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| Investigation: FIELDS |
| Progress accomplished this period: | July 2014 Reporting Period |
| 1. | Project Management and Product Assurance |
|  | a. | Project Management* Responded to questions from SwRI subcontracts group regarding the review of the July 2013 FIELDS cost change proposal.
* Prepare the GFY15 spend plan (due 08 Aug)
* Supported the following PERs and associated TRRs
	+ TRR for repeat of SDP SNs 2&7 TV test
* Supported the following FRBs
	+ SDP SN3 fine wire crimp
	+ EDI GDU SN9 fold-back during detector characterization, coincident with thunderstorm and building electrical interruptions.
	+ SDP SNs 2&7 boom wire retraction stoppages
	+ SDP SN 7 higher than normal torque in cold TV deployment test
* Supported the following Acceptance Reviews or PSRs
	+ EDI GDU SNs 2&6 Acceptance Review
	+ EDI GDU SN 9 Acceptance Review
		- Not accepted due to badly trending HV channel in the GDE
* Received delivery of the following flight hardware items at UNH
	+ None
* Delivery of the following flight hardware items from UNH to FIELDS partners
	+ EM SCM Sensor (to LPP). Temporary import license closed.
* Delivery of the following flight hardware items from UNH GSFC
	+ SDP SNs 3, 4 & 12
	+ GDU SNs 2 & 6
* Prioritized and coordinated the efforts of the UNH team, subcontractors, foreign partners, outside vendors and in-house workshops to optimize schedule performance.
* Supported processing of NCRs and risks
 |
|  | b. | Product Assurance |
|  |  | Turco / Salwen* EDI FM9 PSR Acceptance review support
* SDP FM2 & FM 7 TV test support
* EIDP Uploading
* SDP 3,4 long term storage testing support
* SDP: FM7 motor harness replacement support
* SDP: FM2, 7 TVAC testing support
* EDI: Clean and pack FM2, 6
* EDI: HVOC life test CTR testing
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| 2. | Systems Engineering and FIELDS I&T |
|  |  | Rau, Dors, Needell* Supported SDP SN07 anomaly investigation
* Supported SDP SN02/07 TV testing
* Supported SDP SN03/04 Life Test Deployments
* Performed GDU SN09 EMI, Magnetics, FIT and Acceptance Test prior to refurbishment decision at Acceptance Review
* Supported GDU SN06, GDU SN02 and GDU SN09 Acceptance Reviews
* Released EMI/EMC test report on SDP SN02 (flight spare)
* Submitted verification material for EDI GDU
 |
| 3. | Post-Delivery Support (UNH) |
|  |  | IS and Observatory Support (FIELDS)* Transported GDU SN02, SN06 and SDP3/4/12 to GSFC
* Installed and tested GDU SN03/06 and SDP SN03/04 onto OBS-1
* Installed and tested GDU SN02 onto OBS-2
* Installed and tested SDP SN12 onto OBS-4
* Supported OBS-1, OBS-2 and OBS-4 operating hours accumulation
* Supported OBS-3 TV test
* Finished development of SDP door deployment procedure for OBS level
* Began development of SDP Sensor Safety Removal procedure for OBS level
* Continued supporting commissioning planning discussions with SOC
* Continued I&T planning for FIELDS at the OBS level
* Supported and reviewed OBS WOA, procedure development and PFR review
* Continued reviewing all test data from previous OBS tests
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| 4. | Science and Science Data Processing  |
|  |  | SWT and SWG * Participation in all science planning discussions.

