



SCIENCE

PSD Update

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OPAG Meeting
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PSD Updates



- Discovery AO proposal evaluations are underway
- PSD personnel changes
 - Tom Wagner has taken over as the Lead Program Scientist for Discovery
 - Kate Wolf is finishing her detail as the Deputy Division Director for PSD; hiring a permanent deputy is underway
 - Joan Salute is acting as the Associate Director for Flight Programs in PSD
 - Finalizing the hiring of new Program Executives
- Clipper personnel changes
 - Project Manager Barry Goldstein is retiring and Jan Chodas is taking over for him
 - Dave Lavery is taking over as Clipper Program Executive for Joan Salute
 - Mission Manager Brian Mulac has been promoted to Deputy Director of the Planetary Missions Program Office at MSFC



Europa Clipper has been Confirmed!!



- Delta PDR held in June with very positive feedback from the SRB
 - “The team has made a lot of progress since PDR”
 - “Europa Clipper is being led by an extraordinarily competent and committed group of people...”
 - Issues “are being addressed effectively and therefore represent a lower risk to schedule and cost”
 - Triggers “successful in its intent” and “should be assessed critically to improve it”
 - “Good progress staffing to required levels”
- This spurred the necessary meetings at HQ leading to a successful KDP C in early August!!



NASA Response to OPAG Findings (1 of 13)



- Finding 1: OPAG invites NASA to further engage the community to raise the transparency on the ICEMAG termination process at the next OPAG meeting. In particular, we suggest that NASA present to OPAG the termination rules-and-procedure* briefing that was given to the Europa Clipper leadership group, and inform us how the ICEMAG termination process is being reviewed and what lessons have been learned.
- NASA Response: SMD recognizes there is room for improvement but notes the concept is widely viewed as necessary and successful. At KDP C DPMC we took an action to consider improvements to the concept and report back in six months. The project also has a Delta PDR RFA on this topic. Curt Niebur will be presenting information on the process at the August 2019 OPAG meeting, and community suggestions can be sent to him.



NASA Response to OPAG Findings (2 of 13)



- Finding 2: OPAG requests NASA to explain the implications of a potential new start for Mars Sample Return for the next Decadal Survey.
- NASA Response: The Decadal Survey Midterm Assessment recommended that “NASA should continue planning and begin implementation of its proposed “ocused and rapid’ architecture to return samples from the Mars 2020 mission to achieve the highest-priority decadal survey flagship-class science for consideration for the next decadal survey.” NASA is taking the “lean and focused” approach very seriously. The MSR strategy is singularly focused on returning the Mars 2020 samples and we are working to leverage international partnerships.



NASA Response to OPAG Findings (3 of 13)



- Finding 3: OPAG requests NASA to develop and publicly share a clear process for terminating mission funding that involves time for collaborative, thoughtful discussions between the project and NASA HQ before final decisions are made. This process should include an evaluation of lost science and the development of a smooth transition plan. This plan should strive to minimize science loss, impact on young scientists, and loss of critical science data products.
- NASA Response: This finding describes our standard PPBE budget process held each spring. Situations sometimes arise that force us to make unanticipated decisions outside of that process, and the Cassini decision was one of them. After discussion with the project, an additional \$1.8M was provided to alleviate hardship for team members in precarious employment positions.



NASA Response to OPAG Findings (4 of 13)



- Finding 4: OPAG requests that NASA involve members of the planetary science community in the formulation of the Decadal Survey Statement of Task, and provide opportunities for the community to give feedbacks about the Statement before the Statement is finalized. OPAG also encourages NASA to define the scope of the Survey by explicitly including processes/workings to ensure that the important goal of comparative planetology is accomplished.
- NASA Response: PSD has reached out to the community through the AGs to solicit input that will be considered when crafting the panel structure and task statement. A self-organized group of planetary scientists recently met with PSD to offer their analysis and input.



NASA Response to OPAG Findings (5 of 13)



- Finding 5: Juno Participating Scientists
 1. Given that about 10 Juno PS proposals were selectable, OPAG requests the timely selection of additional Juno PS proposals from those that were considered selectable by the review panel.
 2. OPAG requests insight into where the additional funds allocated for the Juno PS program were used (were the funds given to the Juno mission for instance, or used for some other program?)
 3. Given the Juno PSP experience, OPAG requests NASA to review the PS process, from the draft AO through selection, to improve the implementation of the PS process in general, including a timelier PS announcement after the proposal review process. Some key items for consideration include involving the project in identifying specific investigations to list in the AO that would enhance the mission science.
- NASA Response: An additional 9 Juno participating scientists were selected in June for a total of 12. PSPs use the same generic process as all R&A programs, and flexibility is needed to meet each mission's unique needs.



