Reporting will consist of Maintenance Data Collection System Reports, and the Field Service Reports (oriented to contractor on-site activity).

The Navy civilian representative on-site, in pipeline training, will not only prepare for the eventual take over of the contractor's specialized assistance role, but will also provide an NTDC Quality Assurance monitoring function, for all program elements. For example, he will verify that all software is adequate and correct. Industry must "home-in" on their main objective early in order to achieve the desired transition. Ammunition such as test equipment, tools, qualified personnel, software, etc., must be applied to the task. Everything must point to the day of device transition from contractor support to Navy selfsufficiency.

Specialized assistance, which is over-and-above the technical capability of the Tradevman, must eventually be provided by the Navy civilian field representatives; therefore, a timely transition from the contractor is required here too. This Navy field representative comes well qualified both through experience and training. In fact, he will typically enter his Pipeline Training or preparation phase 3 or 4 months prior to equipment delivery. He will usually be at the factory, under the cognizance of the NTDC Project Engineer during final check out and Reliability testing.

As you may realize in the short time permitted for the two-part presentation on the Maintenance Data Collection System and Augmented Support; the device contractor, to successfully discharge his responsibilities, must be capable, highly motivated, and interested in the achievement of overall NTDC goals, as well as his own.

## PRODUCT IMPROVEMENT

Mr. John Regan
Modification Engineering Program Manager

Up to this time the conference discussion has highlighted the acquisition or procurement phase of the training device. Let us now consider the operational phase, the changes that occur to the device during this phase and the part NTDC and Industry play in incorporating these changes into the devices.

For the purpose of this discussion let us assume that the operational phase is that phase which begins when the production contract coverage ceases and extends throughout the operational life of the device.

Changes to the original device occur to:

a. Correct deficiencies in Performance, Maintainability and Reliability

b. Incorporate additional training requirements

c. Keep the device current with operational equipment changes

d. Update the device from one operational equipment model to another

e. Convert the device from one type of operational equipment to another

f. Modernize the device by employing hardware current with the state of the art. (This could also be considered a reliability or maintainability improvement.)

A deficiency in performance exists when the training device does not reasonably simulate what the trainee will encounter in the operational situation.

What about reliability and maintainability? When the device is unreliable or hard to maintain, a greater amount of resources must be expended to make the device available for training. When the level of these resources is low, interruptions or loss in training occur, which are serious detriments to the trainees ability to react in the operational situation. When an emergency occurs and sufficient training was not available, does the trainee know what, when, and how to react?

In addition to changes that occur due to deficiencies there is an ever increasing demand for new simulation to satisfy training requirements generated by changes in the operational situation. This might be a change in the enemy's tactics or might be a change or hindrance in the environmental conditions, such as jamming during an AAW exercise or very noisy fish during an ASW problem.

When training devices are designed to reflect and simulate operational equipment, all changes to such operational equipment must be reviewed and a determination made as to their applicability and extent of simulation required to incorporate the change into the training device. Some of these changes are issued by the Navy as technical directives. An example of these directives are those issued by the Naval Air Systems Command as changes. They encompass every element of the aircraft from simple accessory changes to support equipment changes. Consider a hypothetical case where, for some reason, a directive changes the relative position of the windshield wiper switch with a bomb salvo or jettison switch. Consider also that this change is not reflected in the training device. The trainee (pilot) continues to train under the old configuration and while operating the actual equipment encounters a situation where he must employ this training. This could cost lives—

Update - As operational equipment advances through its life cycle, there is birth given to new models which tend to push the older models into obsolescence. As the older models approach obsolescence, the training requirement for them decreases and the training requirements for newer models increases. It becomes necessary to some point in this time frame, to update the training device to reflect the newer model.

When a device becomes obsolete as far as training is concerned but still maintains a reasonable life expectancy, it is sometimes most economical to convert the device by redesign to simulate more modern operational equipment. In these cases, the basic simulation techniques could be compatible to the new system by changes in design parameters. For instance, a A-4C aircraft simulator could be converted to a A-4E aircraft simulator by changes to its physical and design characteristics.

The last category to be defined is modernization. Modernization can be defined as changes to a device increasing its overall capability by incorporating systems and hardware that are current with the present state of the art.

I believe it should now be apparent that the changes discussed may vary in scope from a simple component change to the complete rework of a device. Each change whatever the scope requires support in the form of updating of manuals, drawings and spare parts. Consideration must also be given to tools and test equipment and additional training required to support a major change.

NTDC has been given the responsibility to give support to the Fleet regarding changes to Navy devices. Each and every change that is needed must be considered primarily as additional training required to support a deterrent that is organized to maintain peace in the free world. With this in mind, we must react responsibly to satisfying the need.

Changes are communicated to the Center by many channels; some of these channels are:

Technical Directives

The Using Activity

Maintaining Activity

NTDC Regional Office Inspection Reports

NTDC Field Service Representatives

Training Agencies of the Armed Forces

Once NTDC has become aware of a requirement, the wheels are put into motion to satisfy the need. As we learned from previous speakers, Plans and Programs, Code 60, sets up the funds required to complete the task as described and specified by the Project Officer/Engineer Team. The project engineer ties in the support items and decides the most efficient and economical means to do the task. In deciding the best path, several elements are taken into consideration. Some elements of consideration are:

Scope

Urgency

Cost and Lead Time

Pre-task milestones

Contractor Past Performance

Based on the evaluation of the task element, the Center engineer decides either to implement the task through competitive procurement, sole source procurement or by employing the in-house capability it has for the smaller most urgent requirements.

Whenever training is being considered we are all very aware the biggest problem we face is lead time. NTDC has taken steps to reduce this lead time by establishing a concentrated effort within its organization, that is mainly concerning changes to training devices. Other measures have been taken such as awarding call type contracts to manufacturers of devices to which changes are frequent. These measures definitely will help to satisfy the need in a more timely fashion; however, without the support of industry the program would not perform the mission for which it was intended. When the contractor is requested to come to the aid of the fleet, he must recognize the need and consider himself a very important member of a team to satisfy training needs which in turn protect our freedom. Quick response on the part of all team members is necessary and we must all look for ways in which maximum efficiency is obtained. Remember the training device carries both our names.