Science data processing activities (Compiled by Chutter)* ALL
	+ Continued working through coordinate system requirements
	+ Continued working on software to run at SDC
	+ Began discussions on how to use MMS-style CDFs (from Cluster data) to test processes, etc.
* UNH
	+ Continued work on EDI E Field interfaces
	+ Continued review of science and engineering telemetry from observatory level testing
	+ Improved CDF skeleton files
	+ Worked on scripting to control batch science processing
* LPP
	+ SCM L1AtoL1B software delivered to SDC for the MRT9 processing test that includes the desired features:
		- Sensor response (each sensor axis now fits the SCM123 reference frame)
		- Digital and Bessel filters responses checked
		- Warning and error management with corresponding return status
		- Complete log file
* UCLA
	+ Work continues on magnetic field data processing
	+ Developing inflight calibration procedures
	+ Work continues on inflight calibration and procedures
* GSFC
	+ Verified boom alignment data, approved waiver request. Verified that my edits submitted for draft C of the MMS Alignment and Coordinate System Document made it correctly into the released document (this required many iterations…)
	+ Continued working with LANL to finalize format of high level ephemeris files.
	+ Prepared initial version of Magnetometer Calibration Data Flow document. This is an internal document for the Mag team to document and discuss the interfaces between the Mag Conference and the calibration processes that are performed at GSFC, UCLA and Graz, and also the test data that will be used to test these processes and interfaces (e.g. Cluster data).
	+ Finalized routine to calculate spin phase from sun pulse data extracted from 0x101 housekeeping packets. Delivered to the Fields team for consideration.
	+ Created a bare-bones set of geophysical coordinate transformation routines suitable for MMS QuickLook, borrowing the low-level code from THEMIS (TDAS).
	+ Finalized QuickLook (QL) software, including despinning, ‘Parents’ metadata and coordinate transformations.
	+ Deployed L1B and QL software in the SDC sandbox for MRT9c testing. (also a new, but unfinished version of L2pre software).
* IRFU
	+ Continued implementation of functional version of DCV and DCE processes
	+ Clarified implementation of functional version of DCV and DCE processes
* LASP
	+ Discussed interaction between ADP and SDP processing
	+ Working on ADP software
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| 5. | Magnetometers |
|  | a. | DFG  |  |
|  |  |  | * Evaluation of observatory test data
* Continued activities in the frame of EDI/MAG data processing and in-flight calibration
 |
|  | b. | AFG |  |
|  |  |  | Pre-launch Preparations* Code developed for the MRT9c data processing activities.
* Louise Lee converting analysis software to Python.
* Established bi-weekly mag team telecons to develop calibration data flow, and magnetic conference procedures

Post-launch Preparations* Continuing to assess effort requirements to develop and maintain calibration system.

Engineering: Post-delivery Activity* Watching over activities in assessing LM6142.
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|  | c. | SCM | * SCM FMS => SENSOR S/N FM4 + PREAMP S/N FM3
	+ - SCM FMS (sensor, preamp) fully packed and ready for delivery if needed.
		- ADP complete.
		- The EM SCM Sensor was returned to LPP from UNH. Closed import paperwork.
* Final review of the FMS ADP in progress.
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| 6. | EDI |
|  |  | Ship Set 2 - SN2* Acceptance review
* Pre-ship inspections (FIELDS Acceptance Test)
* Delivered to GSFC for integration on OBS 2 (position 2, bay 8)

Ship Set 1 - SN6* Acceptance review
* Pre-ship inspections (FIELDS Acceptance Test)
* Delivered to GSFC for integration on OBS 1 (position 2, bay 8)

Ship Set 4 - SN9* Detector Characterization
* Repeated gun calibration verification test in 145 chamber
* EMC, FIT, Magnetics
* Pre-ship inspections (FIELDS Acceptance Test)
* Acceptance review; it was decided to postpone delivery and replace the GDE with GDE SN4 because of a trending optocoupler. After the GDE swap, the GDU will be re-branded "GDU SN4"

Gun - IWF efforts* Ship Set 4 - SN 4
	+ Root cause for offset on FM4 OPT-DEFL board was not found; decided to switch to Gun SN8
* Ship Set 4 - SN 8
	+ Identified that cause for anomalous resistance is on the BEAM board (PFR 10160.53-133)
	+ Installed new BEAM board, reassembled and tested Gun; installed in calibration chamber; pump-down started

Flight Software* Continued implementation and testing of electric field mode

HV amplifier trend root cause investigations (UNH)* Investigations of root cause for LED current drift observed in Guns continue at UNH with separate tests of the two DEFL boards removed from the SN 4 Gun. We will be wrapping up these tests soon and preparing a briefing of our findings. This has been delayed by the activities associated with SDP testing.
* GSFC continues analysis of 4 LEDs removed from problem HVOCs. CT scans indicated no issues with the construction of the devices. All parts passed DC parametric testing. DPA, underway, is expected to complete 7 Aug.