NASA Response to OPAG Findings (6 of 13)



- Finding 6: OPAG joins several other NASA Assessment Groups in strongly advocating that NASA open the New Frontiers program to all mission concepts that address high-priority science questions from the Decadal Survey in time for the NF5 call.
- NASA Response: PSD understands from previous OPAG findings that this is something OPAG supports. There are sound reasons why the previous Decadal Surveys recommended a limited list of mission candidates, and these reasons must be addressed as part of a cogent argument before a decision is made.



NASA Response to OPAG Findings (7 of 13)



- Finding 7: OPAG supports the early definition of Planetary Protection requirements for future outer planets missions, in particular those that will study Ocean Worlds, and encourages the Planetary Protection Office to establish a process that engages the science community in the definition of PP standards and bioburden and other risk assessments in order to enable the search for life in our solar system.
- NASA Response: The Planetary Protection Office was moved from SMD to Office of Safety and Mission Assurance, so it would be most effective to engage them directly. PSD suggests inviting Dr. Lisa Pratt, the Planetary Protection Officer, to a future OPAG meeting for detailed discussions and/or to start a collaborative working group.



NASA Response to OPAG Findings (8 of 13)



- Finding 8: OPAG requests that NASA commissions a professionally conducted workplace climate survey for the Europa Clipper Project within the next six months, and periodically conduct surveys for each of the other NASA planetary science mission projects to monitor the workplace environment. NASA should use the survey to identify and quickly address workplace climate issues to reduce risk to mission success, improve the mission team workplace environments, and identify and replicate best practices.
- NASA Response: PSD agrees that this would be a valuable activity for all missions in development and operation and is considering its implementation. PSD suggests that OPAG create a working group and by the end of October provide NASA with suggestions on content.



NASA Response to OPAG Findings (9 of 13)



- Finding 9: OPAG thanks NASA for supporting Dr. Rathbun's work on EDI, and requests NASA to implement the following:
 1. OPAG urges NASA to continue to make resources and funding available in the upcoming fiscal years to study barriers to participation in the planetary science workforce.
 2. OPAG encourages inclusion of EDI as a study topic in the upcoming Planetary Science Decadal Survey.
 3. OPAG urges NASA to continue their efforts to enhance workforce diversity along multiple axes. These efforts should include, but are not limited to, initiatives that support gender diversity, and establish programs to broaden participation of ethnic and racial minorities who are extremely underrepresented in NASA-funded science communities and in the planetary science workforce.
- NASA Response: PSD agrees that this is an important topic and looks forward to seeing the results from Dr. Rathbun's efforts. Regarding 1), researchers are able to submit unsolicited proposals to NASA on a wide variety of topics, including this. Regarding 2), this can be done as part of Finding #4. For 3), PSD welcomes community discussion and input on this topic.



NASA Response to OPAG Findings (10 of 13)



- Finding 10: OPAG applauds the spectacular success of the Cassini mission at Saturn and asks NASA to adequately support and increase CDAP funding to ensure optimum science output from this mission. In addition:
 1. In the coming years, augmentation in the CDAP budget is needed to take full advantage of the rich, high science-value data set returned by the Cassini mission and to prepare for future outer planet missions, especially those to the Saturn system. CDAP funding is especially needed for the development and archiving of critical higher-order science and engineering data products, specifically those related to the final year of the mission, which will aid future scientists in the analysis of Cassini data.
 2. Cassini, with its 13 years of archived Saturn system data, should have a continued dedicated data analysis program for many years to come...
- NASA Response: As stated at the last meeting, CDAP enjoys one of the higher selection rates among R&A programs. There is no data to suggest a budget augmentation is needed for CDAP. For 2), PSD agrees, and as PSD has stated repeatedly, CDAP is included in the budget for the duration of the planning horizon (5 years).



NASA Response to OPAG Findings (11 of 13)



- Finding 11: OPAG advocates maintaining the robust and synergistic scientific payload of the Europa Clipper Mission. NASA should ensure that scientific priorities drive any decisions that might affect the payload complement and its functionality. OPAG continues to support the earliest feasible arrival date for Europa Clipper, to ensure a healthy Outer Planets program. OPAG encourages NASA to add a gravity science team to the mission, to ensure success in achieving this top-level priority to confirm and understand the ocean
- NASA Response: PSD agrees that our goal should be to preserve the Clipper payload and overall mission science return but notes that science is not the only consideration when making difficult decisions. PSD plans to release in the near future a competitive opportunity to select new gravity science team members.



