



MEOSAR D&E Update and Plans for Early Operational Capability (EOC)

Beacon Manufacturers Workshop
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MEOSAR Demonstration and Evaluation Testing Phase II Update



- Phase II Testing Completed (April 2014 – July 2015)
- Correspondence Working Group has been tasked with drafting the Phase II Report
- Preliminary Draft version of the Phase II Report presented to CSC-55
- Still waiting on inputs from some participants for sections 3 and 4 (Results) as well as drafting section 5 (Conclusions and Recommendations)
- CWG hopes to complete work by/at JC-30 and have a Phase II Test Report to CSC-57 for approval



MEOSAR D&E Phase II Results

- Generally good results for the USA MEOLUTs.
- O-1 largely confirmed the time advantage that MEOSAR will provide in detection and independent location
- O-2 demonstrated numerous detections and independent locations that *were not received* by the operational LEO/GEO system.
- However, there were numerous single burst detections of anomalous / suspect data. *MCC procedures have* been added to filter out this suspect data.



MEOSAR D&E Phase II Results from T-4 Re-run at FL MEOLUT

Single-Burst Locations:

Beacon	<5 km	<10 km	<15 km	Pr(location)
Florida (37dBm)	0.59	0.87	0.95	0.82
Maryland (37 dBm)	0.60	0.87	0.95	0.73

Merged Locations from the Florida MEOLUT Data using Florida Beacon Simulator:

NB	<1 km	<5 km	<10 km	Probability of location
1	0.05	0.59	0.90	0.84
2	0.07	0.70	0.93	0.87
3	0.08	0.74	0.93	0.89
5	0.11	0.76	0.93	0.92
7	0.13	0.80	0.95	0.92
13	0.15	0.82	0.94	0.95



MEOSAR D&E Phase II Results from T-4 Re-run at FL MEOLUT

Merged Locations from the Florida MEOLUT Data using
Maryland Beacon Simulator:

NB	<1 km	<5 km	<10 km	Probability of location
1	0.05	0.58	0.86	0.67
2	0.11	0.71	0.87	0.77
3	0.09	0.70	0.88	0.81
5	0.12	0.79	0.94	0.82
7	0.14	0.81	0.96	0.88
13	0.22	0.83	0.96	0.91



MEOSAR Early Operational Capability (EOC) Update

- The use of the existing 19 DASS satellites and the on-orbit Galileo satellites for an EOC has been a Cospas-Sarsat milestone for the current operational space segment's risk mitigation
- EOC commissioning test runs have been completed May 3rd – May 10th for the Florida MEOLUT
- Both FL and MD reference beacons were used to run commissioning scripts.
- Analysis still underway but preliminary results are positive and should meet all EOC requirements



MEOSAR D&E EOC Criteria

- Single-burst probability of location shall be **75%**, instead of 90%.
- Single-burst location accuracy shall be **70%** within 5 km, instead of 90% within 5 km, and **90% within 10 km**.
- Multi-burst location performance shall be measured over 20 minutes rather than 10 minutes. That is, probability of location shall be 98% within **20 minutes** and location accuracy shall be 95% < 5 km and 98% < 10 km, within **20 minutes** after activation.