HVOCs* The 3000-hour life (qualification) test of the 12 UNH HVOC samples is complete. All samples show stable CTR performance. The report is in preparation.
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| 7. | SDP/BEB/LVPS  |

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|  | a. | SDP/BEB/LVPS (KTH/IRFU/Oulu)* All hardware efforts are complete.
 |
|  | b. | SDP (UNH)SDP SN2:* The TV test of SDP SNs 2 and 7 completed on 2 August followed by re-stow of FM2 on 4 August. The results were discussed with the FRB.
* FM2, previously considered the flight spare, is now the designated flight unit, paired with FM8 for Obs-2.
* Subsequent magnetics, FIT and FIELDS Acceptance testing were successful. Both units (FM2 and FM8) were delivered to GSFC 6 Aug for integration with Obs-2 on 7 Aug.

SDP SN7* Higher than usual torque monitor readings near the end of the FM7 cold deployment resulted in suspension of deployment testing of this unit during the TV test. Subsequent completion of the deployment at ambient temperature and pressure was successful albeit with these same higher torque monitor readings. The investigation showed that the wire was free and moving normally in the mechanism. Torque monitor readings returned to normal with a short retraction and were also normal in the subsequent short deployment. FM7 will remain at UNH and is now considered the flight spare.

SDP SNs 3, 4 and 12* These units were returned to GSFC for reintegration with the Observatories following successful post-environmental retesting at UNH.
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|  | c.  | SDP (LASP)* No activity.
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| 8. | ADP |
|  | a. | LASP ADP Post-Delivery Support Activities * Obs #1 – No LASP activity
* Obs #2 – No LASP activity
* Obs #3 – No LASP activity
* Obs #4 – No LASP activity
* ADP WOA closure review
* Supported MMS IS I&T planning teleconferences
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| 9. | DSP, Thermal, Systems Engineering, Product Assurance and Management (LASP) |
|  |  | DSP, Thermal - No activities this month. Systems Engineering and Program Management* Prepared LASP MMS FIELDS FY15 spend plan out through Phase E and submitted to UNH.

Quality Assurance, Parts, and Materials Engineering – No LASP activities |
| 10. | CEB  |
|  | a. | Hardware |
|  |  |  | * No activity. CEB hardware activities are complete.
 |
|  | b. | CDPU Software  |
|  |  |  | * Supported additional Run time ours on all Observatories
* Supported I&T activities as requested
* Supported SDP anomaly investigations as requested
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| 11. | Commissioning and Mission Operations (Needell) |
|  |  | * Continued detailed review of Commissioning scripts with SOC.
* Worked with SOC to test new script review tool - worked well.
* Continued revising I&T scripts for use as Flight Scripts.
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| 12. Problems encountered and updates this period |