NASA Response to OPAG Findings (12 of 13)



- Finding 12: OPAG would like NASA to request that the National Academies assess the science value of an Ocean Worlds exploration program and how it fits in with broader solar system exploration. This NAS assessment, provided as input at the start of the Planetary Decadal Survey process, will allow the Survey panels to consider the results as part of their deliberations.
- NASA Response: This finding originally arose from the Feb. 2017 OPAG meeting, and at the Sept. 2017 meeting PSD responded “NASA would like OPAG’s opinion on the pros and cons of a standalone National Academies study on this topic vs. relying on the Decadal Survey to address Ocean Worlds science and priorities.” PSD did not receive anything from OPAG in response.



NASA Response to OPAG Findings (13 of 13)



- Finding 13: OPAG strongly supports an Ice Giant System Flagship mission as the scientifically compelling, next logical directed mission after Europa Clipper. OPAG prioritizes the Neptune system as the mission's target, and finds there is a need to begin work prior to 2020 due to trajectory concerns for reaching Neptune that require a launch date in the late 2020's. OPAG encourages NASA to rapidly advance its discussions with ESA so that a high-level mission architecture and target can be selected. OPAG also encourages continued, rapid advancement of HEEET and next generation RPS technologies, and maturation of aerocapture techniques, as these can significantly enhance the science return of an ice giant mission.
- NASA Response: NASA continues working with ESA on their Ice Giants mission study, which will inform an important ESA meeting this winter. STMD is creating a sustainment plan for HEEET and has ended support for further maturation of ADEPT. A briefing on RPS is slated for the next OPAG meeting.



Mission Cost Control (i.e., Triggers)

The following slides are from the presentation given to CAPS in March 2019



Background

From July 2017 SMD Meeting



- Due to unexpectedly large instrument cost growth (52%) in Phase A, KDP-B Action from APMC
 - *"Prepare a de-scope plan for Europa Clipper. Due by end of FY'17"*
- As we are currently still within the cost range from both KDP-A & KDP-B, PSD direction to the Project
 - Develop a process by which we can monitor cost growth of each instrument and execute de-scopes (in part or in total) to maintain cost control
- Progress to date
 - Development of Cost 'Triggers' for each instrument and a monitoring/action plan
 - Development of tool (P-STAF) to analyze each instrument's contribution to required measurements and the ability for 'what if' scenarios
 - PI generated options for de-scopes on their own instruments
 - Other cost saving de-scopes have been identified
- *Need to discuss any additional requirements and plan to close APMC action by end of FY 17.*



Instrument Cost Trigger

From July 2017 SMD Meeting



- a) The Project has assigned each Instrument a cost number (Phases A-D), deemed the “Cost Trigger” to determine when action needs to be taken to assure that the instrument maintains cost control.
 - Scope growth imposed on instruments from other areas within the Project as determined by the PM will raise the instruments “Cost Trigger”.
 - Any approved lien that falls under this category will increase the trigger amount by the dollar value of the lien.
- b) If the Project has determined that an instruments Cost Trigger will be reached the individual instrument (PI/IM) will evaluate and implement de-scope actions that can be taken to reduce cost without impacting level-1 requirements.
- c) If no action can be taken to reduce the instruments A-D cost below the Cost Trigger without impacting level-1 science requirements as determined by the Project Scientist, then the Project Manager will assess the current budgetary situation and determine if the instruments Cost Trigger should be raised by encumbering Project UFE.
- d) If the answer to step c above is no, or the PI does not take action as described in step b above, a mandatory discussion on instrument de-scope(s) / performance reduction will be conducted.
 - Mandatory Participants: Principle Investigator, Project Manager, Project Scientist, Program Executive, Program Scientist, Mission Manager, Payload Manager and Project Business Manager
 - The outcome of this meeting shall be either a path to an instrument de-scope(s), or an action at HQ to schedule a Directorate level PMC to either request use of HQ held UFE or a modification to the Level 1 requirements accepting reduced performance.

