NGIMS Test Scripts

- **Baseline script**

  Establishes entire instrument functional status, 2.5 hours

- **Functional script**

  Shortened form of baseline, 0.5 hour

- **Encounter sequence script**

  Exercises instrument modes that will be used during comet encounter, 3 hours

- **EMC script**

  Generates system noise for RF interference testing

- **TM-On Script**

  Turns on instrument telemetry

NGIMS Instrument Tests

- **3 axis vibration**

    X, Y, and Z axes random and sine

    1.25 times expected launch vibration

    Instrument power off during shake

    Instrument powered on and TM check after each random shake

    Instrument fully tested after each sine shake

NGIMS Instrument Tests, continued

- **Thermal vacuum**

  6 cold cycles at –40°C

  6 hot cycles at +50°C

  Survival heaters and instrument operated during transitions from cold to hot.

  Instrument operated for all cold and hot plateaus.

  Instrument power off for transitions from hot to cold.

  Tests run at nominal spacecraft input of 33.5 V, minimum input of 26 V

NGIMS Instrument Tests, continued

- **Single axis vibration**

    Instrument re-shake after failure in 3 axis vibration

    Launch axis only, random and sine

    1 times expected launch vibration

- **EMC**

    NGIMS fully functional to measure radiation out put

- **Thermal Balance**

    1 cold and 1 hot plateau

    Instrument operated during plateaus and temperature transition.

Test Scripts Used During NGIMS Tests

- **3 axis vibration**

  Baseline Script prior to vibration

  For each axis:

  TM-On Script after random vibration
  Functional Script after sine vibration

  Baseline Script post vibration testing.

- **Single axis vibration**

  Baseline Script prior to test.

  TM-On Script after random vibration
  Functional Script after sine vibration

  Baseline Script post vibration testing.

Test Scripts Used During NGIMS Tests

- **Thermal Vacuum**

  Baseline Script prior to thermal vacuum testing

  Functional Script during cold to hot transitions

  Baseline Script at each plateau

  Baseline Script post thermal vacuum testing

- **EMC**

  TM-On Script as necessary

  EMC Script

Test Scripts Used During NGIMS Tests

- **Thermal Balance**

  Baseline Script prior to thermal balance testing

  Functional Script during cold to hot transition

  Baseline Script at each plateau

  Baseline Script post thermal balance

Discrepancies During NGIMS Instrument Testing

- **3 axis vibration**

  Mechanical failure of one electron multiplier during z-axis vibration.

- **Single axis vibration -** *None*

- **Thermal Vacuum**

  Filament turn off during Ion Modes due to micro sequencer error.

  AMU drift in Round Robin sampling due to incorrect frequency and temperature correction coefficients.

- **EMC-** *None*

- **Thermal Balance-** *None*

NGIMS Testing- Post Spacecraft Integration

- **Post Integration TM checks**

  NGIMS power on and TM-On Script

- **Baseline Script**
- **Functional Script**
- **Spacecraft Performance Test (SPT) #1**

  TM-On Script

  Encounter Script (filaments off)

  Mode Code Test

  Functional Script (filaments off)

NGIMS Testing- Post Spacecraft Integration

- **Baseline Script**
- **Spacecraft Performance Test (SPT) #2**
  - *TM-On Script*
  - *Encounter Script (filaments ?)*
  - *Mode Code Test*
  - *Baseline Script*
- **EMI Test**
  - *Functional Script*
  - *Baseline Script*

NGIMS Testing- Post Spacecraft Integration

- **Baseline Script with Software and Table Upload**
- **CONTOUR Vibration Tests**

  X, Y, and Z axis vibration, random and sine

  ??? Times expected launch vibration

  NGIMS Functional Script run after each axis

  NGIMS Baseline Script run after vibration test complete

CONTOUR NGIMS PRE-SHIP REVIEW

Post Spacecraft Integration Testing Discrepancies

- **Hardware Discrepancies**
  - TM dropouts and un synchronized TM due to spacecraft bit-synchronizer failure- *corrected*
- **Software Discrepancies**
  - Unable to table update in Round Robin Mode- *corrected*
  - Packet data length incorrect- *corrected*
  - System reboot- *corrected*
  - Mode Code Test failure- *understood*
- NGIMS recorded data loss when CIDA, CRISP, and CFI are acquiring data- *action item*