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|  |  | SDP* [NEW] Boom wire deployment stopped during cold TV test of FM2 and FM7 (parity error) (PFR-10160.53-144-AP)
	+ There was a wire boom deployment stoppage of SDPs FM2 and FM7 during the 3rd cold deployment segment of the TV test. This was traced to a communication (parity) error that occurred while reading torque monitor data. The SW is designed to stop deployment when this occurs. The subsequent completion of deployment for that segment was normal.
	+ Acceptable behavior. Fully recognizable and recoverable. UAI was agreed to during FRB with UNH, GSFC and SwRI on 08/05/2014. JG 20140806
	+ Residual Risk tracked on IS level.
	+ Will be closed
* [NEW] Increased torque monitor readings near end of cold TV deployment test (FM7) (PFR-10160.53-145-IP)
	+ Torque monitor data prior to this stoppage shows a gradual torque increase spanning several meters and a deployment stop when the torque reached the limit setting of 1.5 in-lb.
	+ Suspended TV deployment testing of FM7 so that it could be studied when the test of FM2 (flight spare) was complete.
	+ With FM2 removed from the TV chamber and the QM BEB in its GSE position, and without touch ing FM7, deployed additional lengths of the FM7 boom wire while observing wire motion. Wire motion seemed normal, but torque values remained in high range (~1.3 in-kb). There ws a torque trip when 1 torque monitor sample read 1.5 in-kb.
	+ Increased the torque monitor limit to 1.75 in-kb. The subsequent 1.1m boom wire deployment to the full 57m length completed successfully alt hour the torque monitor readings remained in the high range (~1.3 in-kb). Wire motion appeared normal.
	+ With the 57m deployment complete, Granoff used a probe to feel the wire coils visible through the slot. These coils appeared normal and could be moved freely. An additional 78cm deployment segment was performed. Again, wire motion appeared normal but the torque monitor readings remained in the same high range.
	+ Four 1-m retractions went smoothly and the torque monitor readings were what we had seen in previous retractions.
	+ A subsequent 4-m deployment to the 57m length was successful with the nominal (lower) torque readings (~0.7 in-lb).
	+ Subsequent full retraction and re-stow completed normally with nominal torque.
	+ Keep FM7 at UNH as flight spare.
* [NEW] Boom wire deployment stopped during cold deployment in TV test (SDP FM2) (EMI-related) (PFR-10160.53-143-IP)
	+ The SDP SN2 boom wire deployment stopped after 5m during the 1st 14-m cold deployment segment (17 July 2014).
	+ A second, similar, SDP SN2 boom wire deployment stoppage occurred (30 Jul 2014) during a second round of TV testing following a change of some of the GSE cables to match the 100 Ohm impedance of clock signals. This impedance mismatch was thought to be related to the cause. IN this case the boom wire stopped deploying on the 1st cold deployment segment after 2m of the 14m segment.
	+ Subsequent cold deployment segments to the full 57m deployed length were all successful.
	+ Analysis
		- Preliminary: Tests with GSE and EM hardware identified disturbances on the LVDS clock lines related to the impedance mismatch of the GSE cables. 100 Ohm cables yield much cleaner clock signals.
		- During second round of cold deployments after changing to 100 ohm cable, FM2 stopped deploying on the 1st cold deployment segment after 2 of 14m.
		- The motor currents, monitored with an oscilloscope during deployments, are observed occasionally to fluctuate. These were more stable using the 100 Ohm cables but were still seen to fluctuate occasionally.
	+ Cause: Interference (EMI) from external sources is suspected but not proven.
	+ Proposed action: None. These events ar fully recognizable and recoverable. Tracked as risk [159] at the MMS level in the PIMS.
* [UPDATE] Boom wire retraction stopped during stowing process (SDP FM7) (PFR-10160.53-138-IP)
	+ The SDP SN7 boom wire retraction stopped during re-stow following successful FFT. The remainder of the stowing operation completed normally.
	+ Symptoms are similar to deployment stoppages observed in TV but included a slight rise in motor current. This feature is consistent with earlier measurements during EMI susceptibility testing.
	+ FRB (6 June 2014) recommended disconnection of the pinion gear and assessment of motor sound in three deployer orientations.
	+ Motor sound testing prescribed by the FRB revealed no mechanical concerns regarding the motor/gear box assembly.
	+ FRB (20 Jun 2014) recommended conduct of a cold TV boom wire deployment of the SN7 as well as environmental testing of the flight spare (SN2).
	+ UPDATE:
		- During TV test, the door and first motion deployments were normal (7/10-15).
		- (7/15-16) During the setup of the GSE for subsequent boom wire deployments there were three stoppages on SN7.
		- An incremental approach was then used. First the CEB was replaced from the silver "MAG" CEB to the black "SDP" CEB. The deployments to the 3m length needed for this setup were completed successfully.
		- 7/17-18: FM7 deployed the full 57 m length of boom wire over the two cold plateaus without any stoppages.
		- 7/21: During the subsequent retraction (at ambient temperature and pressure), a number of stoppages were seen.
		- During a meeting held on 7/18/14, it was determined that the clocks could become asynchronous and cause the motor to become out of synch. This issue would point to the LVDS drivers. It was further noted that the CEB and cabling used during the TV tests were not the same as used in Rm 160 where only 1 stoppage had occurred.
		- It was also noted that 100 ohm cable was not used. 100 ohm cable is used on the S/C flight harness. Not using 100 ohm cable could effect clock time on the LVDS lines to the BEB from the CEB. A comparison was done between the cables presently used in the TV testing and the 100 ohm cable. The slides summarizing this comparison are attached.
		- 100 ohm cable that is used during FIELDS FIT testing was then used. While the clock signal lines looked better, stoppages still occurred during retraction.
		- FRB was held on 7/21: Focus during this FRB centered back to the motor harness assembly. It was agreed to put a spare motor in place to allow retraction to continue for FM2. This retraction occurred without any stoppages.
		- FM7 motor was put back inline to facilitate retraction of FM7 with 100 ohm cable in place, monitoring current signals. Before pluggin the motor back into FM7, a safe to mate was performed. It was found that there was an intermittent short between pin 2, AD590 shield and chassis. Breakout box was kept in place to monitor short during retraction. cable was also flexed and pushed to induce the short. Short could not be replicated and retraction of FM7 was completed.
		- FRB held on 7/22 to update progress. Since the intermittent could not be duplicated it was determined that the best course was to replace the motor cable assembly. This was done 7/23.
		- During inspection of the FM7 motor cable assembly, it was found that the shield wire soldered to the outer braid of the AD590 cable had punctured through the insulating kynar tubing and was contacting the out aluminum tape shield connected to chassis. Pictures of this puncture are attached.
		- Actions
			* Replace the motor/harness assembly on FM7
			* Replace the TV GSE CEB to BEB harness with a new GSE harness made with 100 Ohm cables for the command, data and clock lines.
			* Resume the TV test to include additional hot, then cold boom wire deployments.
		- The TV test (FM7 and FM2) was repeated. Two EMI-related stoppages attributed to FM2 were observed despite the change to 100 Ohm cables,

