

~~SECRET~~
UNCLASSIFIED



**REPORT
OF THE
AIR-TO-AIR MISSILE SYSTEM
CAPABILITY REVIEW (U)**

JULY-NOVEMBER 1968

APPENDIX VI

NAVAL AIR SYSTEMS COMMAND

UNCLASSIFIED
~~SECRET~~

[REDACTED]

UNCLASSIFIED

APPENDIX VI

FMSAEG SUPPORT OF AIR-TO-AIR MISSILE SYSTEMS
PROGRAM REQUIREMENTS

[REDACTED]

UNCLASSIFIED

~~SECRET~~ UNCLASSIFIED

FMSAEG SUPPORT OF AIR-TO-AIR MISSILE SYSTEMS PROGRAM REQUIREMENTS

1. For more than ten years FMSAEG has been collecting, processing, analyzing and evaluating the quality, reliability, readiness and performance of all Navy air-to-air guided missile weapons systems. The results of FMSAEG's efforts have been published periodically including information on systems troubles and failures. Based on its experience with the air-to-air missile program, FMSAEG believes that the following functions have been seriously neglected and must be implemented on an urgent basis and at a substantial level of effort:

a. Develop and implement a deficiency/failure corrective action program.

A "Quick-look" at the AAM Systems Committee reports reveals that a large number of the existing weapons systems problems have been known for some time but no apparent action has been taken to investigate and correct them. It is obvious that a need exists for a dynamic system to be developed and implemented to monitor a corrective action program. Two such systems, which were originally developed by FMSAEG, are being conducted. One of these is the Deficiency Corrective Action Program (DCAP) which is being conducted for SMS Projects Office by the Naval Ship Missile Systems Engineering Station (see Item 1, TAB A). The FBMWS Trouble and Failure Report Program is being conducted for the Strategic Systems Project Office by FMSAEG. (see Item 2, TAB A).

b. Assignment of In-Service Engineering Responsibility to a cognizant Field Activity for each Weapon System.

A critical need exists for a field activity to be provided the necessary responsibility, authority, and the associated resources to perform in-service engineering functions for air-to-air missile systems in accordance with the NAVAIR Instruction listed as Item 3 on TAB A. Such an activity could then close the loop on those troubles, failures and deficiencies identified and monitored by the system proposed in paragraph 1 (a) above.

c. Establish a requirement for periodic reports to cognizant activities by Commanding Officers of squadrons firing guided missiles.

The SMS Project Office requires that the Commanding Officers of guided missile ships provide periodic narrative reports on the performance of their guided missile systems (see Item 4 on TAB A.) The information submitted in these reports is often not documented in any other form and provides valuable information on the performance of these systems, the problems encountered, and suggestions for changes and improvements. It is recommended that the aircraft squadron commander provide similar reports on their AAM systems.

~~SECRET~~ UNCLASSIFIED

UNCLASSIFIED

d. Use of Telemetry Packs

When an air-to-air missile is fired in training, in combat or for special evaluation, it is imperative that the maximum amount of information be collected and evaluated. Accordingly it is recommended that TLM packs be used in firings of all air-to-air missiles including those configured with warheads.

2. In addition to those functions vital to a successful AAM Systems program, which are discussed in paragraph 1, FMSAEG is conducting other important functions pertinent to this program within its assigned mission and tasks. Specifically the tasks which FMSAEG is performing for NAVAIR are discussed in the letter listed as Item 5, TAB A. Although the funds provided in FY 1969 are significantly less than those requested, especially in the fleet support area (Code AIR-04A2), FMSAEG is assigning some effort to most of the FY 1969 described areas. In brief they are:

a. Evaluation of weapon station data collected during checkout of missile rounds or missile sub-assemblies; e.g., G&C sections. Reports of these evaluations are provided NAVAIR and cognizant field stations and missile contractors.

b. Evaluation of data recorded by the pilots during all missile firings is collected, assessed and analyzed as well as the telemetered results obtained by FMSAEG for most SPARROW III firings. Periodic summary and special reports of the firing results are provided cognizant activities.

c. Data is being obtained, on a somewhat informal basis, from the repair and rework facilities (NAVAIREWORKFACS) at Alameda and Norfolk during their work on missile guidance and control sections. This data is analyzed and provides valuable information concerning the quality and reliability of the components and parts of the G&C's. Accordingly, FMSAEG reports provide failure trend information and was most recently used to identify specific SPARROW III seeker and control sections by serial number containing faulty potentiometers for both Navy and Air Force. It is recommended that the collection and analysis of this data be formalized and expanded to cover the complete round and other parts of the weapon system as appropriate.

d. Periodically the Quality Evaluation Laboratories conduct extensive destructive and non-destructive tests of missile round assemblies and sub-assemblies. These tests are usually performed on samples taken from the stockpile. Results of these tests are reported by the cognizant coordinating QEL for round sub-assemblies and by FMSAEG for the missile rounds. In addition to the above surveillance tests the QEL's perform failure diagnosis on defective rounds returned from the squadrons. The results of these failure diagnoses are incorporated in both QEL and FMSAEG reports.

