

NASA AGENCY PROGRAM MANAGEMENT COUNCIL

Meeting Minutes and Actions

VITAL MEETING DATA

Date: December 6, 2018, 10:00 a.m. – 5:30 p.m.

Location: NASA Headquarters 8Q40

Attendance: APMC members and invited participants. The Associate Administrator chaired.

MEETING ACTIVITIES

The APMC met to:

- Hear Dr. Michael Crow, President, Arizona State University (ASU), discuss Breaking Down Silos in an Organization
- Discuss an OCFO/SID study on Historical Mass Growth Analysis for NASA Science Missions
- Approve NASA's High Risk Corrective Action Plan for submission to GAO
- Hear an update astronaut health care, via the newly enacted TREAT Act
- Review the Space Network Ground Segment Sustainment (SGSS) annual performance checkpoint

FIRST ITEM OF BUSINESS: *Breaking Down Silos in an Organization (Informational)*

At the Administrator's request, Dr. Michael Crow, President of Arizona State University, discussed his experience breaking down organizational silos during a major transformation of ASU. Together with a group of dedicated change leaders, Crow initiated a long term effort to change the culture, design and structure of the school (in that order).

Prior to transformation, ASU was built around a traditional disciplinary siloed structure, struggled with low retention, and limited growth in basic research. Crow characterized traditional state universities as following an "organizational preservation" model, and most private universities as following an "enlightenment of the individual" model. He initiated a new "enterprise model" focused on social transformation and economic success, and organized from the top down around grand challenges first, and disciplines second. Crow noted that only two universities, ASU and Purdue, are fully following this model, although others are experimenting on smaller scales with implementing it.

In pursuing a transformation this complex, Crow stressed the approach to change management was critical: first argue about the "why", then argue about the "what", and finally about the "how". At the end of the day, at the "how" stage, somebody then has to make decisions and move on.

In ASU's transformation, the "why" first asked "who are we, what are we, and what is our role and responsibility in society". The "why" was embodied through ASU's refocused Charter, which incorporated significant elements of research and discovery for the purpose of generating public value, responsibility for the economic, social and cultural health of served communities, and emphasis on inclusion and success for the university's constituents ('a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed'). These served as clear and strong value statements which would later anchor design.

The "what" was then captured as a set of eight "Design Aspirations" consistent with the Charter's values. These included statements such as "ASU creates knowledge by transcending academic disciplines", "ASU

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connects with communities through mutually beneficial partnerships”, and “ASU catalyzes social change by being connected to social needs”.

The “how” included the specific restructuring and changes in education approach. ASU established 24 transdisciplinary schools focused on grand challenges ‘atop’ traditional departments, such as a School for Engineering of Matter, Transport and Energy, a School of Geographical Sciences and Urban Planning, and a School of Human Evolution and Social Change. It emphasized digital transformation in the education process, and expanded learning from traditional (fully immersed, on-site, technology enhanced) to broadening degrees of remote education (e.g., digitally immersed, online, technology enhanced).

As a result of transformation, since 2008 ASU has more than doubled its number of engineering students, increased its minority student population by a factor of 5, and improved freshman retention from 68% to 90%. Research expenditures have tripled, and over 200 technology partners are engaged to advance learning outcomes. With the same faculty and a 65% reduction in public investment, ASU is now generating 3x more graduates and 5x more research.

APMC members asked about overcoming initial resistance; Dr. Crow emphasized that it required total commitment on the part of change leaders, ‘be willing to die or be fired’. He also observed that most arguments tend to be about the “how”, but people may argue without even knowing the “why” of why they’re doing things. Beginning consensus with a clear and value-oriented “why” helps pull arguments back to fundamentals. Even so, at the end of the day, implementation decisions have to be made, and not everyone will be happy with the outcomes, and some may need to move on.

The CFO observed that disallowing the phrase “because that’s the way we’ve always done it” is perfect for NASA.

Editor’s note: Additional details on the ASU transformation can be found in the book, “Designing the New American University”.

SECOND ITEM OF BUSINESS: *Historical Mass Growth Analysis for NASA Science Missions (Informational)*

James Johnson, Office of Chief Financial Officer (OCFO) Strategic Investment Division (SID), presented results of an analysis of the degree and causes of mass growth in NASA science missions.

From a sample of 33 missions, the mission average [median] cost growth from CSR/SRR was 42% [24%], from PDR was 22% [9%], and from CDR was 8% [1%].

Mass growth for instrument payloads only was higher (52% [30%] from CSR/SRR, 31% [11%] from PDR, 16% [2%] from CDR). In general, instrument payloads have been more challenging than spacecraft buses, not only in terms of total growth, but also in that uncertainty on mass growth continued later in development life-cycles. These results are slightly to somewhat higher than organizational guidelines such as the GSFC Gold Guide, ANSI AIAA Guide, JPL Guide, and NASA GB Guide, and studies such as NCSS studies. Average mass growth has generally exceeded the 30% Rule of Thumb. Johnson recommended that guidelines used to derive allowances for contingency/reserve be adjusted to allow for the unique complexity of NASA missions.