EDI* [NEW, CLOSED] GDU SN9 MCP Supply Current Red Limit Violations (PFR-10160.53-142-CL)
	+ Two single sample MCP Supply Current red limit violations occurred during the Detector Characterization on July 2, 2014. With the next housekeeping sample the currents were reported as normal again.
	+ Similar observations were made during Detector Characterization with with GDU SNs 1 (PFR-88), 5 (PFR-105), 4 (PFR-117) and 6 (PFR-140). The PFRs on GDUs SN 1, 5 and 4 are closed.
	+ Use as is with residual risk given uncertainty in cause. See FIELDS Risk ID 127.
* [CLOSED] EDI GDU SN9 Converter Shutdown during post-TV detector characterization (PFR-10160.53-141-CL)
	+ A converter shutdown, indicated by a sudden drop of the GDU primary current to 28 mA, occurred during sensor data taking at fixed settings of all GDU high voltages. This occurred during Detector Characterization testing in the room 145 vacuum chamber.
	+ On July 5 there was another event caused by voltage instabilities (flickering lights were observed again by the test engineer). In that case the CIDP simulator appeared to have stopped working. After a packet with invalid ApID no more telemetry was received by the GSEOS server. Telemetry recorded directly from the GDU power supply indicated that the EDI Flight Software safed the GDU subsequently. This is a result of loss of communication (when the periodic message from the CIDP simulator is no longer received).
	+ The UPS was not yet installed on that day. It will be used in all subsequent teting.
	+ Use as is. Accept known condition.
* [CLOSED] GDU SN6 MCP Supply Current Red Limit Violations (PFR-10160.53-140-CL)
	+ Observations
		- Two single sample MCP Supply Current red limit violations occurred during the Detector Characterization. With the next housekeeping sample the currents were reported as normal again.
		- A third single-sample red limit violation occurred on March 28, 2014, also during the Detector Characterization.
	+ There were no subsequent recurrences.
	+ Similar observations were made during Detector Characterization with with GDU SNs 1 (PFR-88), 5 (PFR-105 and 4 (PFR-117). All those PFRs are closed.
	+ Cause: Presumably bit errors on the GDU command link (LVDS) due to electronic noise in the test environment.
	+ Corrective action: None proposed. Use as is.
	+ Status: [CLOSED]. We continued testing of GDU SN6, including TV, without recurrence.
* [UPDATE] Low Beam Current at 500 eV (EDI GDU FM9) (PFR-10160.53-136-OP)
	+ During the first functional test in vacuum (room 105 chamber) of GDU SN9 we did not get enough beam current out at 500 eV. At 1keV things were just fine.
	+ UPDATE
		- FFT retest in room 145 chamber, per FRB recommendation, showed situation at 500 eV was unchanged, and that we now had the same problem at 1keV.
		- Corrective action: FRB recommended replacement of the BGS with the available spare (BGS SN13) and conduct of measurements to assess the impact on calibration.
		- Test of the Gun/GDE SN9 with the new BGS showed adequate beams but a discrepancy of ~3 degrees in the pointing. Subsequent checks of the alignment in the test setup and beam tracing calculations provided evidence that MGSE alignment and the effect of magnetic field could account for the discrepancy. The decision was made to proceed with GDU reintegration and retest.
		- The GDU 9 FFT in vacuum (room 105 TV chamber) showed nominal results except that the azimuthal scan across the hole in the Maheu hat revealed a change of about 2 degrees in azimuth from the test performed with the previous BGS. Approximately 1.5 degree of this change remains after accounting the effects of the magnetic field differences in the 2 chambers.
		- The GDU9 PER recommended proceed at risk. Accept this amount of deviation from IWF calibration and develop an algorithm for in-flight corrections. A separate NCR (PFR-10160.53-139) was initiated and a residual risk (PIMS ID 125) defined.
