GOES-R PS-PVR Chair Disposition Form

Product Validation Level

- [x] Beta
- [ ] Provisional
- [ ] Full Validation

Date: 05/25/2017

Algorithm

- [ ] ABI L1b/CMI
- [ ] EXIS L1b
- [ ] GLM L2
- [x] MAG L1b
- [ ] SEISS L1b
- [ ] SUVI L1b

1. Review Board Comments

The Exec Board congratulates the MAG CWG on reaching beta maturity validation and our appreciation for a tremendous level of effort by the CWG/Flight/Ground/Lockheed and all who supported the deep dive to understanding MAG in-orbit performance to date. Kudos to Paul Loto'aniu for a well organized and thoughtful briefing. We hear from the users that MAG is the second most used continuity space physics data set (after solar wind), from decades of GOES measurements and deserves the attention it has received and will need to receive to meet the expectations of the domestic and international space weather community. There is great demand for MAG by users. MAG is used for model validation, and the data are the most fundamental validation data for GeoSpace models. Determine impact on downstream internal users at NOAA-SwPC and external-Air Force and international satellite operators. In addition, we understand there is product dependency on MAG for SEISS to achieve Provisional Validation. If the more recent April MAG measurements were to hold over the coming months then it appears this dependency will be sufficient to support SEISS Provisional validation. For MAG there is still a great deal of analysis needed to reach Provisional Validation and some of this is underway. With the beta MAG data release even to a limited community of users, we recommend PRO and CWG first work together to develop the strong caveat language with the release of the data. We recommend that the DO.06 build includes the coordinate transforms necessary for SEISS and whatever SPADES may need. NCEI will need to create a helpful "users' guide" that will describe the problems. Examples, plots, etc. PRO can help. We may need to listen to user feedback and iterate. Feedback from super users such as JHU APL and others for example could put more fresh eyes on the MAG performance assessment and feedback.

There is a long list of changes in the pipeline including bug fixes to the Harris GRA implementation to help CWG in the data

Approval Status

- [x] Approved
- [ ] Conditionally Approved

2. If conditionally approved, list actions required to become approved.

	PS-PVR Chair	Signature	Date
Conditionally Approved			
Approved	Steven J. Goodman	GOODMAN.STEVEN.J.1365862652 Digitally signed by GOODMAN.STEVEN.J.1365862652 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=GOODMAN.STEVEN.J.1365862652 Date: 2017.05.26 09:58:11 -04'00'	05/26/2017

3. Other Notes

MAG- 1.7 nT accuracy performance requirement (waiver from 1 nT) in a 100 nT ambient field.

A lot of hard work here. April data would be sufficient for SEISS dependence to also achieve Provisional- Body Ref Frame needed to get pitch angle data..

Unexpected artifacts immediately with boom deployment.
Slide 15- the post launch observed mag strength greatly exceeds pre launch prediction, and the outboard MAG is much larger SD than inboard which was a surprise. Large bias indicates possible strong DC magnetic field contamination. A 70 nT SD is 70% of the ambient field.
Although the maneuver biases shifted MAG values close to GOES-13, the variations in the bias estimates are outside the 1.7 nT at 100 nT field performance requirements and this suggests the biases are not stable either diurnally or throughout the year. GPA LUT biases vary over time and will need to be updated on Path to Provisional. Annual maneuvers recommended.
Slide 20- recommendations for S, T, U modifications.
Slide 27- Temperature compensation is wrong. Recommend turning off in DE - For temperature compensation, we further recommend that compensation be turned off in the L1b GPA in the development environment for some weeks and output compared to the temperature compensated data from the operational environment L1b data.
Slides 30-31, MAG-03, Arcjet firing effect on data not usable for 90 min every 4 days.
Slide 33- Significant levels of interference are observed in the GOES-16 MAG L1b data. The interference/contamination levels are more than seen in current and previous GOES magnetometers. PLT Failed. Studies are still ongoing to quantify the resulting increase in noise due to the interferences. Although we cannot quantify the total degradation at this point, it is certain that the L1b data will not meet the 0.3 nT noise level requirement.
Slide 36- important showing ratio of OB and IB.

Slide 37- Looking forward:
Our biggest concerns here is that the variations in the ratios/differences between the two MAG are due to both MAGs being contaminated rather than just one MAG.
We recommend a study to determine how much each MAG contributes to the ratio/difference variability.
Furthermore, we recommend that at least one year of calibrated L1b data be collected and analyzed before MAG is made operational. This will allow us to determine the variation between the two MAGs over all sun angles.
Slide 38- Summary slide
Provisional Path Forward- MAG OB in April looks reasonable but low confidence for stability of the measurements from both OB and IB throughout the year and life.

Path to Provisional-- MAG CWG believes Provisional possible by November. Trending biases and variability a high priority and need many more months of data.
How many on the suggested To DO list are underway or planned by Flight/Ground? Go through the Recommendation summary list.

Path to Provisional- what is the design of the experiment to compare G13 and G16 in November when G16 moved next to G13? Recommend a plan be developed- what would you learn? Could this be done in a week or less of data collection?
Users-GOES MAG legacy the most widely used space physics data after Solar Wind. Great demand by users. Used for model validation, most fundamental validation data for GeoSpace models. Determine impact on downstream users internal NOAA-SwPC and external-Air Force. Desire how close can the satellites be and for how long < 15 deg, min 1-day for diurnal cycle.

Rodney- Path to Provisional has unknowns. Rob says we need to understand what is the root cause of the problems. Rob unclear on what the Path to Provisional is. Paul put out a lot of good practical ideas. Support all of them. In particular a maneuver calibration paying code time to a non varying magnetic field, Lockheed improve Cal code.

Matt- Paul did a great job with a clear explanation of where we stand. Users- GRB community. Characterize with strong caveats on the data to users- PRO cooperate with CWG.