase V, to thoroughly evaluate the ruggedized prototype delivery devices in all parts of the Navy--ships, tenders, squadrons, depots, training facilities, and shore establishments. An Approval for Service Use (ASU) will be obtained.

2. 100 ruggedized prototype devices will be procured (possibly from several contractors) over the first two years of the phase.

3. Tests will be performed and evaluated, after which a final production-system specification will be prepared.

4. All support requirements will be identified, and a detailed ILS plan will be prepared based also on the requirements analysis completed in Phase IV. The establishment of a support capability will be initiated, phased to operational system buys.

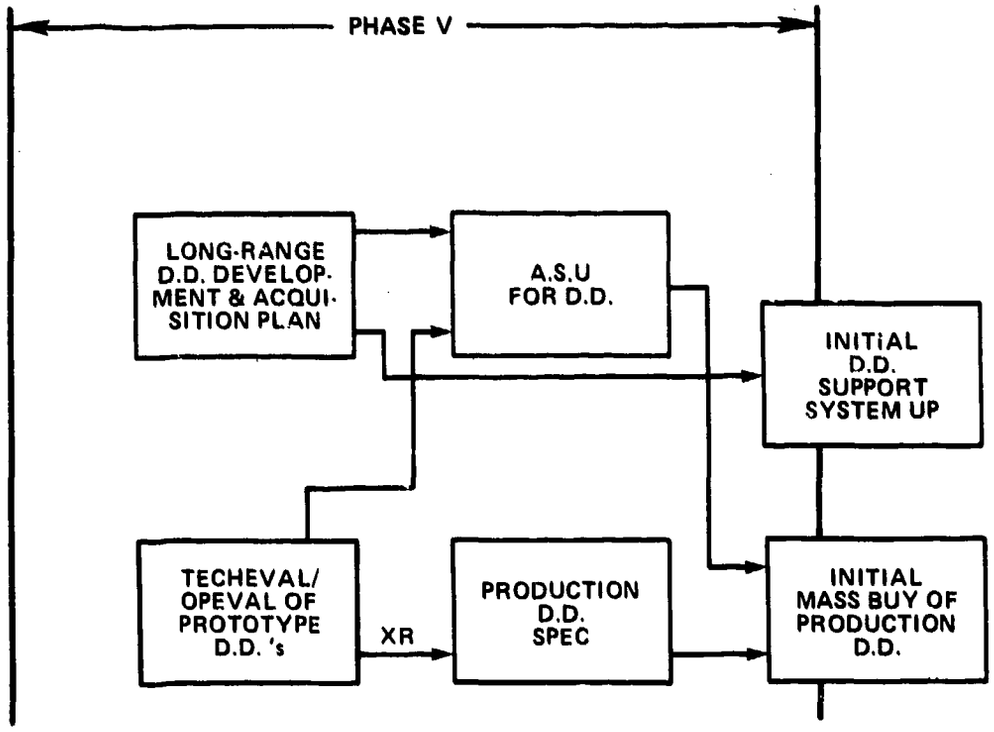
5. The Systems Acquisition Manager in the NTIPS Control Organization will commence action for production-system buys late in Phase V. Initial planning and program budgeting will have been started by the NTIPS Control Organization in Phase IV. In Phase V, the Systems Acquisition Manager will take over all responsibilities for fielding of the display devices, including obtaining approvals such as the ASU.

6. A continuing research program will develop and evaluate advanced information-presentation formats for the display devices. The associated authoring techniques will also be developed, and proposed revisions to the Automated TI

Production System will be forwarded from the NTIP Program Office to the NTIPS Control Organization.

Efforts during this period will be jointly managed by the NTIP Program Office (for R&D aspects) and the System Acquisition Manager of NTIPS (for final test, evaluation, and implementation aspects). Figure 22 shows key Phase V events relating to delivery devices. The System Acquisition Manager will plan production buys and the establishment of the support infrastructure. Specific responsibilities will be assigned at the beginning of Phase V coincident with the formal establishment of the NTIPS Organization and, more specifically, with establishment of the electronic display-system acquisition function under the NTIPS Organization.

In addition to the operational tests, some of the ruggedized display devices will be: (1) subjected to rigorous environmental and safety tests; (2) used in the laboratories for development and evaluation of new presentation techniques; and (3) provided to the other Armed Services for interservice coordination.



ɣure 22 - Delivery Devices, Phase V Events

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