- In May 2019, we clarified the timeline in d) as follows:
 - Meeting with the PE, PS, and MM occurs within 1-2 months of exceedance
 - Meeting with DD occurs within 3 months of exceedance
 - Meeting with AA occurs within 4 months of exceedance
 - Final decision by AA NLT 7 months after exceedance



Determining Initial Trigger Values

From July 2017 SMD Meeting



- Current best estimate at MDR less anticipated payload reductions/opportunities from September 2016 HQ meeting
 - These numbers include either ROMs or bottoms up estimates from Phases C/D
 - *Plus 20% of expected obligations to go* from end of Fiscal February, 2017
 - Plus any unrealized cost savings from the reductions/opportunities identified at the September 2016 HQ meeting plus 20%
 - If an instrument saves more than expected from said reduction, they have more than 20% above cost to go to the cost trigger
- All Initial Trigger Values were discussed with, and accepted by the PIs

- Assumed 30% cost growth above MDR CBE for phases A-D, and Triggers were set to 20% to allow time to resolve the concern of hitting the trigger.
- 30% cost growth is equivalent to 95% cost growth from the proposed A-D CBE (after compounding is considered)



Monitoring

From July 2017 SMD Meeting



- Data from Monthly instrument reviews used to update 'the value of the cost headroom as well as of a percentage obligations to go' on a monthly basis
- Presented to PE and MM monthly
- Any changes discussed with PI monthly

- Presented to HQ (PE, PS, MM) monthly



Process

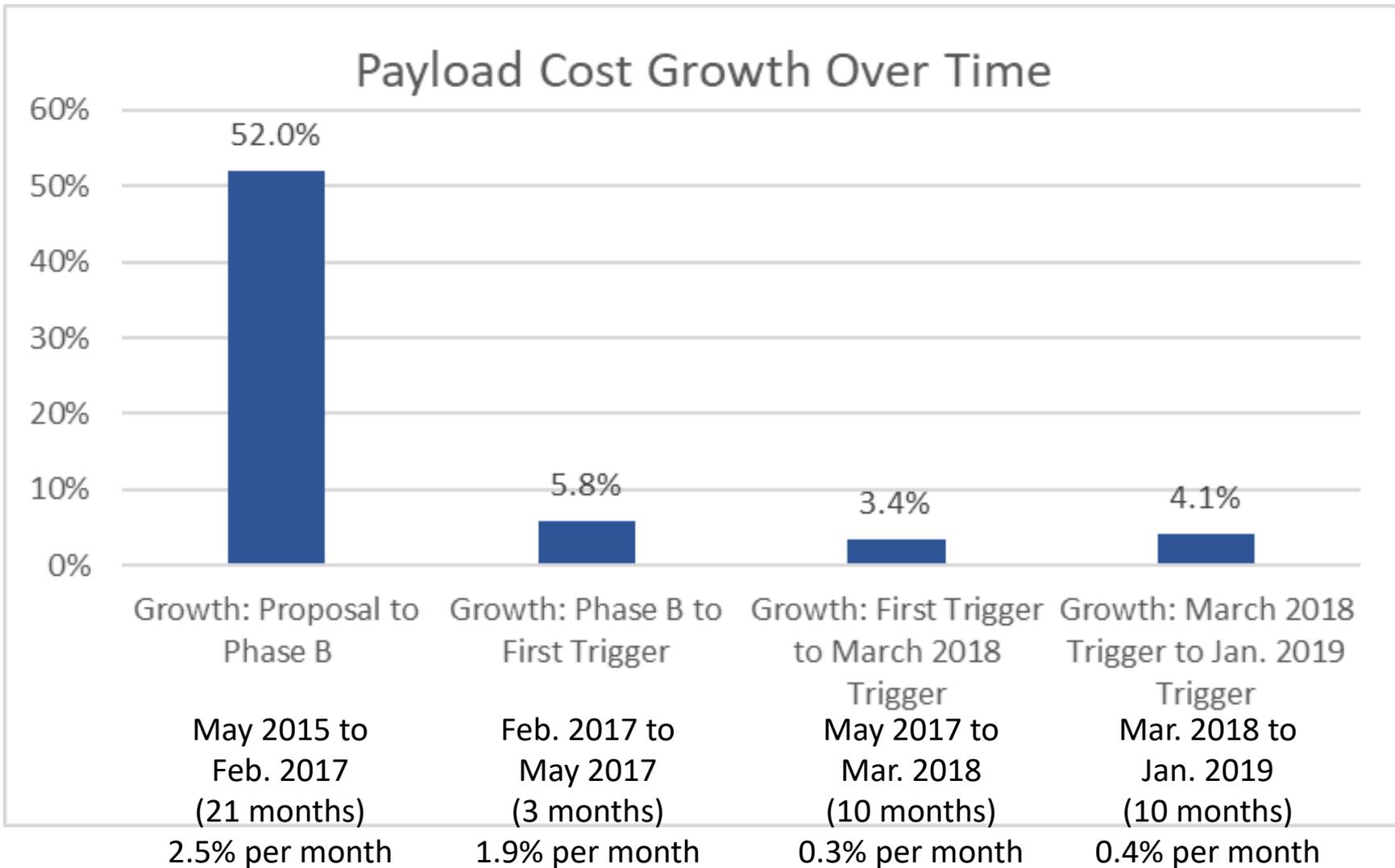
From March 8, 2018 Payload Resource Meeting