		- [UPDATE] Cause/Status: Awaits completion of retest of the removed BGS. This is underway at UNH. NCR to remain open pending this investigation
* [UPDATE] Beam pointing deviation relative to the Gun/GDE calibration (GDU FM9) (PFR-10160.53-139-OP)
	+ The FM9 Gun Calibration at IWF is not 100% valid after the exchange of the beam generation system. See PFR-10160.53-136. A pointing deviation of about 2 degrees between the calibration and the actual pointing with the new BGS has been determined in testing at UNH.
	+ Actions (UNH):
		- Prepare the inflight calibration plan for presentation at PSR.
		- Retest in the room 145 chamber
		- Retest (9 Jul) produced similar results
		- [UPDATE]: No further hardware action is possible. Close this NCR with a UAI disposition and track the residual risk and associated mitigations. FIELDS Risk ID 126 has been initiated to assess the residual risk and define mitigations.
* [UPDATE] Upper Injector +140V offset (EDI Gun FM4) (PFR-10160.53-137-OP)
	+ During the functional test of the reintegrated FM4 Gun, IWF measured a+140V offset in Upper Injector. The+140V offset is linear over the full range from 0...2000V. This appears to be a fixed offset, not a gain error. This voltage is provided by a channel in the Gun Optics board (the half board). The test was performed on 12 May and repeated on 13 May with the same result.
	+ The SN 4 EDI Gun was disassembled at IWF to investigate the voltage offset on the Optics board UI channel found during Gun stack testing. The offset was not observed in subsequent board level testing.
	+ IWF has been unable to further isolate the problem. Gun SN4 has bee set aside so that team resources could focus on Gun SN8.
	+ [UPDATE, 8 Aug 2014]: Gun 4 is being returned to UNH with GDE4.
* [UPDATE] Lower than expected impedance measurement during safe to mate (EDI GUN FM8) (PFR-10160.53-133-IP)
	+ During the safe to mate incoming receiving inspection test at UNH, a lower than usual impedance measurement was seen across the +5V line (P5V2) to ground: (800 Ohm versus ~4M Ohm for earlier units). IWF reported also that their incoming test at UNH showed a higher than previously measured and out of family supply current at the P5V2 line. The Gun performance is otherwise nominal
	+ Tests at UNH by UNH and IWF to investigate the cause of the anomaly, including tests in vacuum, have identified possible sources of the problem. Partial disassembly is required to further isolate the problem. The Gun/GDE were returned to IWF for further investigation, rework and recalibration.
	+ IWF has isolated the problem to the Beam Board. IWF will replace the beam board with a new one assembled at UNH.
	+ [UPDATE, 8 Aug 2014]: Gun 8 has been reassembled and tested using the new beam board. The FM8 Gun/GDE calibration is currently underway at IWF.
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| 14. Issues and concerns |
|  |  | From FIELDS PM* The EDI Gun continues to be the critical path for GDU and FIELDS. Commitments of the IWF team to the Solar Orbiter project as well as continued technical problems have made the schedule issue more acute.
	+ The delivery of the Gun/GDE (SN8) is now expected 14 August. UNH is considering GDU SN8 testing and characterization reductions in order to meet Project schedule. These were discussed with the Project early in August. Planning for the integration and test activities, some of which will be conducted on GDU SNs 4 and 8 as a pair, is underway.
	+ UNH provided electronics technician support at IWF in July.
* The risk record regarding GDU performance and schedule (PIMS ID 176, MMS Project) is being used as a tool to help coordinate mitigation efforts.
	+ GDU-specific mitigations are now identified in the risk record.

