

Virginia Tech Input*

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**LWA Meeting @ UNM
Jan 13, 2009**

*** Responses to questions assigned in “January LWA Workshop Agenda Ver. 4”, Dec 22, 2008**

MCS

- (56) What work will remain on MCS beyond the scope of VT's efforts?
 - See MCS0004 (Dec 18, 2008)
- (57) What is the plan for monitor/control (software) ICDs?
 - See MCS0005 (Dec 31, 2008)
- (58) What is the schedule for MCS?
 - Not a reasonable question due to past history of funding halts plus possible additional funding halts in Mar 2009 (FY07 funds) and Sep 2009 (FY08 funds).
 - MCS is very low risk. If funding halts can be avoided, I guarantee that MCS will never be a pacing item.

MCS

- (59) What will be the physical hardware required for MCS?
 - See (60) and (61)
- (60) What is the estimated power consumption for MCS?
 - 3 PCs; est. 600W each
 - 2 1GbE managed switches; est. 100W each
 - Total power: 2 kW (110VAC)
- (61) What is the parts cost estimate for MCS?
 - Pile-of-parts estimate from Memo 45 (\$10K) is still valid. This includes:
 - 3 PCs averaging \$2K each = \$6K
 - 2 GbE managed switches averaging \$1.5K each = \$3K
 - \$1K for TCD interface hardware, cables, power strips, cable mgmt, rackmount hardware (but NOT the rack(s) themselves)

MCS

- (62) What are the observation timing requirements/definitions?
 - Not exactly sure what this means
 - System-level requirements should be resolved at the Project Office level
 - Ref. extensive email discussion about this (primarily between Ellingson and D'Addario, Dec 7-10)

MCS

- (63) What remains to be completed on MCS for PDR?
 - Per “LWA1 PDR Documentation Requirements” (J. Craig, Jan 7, 2009):
 - Functional block diagram and MCS architecture.
 - Exists, needs to be documented
 - Message structure and interfaces defined.
 - Done (only minor revisions expected): MCS0005.
 - Cost estimate and schedule/timeline for fabricated parts and materials.
 - Cost estimate: Done: See (61)
 - Schedule/timeline: See (58)
 - Electromechanical interface and power requirements specified.
 - Comm interfaces: Essentially done (MCS0005)
 - Power interfaces/requirements: Essentially done; See (60)
 - Form factor / installation: Done to PDR level (see next).

MCS – Other Topics

- (Not asked) How much physical rack space will be required for MCS?
 - 3 sideways-mounted tower cases; allow 6U each (conservatively)
 - Make it 4 to account for cable/power/heat mgmt, so not more than 24U

MCS Interim Data Recorder

- (64) How will data be recorded and played back?
 - MCS0004 (Section 3)
- (65) What is the cost estimate for data recorders?
 - Essential: \$12K (assumes data arrives from DP as GbE)
 - 5 PCs @ \$2K each = \$10K
 - 10 additional GbE NICs @ \$30 each = \$0.3K
 - 5 additional TB-class internal HDDs @ \$140 each = \$0.7K
 - \$1K for cables, power strips, cable mgmt, rackmount hardware (but NOT the rack(s) themselves)
 - Optional/Recommended: LTO4 tape drives (800GB per tape): \$18K
 - 5 drives (1 per PC) @ \$3K per drive = \$15K
 - Initial supply of 100 tapes @ \$30 each = \$3K
 - External USB HDDs would be provided by users or Project Office

MCS Interim Data Recorder

- (66) How much physical rack space will be required for data recorders?
 - 5 sideways-mounted tower cases; allow 6U each (conservatively)
 - Make it 6 to account for cable/power/heat mgmt, so not more than 36U.
 - Does not account for LTO drives and external USB drives; those need to go where users can easily reach them.
- (67) What is the schedule and cost estimate for data recorders?
 - Cost estimate: See (65)
 - Schedule: See (58)
- (68) What remains to be completed on data recorders for PDR?
 - See (63)

MCS Interim Data Recorder

- (Not asked) What is the estimated power consumption for MCS-DR?
 - 5 PCs; est. 700W each = 3.5 kW
 - 5 LTO tape drives (if used); est. 35W each = 175W
 - Total power: 3.7 kW (110VAC)

Additional Backends

- (74) What additional backends are being planned
 - I am not aware of any.
- (75) What interfaces will be provided for these backends?
 - MCS0005 is current/draft “MCS Common” ICD
 - Other interfaces (DP, TCD, PCD, etc.) are Project Office responsibility to identify/assign.
- (76) What is the cost estimate for the backends?
 - See (74)
- (77) What remains to be completed on additional backends for PDR?
 - See (74)

Station Level Calibration

- (78) What is the plan for station calibration?
 - SLC0010 demonstrates that reasonable beams can be formed with geometrical delays alone. Therefore, the primary goal of SLC has become sufficiently-accurate determination of instrumental delays. This can be determined crudely from installation, and refined/monitored by analysis of the sky data. Thus, it currently appears that beacons and other aids will not be necessary.
- (79) What is the plan for the outrigger interferometer (if required)?
 - Not required for SLC. (This should be a “Commissioning” question)
- (80) What remains to be completed on SLC for PDR?
 - Quoting from “LWA1 PDR Documentation Requirements” (J. Craig, Jan 7, 2009): “Design and Performance Analyses to show requirements can be met. Simulation, mathematical models and/or hardware testing results will be provided to demonstrate the subsystem’s performance as related to the system technical and science requirements.”
 - This is in progress