

National Aeronautics and
Space Administration

Headquarters

Washington, DC 20546-0001



August 6, 2012

Reply to Attn of: EA

TO: Associate Administrator (Acting)

FROM: Deputy Associate Administrator for Aeronautics

SUBJECT: Gravity and Extreme Magnetism Small Explorer (GEMS) Independent Assessment

Please find enclosed the final report of the Independent Assessment of the Science Mission Directorate's Non-Confirmation of the Gravity and Extreme Magnetism Small Explorer (GEMS) project. On May 10, 2012, the Science Mission Directorate held a Program Management Council (DPMC) at which they conducted the Confirmation Review for the GEMS project. The decision of the DPMC was to non-confirm GEMS for continuation into the detailed design phase, thus effectively terminating the project. The rationale for this decision was documented in the signed decision memorandum from the May 10th DPMC. In a letter sent to NASA Administrator Bolden dated June 19, 2012, Senator Barbara Mikulski requested that the Agency conduct an independent assessment of this non-confirmation decision.

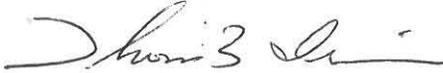
The scope of the assessment included a review of the process and procedures leading to the non-confirmation decision, an examination of the costs to continue the project vs. termination costs, and assessment of the impact of cancellation on the cost of launch services for future NASA missions. After an in-depth review of relevant materials and interviews with parties involved with the decision, the Assessment Panel determined that the decision was compliant with formal Agency and Mission Directorate policies, requirements and guidance. While the review revealed some anomalies in the process, the Panel did not consider these to be material to the non-confirmation decision. The Assessment Panel's key finding was that the process upon which the non-confirmation decision was made was appropriate.

This submittal of the Assessment Panel's final report includes a copy of the letter from Senator Mikulski in which she requests that the Agency perform the independent assessment, Administrator Bolden's reply letter to Senator Mikulski's request, the Panel's approved charter, and the final report, which is in presentation format.

It was an honor for the members of the Panel to be asked to provide this service to the Agency. In taking on this responsibility, we were assisted by NASA civil servant and contractor staff representing the Office of the Chief Engineer, the Science Mission Directorate, the SMEX Program and GEMS Project Offices, the Goddard Space Flight Center, and Orbital Sciences Corporation. To a person, everyone with whom we interacted was a consummate professional. It was truly humbling to have encountered so many dedicated and capable individuals; the experience gives one great hope for the future of the Agency.

Along with all of the Panel members, I stand ready to answer any questions or concerns that you may have about this report, or to provide any additional information that you may require.

Respectfully,



Thomas B. Irvine
Deputy Associate Administrator
Aeronautics Research Mission Directorate

Cc w/ Enclosures:

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Chris Scolese
Rick Obenschain

GEMS

Final Independent Assessment





Gravity and Extreme Magnetism Small Explorer Non-Confirmation Analysis

Tom Irvine, Assessment Chair

July 24, 2012

Summary Findings and Recommendation



- The Assessment Panel was asked to review the process and procedures leading to the non-confirmation decision
- We were also asked to look into non-confirm related effects 1) for continuation vs. termination costs, and 2) on launch services for future NASA missions
- Summary assessment: the process followed by SMD/Decision Authority was sound, although discrepancies were found
 - One discrepancy involved the SMD Handbook guidance for reconciliation of cost estimates prior to KDP-C; there was confusion involving cost caps, schedule delays, and misunderstandings regarding formal and informal decisions/direction
 - Other discrepancies were not material to the non-confirm decision and should be taken as lessons-learned
- Recommendation: the Panel has determined that the process upon which the non-confirmation decision was made was appropriate



Outline

- Assessment Team Charter Purpose/Scope
- Assessment Panel and Supporting Organizations
- Approach
- Background on Policy and Process
- Timeline Describing Contributing Factors
- Summary of Changes to the Plan
- Assessment of the Non-Confirmation Decision
- Additional Observations
- Closeout Cost Comparison
- Launch Services Impact
- Summary

