Trident II
MK 6 MOD 1 Guidance System

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MK 6 MOD 1 Guidance in Context

Aerospike
Nose Fairing
3rd Stage Motor
2nd Stage Motor
Interstage
1st Stage Motor

MK6 MOD1 Guidance System

Fire Control System

Courtesy: Lockheed Martin SSC

DISTRIBUTION STATEMENT A: Approved for public release: distribution is unlimited.
Draper serves as the Prime for the Trident Guidance Program (MK 6 MOD 0 and MOD 1)
Key Systems Engineering Decisions

- Modular Architecture addressing Life Cycle Costs
  - Parallel path development, integration, test and production
  - Delayed technology decisions until proven readiness
  - Enabled mission flexibility (Alternate Mission Interface; System Expansion)
Modeling and Simulation Based Design

**Computer-only Simulation**

- Modeling and Simulation supported the requirements, concept design, detail design, integration and production phases of the program
- Key driver for parallel integration and reduced need for assets

**Hardware / Software Simulation**

- Hardware in the Loop (HWIL)

**Tactical Guidance System**

- Flight Software
  - ASICS HDL
  - Models
- Flight Software
  - ‘Tactical’ EA
  - IMU Models
- Flight Software
  - ‘Tactical’ EA
  - IMU Models
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Enhanced Ground Testing (EGT)

Test Profiles replicate flight dynamics, event times and event durations

Test Program is defined to match missile dynamics

Dynamic Shaker

Thermal

Vibration

Shock

Stellar

Functional

Electrical Interfaces

Launch Pulse

Angular Rate

Acceleration

Acceleration

Vibration/Shock

Vibration/Shock

Depressurization

Thermal

Launch

First Motion

1st Stg. Ignition

1st Stg. Burn

1st Stg. Sep.

2nd Stg. Sep.

2nd Stg. Burn

3rd Stg. Sep.

3rd Stg. Burn

3rd Stg. Bus Ignition

Aircraft POD

Precision Centrifuge

(Accuracy only)
Embedded Production

– Consolidated Integrated Support Facility for system assembly, test, repair
– Embedded production engineers in the design, integration and test teams
– Embedded integration and test engineers into the production facility

Integrated Support Facility in Pittsfield, MA

Full-range of test facilities
SE Processes Needing Improvement

• Need more agile Independent Software V&V
  – Significant Schedule
  – Significant Cost

• Efficient Risk Management
  – Better definition of classification of risks
  – More representative costing of risk realization