VERIFICATION DEVELOPMENT PLAN
FOR THE
FAST SPACECRAFT

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Verification Support

1.0 VEO Support to the FAST Project

Providing VEO support to the FAST Instrument and subsystems includes assisting in the writing and review of verification test plans, informing the project of Goodard test requirements and ensuring the requirements are met, attending weekly meeting, scheduling meetings between project personnel and 754 test personnel to ensure special test needs are worked out, etc.

2.0 Provide and Maintain FAST Verification Plan

The FAST Verification Plan will describe the test approach to be used in qualifying the FAST components/subsystems/spacecraft assemblies. The document will outline what tests are to be performed and at what level of assembly. The document requirements will be driven by the Goddard Environmental Verification Specification for STS and ELV Payloads, Subsystems, and Components (GEVS-SE).

3.0 Provide and Maintain FAST Verification Specification

The FAST Verification Specification will describe in detail the testing to be performed to qualify the FAST components/subsystems/spacecraft assemblies. The document will give details of test levels, durations, etc..

4.0 Review Documents Concerning Environmental Tests and Test Levels

Review of verification test plans and procedures will be done for each verification activity. The review will be to ensure all requirements of the Verification Plan and Specification are being met. This review activity will be performed as required for each test activity.

5.0 Generate Task Action Requests (TARS)

The task of generating Task Action Requests (TARs) requires ensuring that a complete and signed off test plan or activity description has been developed by the project such that it is provided to the Environmental Test Engineering & Integration Branch (code 754) for scheduling and to provide a cost estimate. The estimate is reviewed and, depending on the case, discussed with the project to ensure it is understood what the estimate represents and that the costs are acceptable to the project. If the estimates are acceptable, a TAR is written and the work may then be initiated.

6.0 Support POP Exercises

VEO supports POP exercises by providing the best possible verification test cost estimate based on available schedule and test information. VEO coordinates the estimates with code 754.

7.0   Interface to Environmental Test Engineering & Integration Branch (Code 754)

The VEO familiarity with the project requirements and the test facilities provides for an ideal interface between the project and code 754.

7.1   Cost Estimates

VEO will interface with code 754 for cost estimates to support POP exercises or for generating a TAR. The POP exercise requires that the VEO provide a general description of each task required and assumptions made. This differs slightly from obtaining estimates for TARS in that there is generally no test plans to base the estimate.

7.2   Coordinate Test, Integration, and Cleanroom Support

VEO maintains contact with code 754 to coordinate the test facility and manpower needs of the project. VEO must coordinate schedule information and, in the event of a conflict, inform the project so arrangements may be made to resolve the conflict.

Integration Support

CS and Contractor (NSI) integration support is support required for the mechanical integration of the FAST spacecraft. If the personnel of an alternate contractor provides this support then the costs would not be incurred.

Test Support

The cost to perform an environmental test (ie. vibration, thermal vacuum, EMI, mass properties, etc) is composed of 754 civil servant manpower, NSI contractor engineering and technician manpower, and materials charges.

The 754 CS charge covers the effort of the 754 test engineer to coordinate the test time, act as an interface with NSI contractor, review test plans, write test procedures, design or check test fixturing, cover the performance of the test, and complete a final test report. The 754 test engineer is concerned with the test set-up and test performance and is not concerned with test levels, unless exceeding facility capability, or whether the test is required for qualification.

The NSI engineering and technical manpower is the manpower required to set-up and perform the actual test. This activity includes designing and building test fixtures, integrating the test item to the test facility, running the test facility, and supplying the final test reports.

Material costs are incurred when materials (ie. fixtures, LN2, etc.) are required for the test.

750.2 CS Verification Support

Fiscal Year	92	93	94	95	96
Manpower (MY)	0.2	0.4	0.3	0.1	0

Total 1.0 my CS

754 & Contractor Integration Support

Fiscal Year	92	93	94	95	96
754 CS (MY)	0	0.4	0.2	0	0
Contractor Man-Years	0	0.9	0.6	0	0
Cost w/overhead ($k)	0	60	40	0	0

Totals $100k
and .6 my CS

FAST Testing and Test Support

Component	Tests or Effort	Period (Quarters)	Test Cost	754 CS
MUE ETU	vibe, loads, shock, mass properties, thermal vacuum	2-93	$25K	44 MH
Magnetic Torquers	mass properties, magnetics	2-93	$4K	16 MH
Magnetometers	random vibration, mass properties, magnetics	2-93	$10K	32 MH
Nutation Damper	random vibration, mass properties	2-93	$6K	24 MH
Flight Structure	random vibration, loads, shock, sine sweep, mass properties, modal	3-93	$47K	44 MH
Harness	mass properties, bakeout	3-93	$22K	48 MH
IPDU	random vibration, loads, shock, mass properties, EMI, thermal vacuum	4-93	$37K	124 MH
MUE	random vibration, loads, shock, mass properties, EMI, magnetics, thermal vacuum	1-94	$41K	132 MH
Payload	random vibration, loads, shock, sweep, acoustics, EMI, magnetics, thermal balance, thermal vacuum, mass properties	2-94	$122K	416 MH
		TOTALS	$314K	880 MH