Planetary mission spacecraft experienced high growth early (54% from CSR/SRR) and sustained through PDR (33%). Earth science mission instruments experienced very high growth (67% from CSR/SRR, nearly twice the growth of planetary mission instruments). Earth science instruments also see high growth (23%) late in the life-cycle.

APMC members' discussion included a suggestion to fix mass growth by making initial estimates higher; to build in a cushion. We should be accurate and honest and get initial estimate correct. Members speculated that the culture may be to estimate things low to get approval.

The Associate Administrator noted that our overall performance has actually improved on small/medium missions, though on the bigger missions, we're not there yet. He does not believe that malicious underestimation to secure approval is the norm, but probably an outlier, based on those results. Our job is to develop methodologies and tools to be able to do better estimates before a PDR/CDR level of maturity. As part of that we need to get better at understanding what drove the growth in order to get better at estimating.

The AA also agreed that NASA probably needs to change the guidelines going up to PDR, and can discuss that pretty quickly. He stressed that our goal and challenge is to balance planning programs with adequate reserves with the opportunity costs associated with that. At the end of the day we have to deliver the most value we can to the American people.

THIRD ITEM OF BUSINESS: *High Risk Corrective Action Plan Approval (Decisional)*

Based on the anticipated results of the 2019 GAO High Risk report, and recent high-visibility challenges with several major programs/projects, OCFO was actioned in August 2018 to determine the feasibility of implementing a Corrective Action Plan (CAP) update prior to the publication of the 2019 High Risk Report in February 2019. OCFO formed a working group and steering committee with participation from mission directorates, OCFO, procurement, OCIO, OCE, JSC and GSFC to recommend a new CAP for approval by the APMC.

The current CAP was established in 2007 and updated in early 2008, and addressed NASA policies and processes for program/project management and related surveillance of contractors. Its initiatives have been fully implemented, including:

- Creation of the monthly Baseline Performance Review (BPR)
- Updates to NPR 7120.5/7/8 to include Key Decision Points (KDPs), required independent reviews, entry and exit criteria, Standing Review Board (SRB) inputs, and required independent cost estimates
- Formalization of Acquisition Strategy Meetings (ASMs)
- Life Cycle Cost budgeting to the 70% confidence level
- Other enabling measures such as enhanced APPEL curricula, enhanced access to CADRe cost data, improved external performance reporting, IEMP Agency-wide business systems, and specific procurement process/policy improvements

The new CAP will be owned by the NASA AA, with OCFO/SID maintaining CAP documentation, tracking, reporting and subsequent updates. Lead Executives/Organizations in various initiatives will be responsible for execution and progress reports. Progress will be monitored annually in the summer of odd-numbered years, and the overall CAP will be updated if needed in the summer of even-numbered years (although the AA may change or revise the CAP at any time).

The proposed CAP will include 3 areas of emphasis, 7 specific initiatives to implement, 1 initiative to pilot, and 1 initiative to research. Areas of emphasis include:

- Improve NASA's Governance of Strategic Acquisitions
- Risk Assessment, Requirements and Concept Definitions Early in the Formulation Phase
- Contractually Incentivizing High Performance

Specific initiatives to implement include:

- Enhanced Earned Value Management Implementation
- Improved HEOMD Portfolio Insight and Status
- Implement Programmatic (PP&C) Training Curriculum
- Include Original Agency Baseline Commitments for Performance-Driven Rebaselined Projects
- Enhanced Annual Strategic Review Process
- Create Technology Readiness Assessment (TRA) Best Practices Document
- Update Probabilistic Programmatic Policy

Specific initiatives to pilot or research include:

- Create a Schedule Repository (pilot)
- Enhance Implementation Indicators for Trends and Projections (research)

During the briefing, members engaged in an in-depth discussion about applying Joint Confidence Level (JCL) estimates to KDPs earlier in the process. The Associate Administrator observed that NASA could to the analysis at KDP-B but it needs to be treated as a test case; we will need to try it and then review to see if it is producing anything of value. Tailoring and development would be needed to conduct a parametric JCL that could be applied early in the process, and a 7120.5 NID update would be needed. The AA will issue an implementation memorandum detailing the JCL methodology for KDP-B after key stakeholders consult on the details, and the JCLs for later phases remain as-is.