From FIELDS SE* OBS-3 ADP +Z Boom Canister B-side thermistor is not operational and may be left that way for flight

Science Data Processing Issues (Compiled by Chutter)* ALL
	+ Confusion about use of LANL attitude/ephemeris files and/or software at the SDC, reviewing needs to help SODAWG write statement of work for LANL
* GSFC
	+ In order to finalize the L2pre software, I need direction from Roy as to whether we should still split the AFG/DFG L2pre/L2 data into two separate products
	+ Coordinate transformations work with LANL is slow because they still have no funding for MMS work
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| Activities planned for next reporting period |
|  |  | Management |
|  |  |  | * Prepare contract modifications for U of Iowa, UCLA and LASP based on modification expected from SwRI for FIELDS July 2013 proposal.
* Submit the GFY15 spend plan (08 Aug due date).
* Update the Gun and GDE schedule.
* Continue to review and update the EDI GDU delivery and risk mitigation.
* Continue to push open NCRs to closure. Support FRBs as needed.
* Continue to prioritize and coordinate the work of the UNH team and its FIELDS partners.
* Support/staff T/V testing as needed
* Receive delivery of the following items at UNH
	+ EDI SN4 Gun and GDE (from IWF, 12 Aug)
	+ EDI SN8 Gun and GDE (from IWF, 14 Aug)
* Delivery of the following flight hardware items from UNH to FIELDS partners
	+ None
* Make or coordinate delivery of the following to GSFC IS or S/C teams
	+ SDP SNs 2 & 8
* Prepare and conduct the following PERs and associated TRRs
	+ GDU SNs 4 & 8
* Prepare and conduct the following PSRs or Acceptance Reviews.
	+ SDP SN2
* CDRL and contract deliverable submissions:
	+ None planned
 |
|  |  | Product Assurance, Configuration Management, Parts, Materials, Facilities |
|  |  |  | Turco/Salwen* Continue SDP test support
* EDI GDU FM8 integration support
* EDI GDU FM9 GDE replacement support
* EIDP uploading as needed
 |
|  |  | Systems Engineering & FIELDS I&T |
|  |  |  | Rau, Dors, Needell* Support SDP SN07 anomaly investigation and SDP02/07 FM decisions
* Perform refurbished GDU SN04 EMI, Magnetics, FIT and Acceptance Test
* Continue submitting FIELDS verification material for closure
 |
|  |  | Post-Delivery Support (UNH) |
|  |  |  | IS and Observatory Support (FIELDS)* Transported SDP SN02 and SN08 to GSFC
* Install and test SDP SN02 and SN08 onto OBS-2
* Perform magnetometer boom inspections as available
* Support OBS-1 and OBS-2 penalty Acoustics testing
* Support OBS-1 and OBS-2 ADP deployments and flight close outs
* Support OBS-1 and OBS-2 Mag boom deployments and functional tests
* Support OBS-3 post TV tests including ADP deployments and flight close out
* Support MRT-10
* Finish development of SDP Sensor Safety Removal procedure for OBS level
* Continue I&T planning for FIELDS at the OBS level
 |
|  |  | Science |
|  |  |  | SWT and SWG* Support science telecons as needed