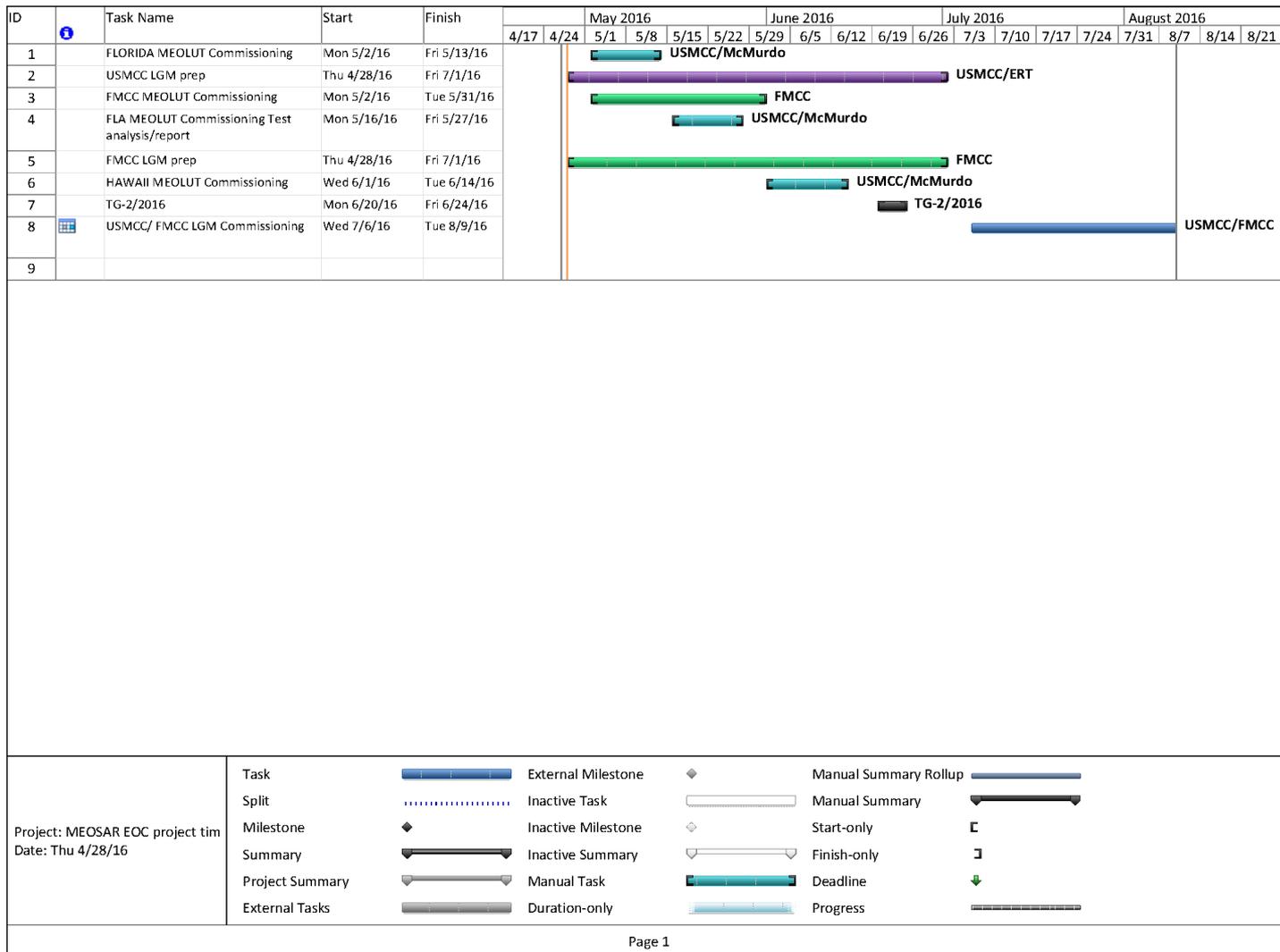


MEOSAR EOC Plans

- The US plans to present results to TG-2/2016 and have the FL MEOLUT commissioned as a “stand alone” MEOLUT by June 2016
- Hawaii MEOLUT EOC testing to begin early June 2016
- Networked EOC commissioning testing to begin after FL and HI “stand alone “ testing is completed
- Expect to have both FL and HI MEOLUTs commissioned by early July
- Intend to commission the LEO/GEO/MEO MCC by early August but dependent upon FMCC availability (who is also commissioning their MEOLUT)



Current Project Timeline





MEOSAR EOC Results/Analysis

- Analysis of operational cases since March 2016 (LEO/GEO MCC) with MEO MCC data is proving the timeliness and accuracy advantages of MEO over LEO/GEO.
- March 2016 date corresponds to FL MEOLUT software and hardware operating nominally.
- Report being prepared with O-6 analysis for inclusion with D&E Phase 2 report to be reviewed at JC-30. This analysis shows the direct and indirect benefit of the MEOSAR system.



MEOSAR EOC Results

Probability of Location

- **Single Burst**
 - EOC Requirement: 0.75
 - FL Beacon: 0.92
 - MD Beacon: 0.88
- **20 Minute Window**
 - EOC Requirement: 0.98
 - FL Beacon: 1.00
 - MD Beacon: 1.00



MEOSAR EOC Results

Location Accuracy – Single Burst

	< 5 km	< 10 km	Probability of Location
EOC Requirement	0.70	0.90	0.75
Florida Beacon	0.75	0.96	0.92
Maryland Beacon	0.72	0.95	0.88



MEOSAR EOC Results

Location Accuracy

– 20 Minute Window

	< 5 km	< 10 km	Probability of Location
EOC Requirement	0.95	0.98	0.98
Florida Beacon	0.997	1.000	1.00
Maryland Beacon	0.988	0.996	1.00



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