Decision:

- *The NASA Associate Administrator / APMC Chair approves the Corrective Action Plan [with initiatives to implement and areas of emphasis as itemized above].*

Informal actions (to be closed out of board):

- OCFO/SID to work with OCE and SMD regarding wording concerns for the implementation plan memo for the High Risk CAP. Due: 14 January 2019.
- OCFO/SID to brief the APMC Chair on the JCL estimating approach for KDP-B, and pick a flagship program to implement and evaluate such an approach. Due: 7 January 2019.

Formal actions (to be closed in board):

- OCFO, in consultation with OCE and SMD, to prepare the new JCL requirements implementation guidance to be initially documented in a memo from the AA. This guidance will be re-evaluated no less than annually at CAP update briefings to the APMC. Due: 14 January 2019.
- OCE, in coordination with OCFO and the appropriate NPD/NPR OPRDs, will update NPR 7120.5 to codify the confidence level policy guidance memo as a NID. Due: 1 May 2019.

FOURTH ITEM OF BUSINESS: *TREAT Act Implementation (Informational)*

The NASA Transition Authorization Act of 2017 implemented new provisions including the “TREAT Astronauts Act” (“To Research, Evaluate, Assess and Treat Astronauts Act”). TREAT authorizes NASA to monitor, diagnose and treat medical and psychological conditions associated with spaceflight, and was

a priority legislative proposal advanced by the Agency. James D. Polk, Chief Health and Medical Officer, provided an overview of implementation and of responses to congressional actions on cost impacts assigned to NASA alongside passage of the new Act.

Currently, the programs as outlined, are running within budgetary guidelines. Starting in FY19, implementation of the expanded health monitoring for former astronauts and TREAT Astronauts Act administration at the Johnson Space Center will increase local procurements by approximately \$400,000 annually. There are currently three active astronaut Department of Labor (DoL) cases going through the DoL process but no former astronaut (TREAT Astronauts Act cases) pending. Coverage, treatment, and costs have yet to be determined in these cases. Therefore, figures for the cost of treatment not covered by DoL and in which NASA would in turn be the secondary payer, are not yet available.

The current legislation allows us to cover the astronauts for surveillance and treatment.

The data received will be important not only to NASA, but also to inform exploration risks and requirements, and to inform the commercial space sector.

As the astronaut corps grows, as exposures grow, and as the cost of healthcare grows, we may need to transition from a DoL based program to a secondary insurance program in order to gain the most data, provide the best coverage, and the best cost to the agency and patient.

FIFTH ITEM OF BUSINESS: *Space Network Ground Segment Sustainment (SGSS) Annual Report (Informational)*

William Marinelli from the Space Communication and Navigation (SCaN) Division, presented the SGSS Annual Report. NASA set up an independent review of cost/schedule to Space Network (SN) Ground Segment Sustainment (SGSS) completion, including an analysis showing how much money it would cost to finish the upgrade or cancel the contract. NASA completed this review and developed a plan in 2016 and is now reporting progress annually.

The IRT review is complete, and recommends continuing the SGSS project to FAR. The primary objectives were completed in the Plan's Phase 2 for FY18. Phase 2 included:

- Authorization to Operate (ATO)
- System Integration Review (SIR)
- Factory System Acceptance Test (SAT)
- Solid EVMS Performance throughout FY18
- Financial Performance within FY18 Budget Allocation

Adjustments in the FY19 Plan are being made for Lessons Learned. The FY19 Priorities and objectives have been defined and aligned with the Phase 2 Plan. The plan includes a focus shift from the factory to the field and includes SGSS training and knowledge transfer for SN WSC operations that are in process. The successful ORR-1 is critical key for mitigation of SGSS NRE risk. The SGSS Phase 2 Plan technical and schedule fundamentals remain unchanged. The effort is tracking to planning dates with reserve for risk adjusted dates.

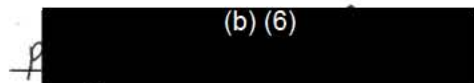
The contractors for SCAN are General Dynamics and Harris. GD is largest contractor on the program and has made the decision that they would descope subcontracting by end of FY19 and pull work in-

house, doing it themselves. GD has better chance to control the cost and schedule problems; even with some overrunning there will be less than if no change is made.

The key milestones remaining for the program will be the First Operations Readiness Review in FY19, and the Final Acceptance Review (FAR) anticipated for June 30, 2021. Further APMC annual reviews are not anticipated; performance will be monitored quarterly through the BPR.

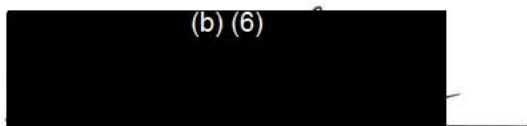
The meeting adjourned at 5:00 p.m.

Minutes Prepared by:

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Mark R. Hershey, APMC Executive

Minutes approved by:

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Steve Jurczyk, Associate Administrator / APMC Chair