Science data processing plans* ALL
	+ Work on INITIAL versions of software by end of November
	+ Use SPDF tools to verify CDF and skeleton files follow MMS CDF Guide
	+ Work on error and warning management
	+ Support SODAWG
* UNH
	+ Work on real time data display – test run during ADP deploys
	+ Continue working on EDI E Field interfaces
	+ Work on RunEst software (for E Field and mag spin axis calibration)
	+ Continue work on scripting to control processing
	+ Continue L0 to L1 software updates as necessary
* LPP
	+ Analyze the results of the MRT9 data test and correct the software where needed.
	+ [in progress]Test further the SCM calibration software with the new SCM L1A CDF files provided by M. Chutter in Mag123 system (see MRT9 data test).
	+ Include CDF version number computation (vX.Y.Z):
		- X: software version (current=0, increment with used software version)
		- Y: calibration file version (current=0, increment if calibration changes)
		- Z: dataset version (0 is the default, increment if same vX.Y.Z already exists).
	+ ~~L1B data will be delivered in both SCM123 and OMB reference frames as decided on the data processing group meeting, Iowa, March 2014.~~ At first, L1B will be delivered in SCM123 frame only. In case of misalignment, the transformation matrix from SCM123 to OMB will be used and data will then be delivered in OMB only in order to provide less disk space consuming files. So far, this matrix is set to identity: SCM123 and OMB are supposed to be the same reference frames.
	+ Include coordinate transformation from mechanical frame OMB to GSE in L1BtoL2 : interface with K. Bromund’s software as decided on the data processing group meeting, Iowa, March 2014.
* UCLA
	+ Continue developing in-flight calibration procedures
	+ Continue converting analysis software to python
* GSFC
	+ Analyze results from MRT9c test.
	+ Continue work with LANL and DSWG to define for attitude/ephemeris data product and transformation software.
	+ Create MMS-style attitude/ephemeris from Cluster attitude/ephemeris.
	+ Work on coordinate transformation software required for L2 data production.
	+ Work on fully functional L2pre software.
	+ Work out and implement a reasonable versioning scheme for the L1B, QL, and L2pre data products.
	+ Document current understanding of how to modify calibration file: add uncertainties and temperature correction coefficients.
* IRFU
	+ Generate test files using Cluster data
	+ Complete basic functionality of DCV and DCE processes
* LASP
	+ Continue improving DCE software
 |
|  |  | AFG |
|  |  |  | * Continue work on data products guide.
* Continue developing inflight calibration procedures.
* Continue software analysis activities.
* Evaluate data processes tested through MRT9c orbit in the life exercise.
* Determine date of magnetometer team meeting to be held in conjunction with the SWT Meeting (Oct 19?, TBD). Determine attendance at the various meetings to be held October 20-24 @GSFC.
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|  |  |  |  |
|  |  | DFG |
|  |  |  | * Continue support of observatory testing.
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|  |  | SCM |
|  |  |  | * FMS ADP: final review still to be completed.
 |
|  |  | EDI |
|  |  |  | Ship Set 4 - GDU SN4 (was SN9)* Receive GDE/Gun SN4
* Remove GDE SN9 from GDU, and swap in GDE SN4
* Baseline FFT, PER, EMC, FIT

Ship Set 4 - GDU SN 8* Receive GDE/Gun SN8
* GDU Assembly (with Sensor SN4, Lower/Upper Optics SN4, Collar SN8)
* Baseline FFT, PER, Vibe
* Start Detector Characterization

Gun - IWF efforts* Ship Set 4 - SN4
	+ Ship GDE SN4 and Gun SN4 to UNH;
	+ GDE will be used as a replacement for GDE SN9 which has a trending optocoupler
	+ Gun SN4 will be used for a spare GDU.
* Ship Set 4 - SN8
	+ Perform calibration; deliver GDE and Gun to UNH

Flight Software* Continue implementation and testing of electric field mode

Investigation of HV amplifier trends* Continue board level testing at UNH.
* Report findings to Project

HVOCs (UNH)* Prepare and submit the report of the HVOC life testing (12 devices). The 3000 hour program finished in July.
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| --- | --- | --- |
|  |  | SDP/LVPS/BEBs/Preamp/Probe (KTH/ Oulu/IRFU) |
|  |  |  | * Assess the impact of the mismatched probes in FMs 2 & 8 that are now paired on Obs-2.
 |
|  |  | SDP/LVPS/BEBs/Preamp/Probe (UNH) |
|  |  |  | UNH SDP:* Prepare for and conduct the PSR for SDP FM2, formerly the flight spare, now the designated FM to be paired with FM8 on Obs-2.
* Continue root cause investigation of EMI-related deployment stoppages observed in testing at UNH. Note that these events are fully recognizable and recoverable.
* Continue investigation of the cause of higher than usual torque monitor readings observed during cold TV deployment test of FM7.

LVPS* No activity planned
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|  |  | ADP/SDP/DSP (LASP) |
|  |  |  | QA/Parts/Materials – No activities plannedDSP – No activity plannedADP* Obs #1 ADP functional testing and final closeout at GSFC
* Obs #2 ADP final closeout at GSFC
* Obs #3 ADP functional testing and final closeout at GSFC
* Obs #4 ADP functional testing and final closeout at GSFC

AEB – No activity plannedSDP* No activity planned.

Thermal* Perform thermal analysis of ADP preamp in deep eclipse

Systems and Program Management* Support project as needed.
 |
|  |  | CEB Hardware and Software |
|  |  |  | * Support SDP reintegration activities
* Support I&T activities as requested - many boom deployments planned.
 |
|  |  |  |  |
|  |  | Commissioning and Mission Operations (Needell) |
|  |  |  | * Continue Commissioning and MRT17 planning with SOC
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|  |  |  |

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