- The process, by necessity, has level of subjectivity
- However:
 - The process is transparent
 - *Monthly, the week after the numbers are generated, they are sent to each of you*
 - The process has an appeal path
 - *Even in the worst case, when no agreement is reached, the issue is resolved at the HQ level*



Payload Cost Growth Over Time

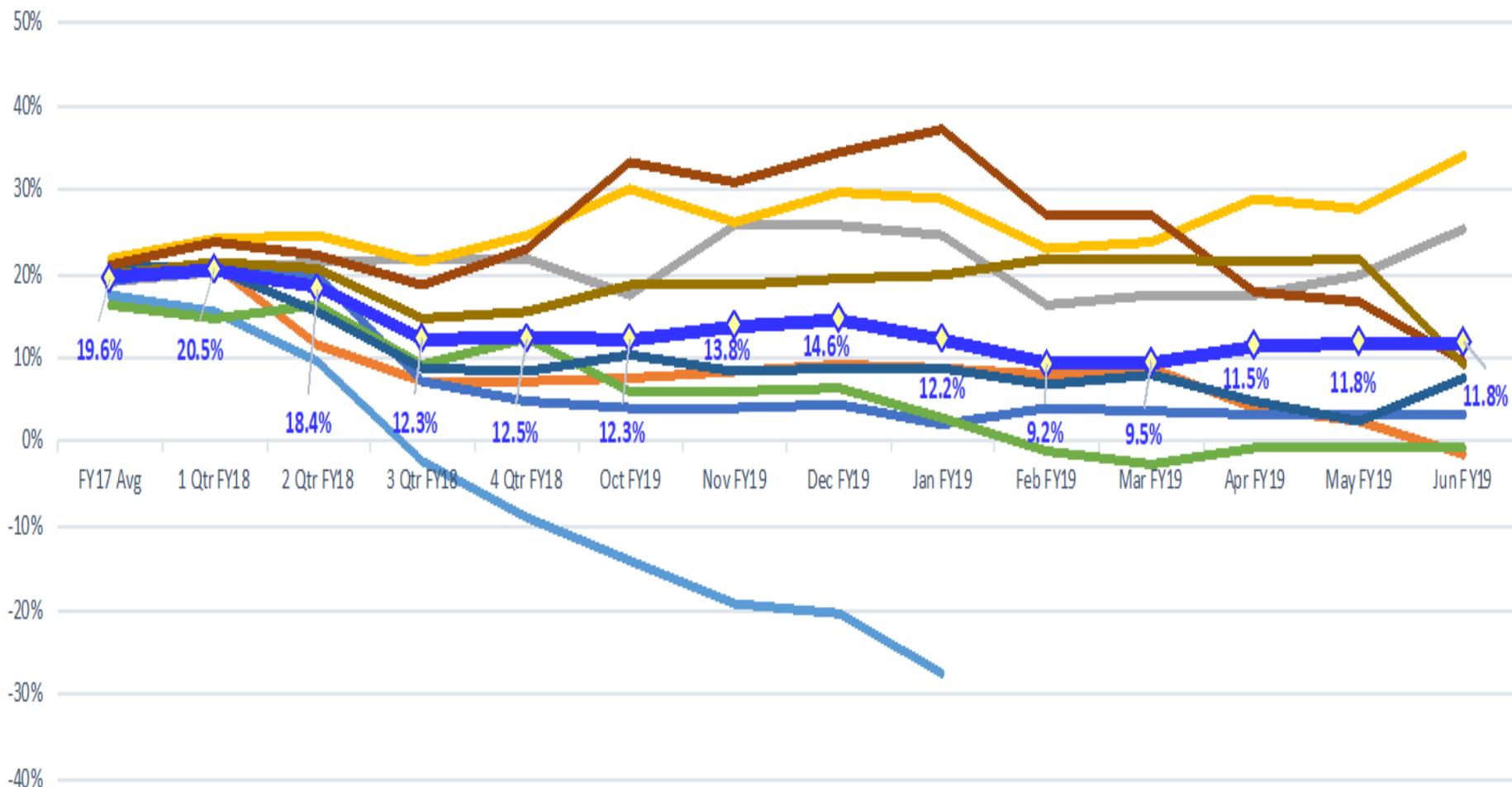




Current Instrument Trigger Chart



Instrument Trigger Point - Trend Chart





Questions?