e. During such special evaluation exercises as "SPARROW shoot" FMSAEG has provided field engineers to assist in the installation of TLM packs,

UNCLASSIFIED

[REDACTED]

UNCLASSIFIED

checkout of the weapon systems on the aircraft before take-off, and the "quick-look" analyses of TLM data during missile captive flights and firings. This service to the squadrons has been particularly well received. Accordingly, in addition to the extensive TLM recording, processing and analysis facilities maintained and operated by FMSAEG at Roos. Rds., P.R., for AFWR; TLM recording and processing facilities (installed in trailers) are currently being maintained and operated, when needed, at Cherry Point; Beaufort, S.C.; and Key West. Another facility is being prepared for use at Oceana and it is expected similar advance base type facilities will soon be in operation in Okinawa and later in the Philippines. Since TLM data is obtained at those sites, actual weapon systems and round performance data can be evaluated under more realistic tactical environments.

f. During the past eighteen months FMSAEG has been developing and is now starting to implement a Serialized Missile Accounting Control System (SMACS) for air launched missiles. Although aimed primarily toward solving inventory and logistics problems, it also will provide valuable information on the configuration of the missiles in use or in the stockpile and their current physical location.

g. Over the past fifteen years that FMSAEG has been collecting, processing and analyzing guided missile quality, reliability and performance data, it has developed a very flexible and versatile digital computer information storage and retrieval system. It is identified as the "VIP" (Variable Information Processing) system and is described in the Technical Memo listed as Item 6, Tab A. It is now being used with FMSAEG's present 2nd generation computer system; IBM 7074 and IBM 360/30. This computer system will be replaced by a third generation computer with much greater capacity and flexibility, during the 4th quarter FY 1969 or 1st quarter, FY 1970.

h. FMSAEG conducts evaluations, correlations and certifications of certain missile round test and check-out systems used in the factories, depots, stations and fleet. To date this effort has been limited primarily to missile sub-assembly test and check-out systems investigations at the factory and QEL levels. A detailed investigation is being conducted now of the SPARROW G&C test equipment used by the NAVAIREWKFAC's and at the Naval Air Stations, and on the Carriers. Additional effort is badly needed to insure adequate test and checkout capability for the aircraft installed system, for all-up missile testing and sub-assemblies as appropriate.

i. Since the beginning of the PIT testing program at Naval Air Station, Point Mugu, FMSAEG has collected the test results from such tests at many other locations and evaluated the data for significant trends. Several reports have been issued by FMSAEG giving the results of the analyses. This program has been conducted on a more or less unofficial basis and should be formalized and made a mandatory requirement so that all aircraft will receive a PIT test prior to any training firing or tactical deployment.

[REDACTED]

UNCLASSIFIED


UNCLASSIFIED

3. In summary, it is recommended that cognizant field activities be tasked and provided sufficient resources to:

- a. Develop and implement an effective trouble/failure corrective action system.
- b. Conduct in-service engineering for each tactical weapon system.
- c. Develop and provide telemetry packs and require their use in all missiles during firing exercises.
- d. Insure telemetry data recording, procuring and "quick-look" analysis facilities are established and operated at all air-to-air missile firing ranges.

Further, it is recommended that the following actions be taken:

- e. Commanding Officers of Aircraft Squadrons equipped with guided missiles be required to submit periodic narrative reports on performance of their missile systems.
- f. Provide additional resources (funds and billets) to FMSAEG to support the fleet support tasks at the level proposed in its FY 1969 budget (see Item 5, TAB A).
- g. Provide additional support as needed for additional resources for the depots, weapon stations, rework and repair facilities, fleet support offices and the quality evaluation laboratories to insure an optimum level of effort on the subject program.


UNCLASSIFIED

~~XXXXXXXXXXXXXXXXXXXX~~ UNCLASSIFIED

TAB VI-A

20 November 1968

LIST OF REFERENCED LETTERS AND DOCUMENTS

- Item 1. SMS INSTR 8810.1A of 4 March 1968
Subj: SMS Proficiency Corrective Action Program
- Item 2. SP INSTR 3100.1B of 1 March 1966
Subj: FEMWS Trouble and Failure Report Programs
- Item 3. NAVAIR INSTR 5400.1A of 27 May 1968
Subj: Engineering functions for designated service equipments:
policy and procedures for delegation: of authority and assignment
of responsibility to field activities for the performance of
- Item 4. NAVORD INSTR 4355.2 of 15 April 1966
Subj: Surveillance program for Navy guided missiles
- Item 5. FMSAEG ltr Ser. E-03-1040 to NAVORD of 25 April 1968
Subj: FMSAEG proposed five year budget plan FY-1969 - 73
for tasks anticipated from NAVORD, NAVAIR, and others
- Item 6. FMSAEG Tech Memo E-3-648 of 15 January 1968
Subj: Variable information processing for digital computers

~~XXXXXXXXXXXXXXXXXXXX~~ UNCLASSIFIED