Assessment Team Charter Purpose/Scope



- Assess the GEMS non-confirmation decision by addressing¹:
 - The justification and process for non-confirming
 - The cost to finish GEMS vs. cost to terminate and store any residual hardware or prototypes
 - The impact of cancellation on future NASA launch costs
 - Determine the validity of the process used to make the GEMS non-confirmation decision in terms of consistency with applicable guiding/controlling documents
 - Recommendation as to whether or not the process upon which the non-confirmation decision was made was appropriate
- (1) Letter from Senator Barbara Mikulski to Administrator Bolden dated June 19, 2012, in response to notification of the GEMS non-confirmation prior to NASA submission of the FY 2012 Operating Plan Change to the Congress on June 20, in which the non-confirmation was defined

Assessment Team Charter Purpose/Scope (continued)



- What's the big picture? (that we did not lose sight of amid process detail)
 - Science objectives are compelling; project aligns with Astrophysics decadal priorities
 - Programmatic objectives beyond successful project execution—such as astrophysics flight rate (especially for small sat launch) and portfolio balance—are also considerations
- What we are chartered to do:
 - Review the process leading to the KDP-C decision
 - Review and assess existing data for consistency and compliance to applicable government requirements for non-confirming the project
 - Address the question: “were the data that would have been required to make the non-confirmation decision available to the decision makers at the time of the DPMC KDP-C”
- What we are not chartered to do:
 - Reproduce the technical/cost/schedule/risk analysis already performed by SMD, the Astrophysics Division, SMEX Program, GEMS Project, or GEMS Independent Assessment Panels, including the SRB and the Aerospace Corporation
- Assessment Timeline
 - First panel meeting July 10th
 - Brief NASA AA July 24th

Assessment Panel and Supporting Organizations



- Panel Members

- Chair: Tom Irvine
- OoE: Helen Grant
- OCE: Sandra Smalley
- HEOMD: Nancy Hammell
- LaRC: Frank Peri
- OSMA: DeeDee Healey
- OCS: Gale Allen

- Supporting Organizations

- IPAO/CAD: Ron Larson/James Johnson
- Launch Services Program: Jim Norman, Anne Sweet, Amanda Mitskevich
- Administrative Support: Precittia Taylor, Alicia Wesley, Maria Werries

Approach: How Did the Panel do Its Job?

Data Gathering



- Relevant documentation covering the timeframe from Announcement of Opportunity (AO), Concept Study Report (CSR), through early 2011 Replan, January 2012 Continuation Review, PDR, Goddard Center Management Council (CMC), and KDP-C
- The following organizations provided written documentation:
 - SMD Astrophysics Division (Division Chief and Program Executive)
 - Standing Review Board and Integrated Independent Review Team
 - GEMS Project
 - Office of Legislative and Intergovernmental Affairs
 - Orbital Sciences Corporation
- Much of our emphasis was from 2011 Replan forward to KDP-C

Approach: How did the Panel do Its Job?

Clarifying Discussions



- Purpose: Discuss and clarify any confusion, questions or concerns Panel had with submitted documentation
- Asked many of same questions of multiple organizations to assess consistency in understanding of process and procedural policy, requirements, guidance, and communications
- Assessment Panel held question and answer sessions with:
 - Standing Review Board - Linda Pacini (for Mike Gazarik)
 - Orbital Sciences Corporation - Mike Miller, Joe Bushman, Kate Kronmiller (Assessment Panel supported by OGC and HQ OP during this meeting)
 - SMEX Program - Nick Chrissotimos, Christine Hinkle, Mike Delmont, Herb Middleman
 - SMD/Astrophysics - Chuck Gay, Paul Hertz, Geoff Yoder, Lia LaPiana
 - GEMS Project Office - Greg Frazier, Jean Swank, Jean Grady, Matt Ritsko, Keith Jahoda, Tom Johnson
- Panel Chair met individually with:
 - SMD - John Grunsfeld, Chuck Gay
 - Agency Chief Engineer - Mike Ryschkewitsch
 - SMD Chief Engineer - Ken Ledbetter
 - GSFC Director - Chris Scolese (telephone conversation)



Background on Policy and Process



Environment

- Federal government departments and agencies are operating in a time of heightened fiscal responsibility and accountability
- Accordingly, NASA has updated policy and guidance to focus on:
 - Formulation and Implementation with robust cost estimating, including independent cost estimates
 - Well defined baselines, designs, and risk postures at key decision points
 - Formal requirements and guidance with emphasis on formal (decision) documentation
- NASA has enhanced process and implementation
 - Ensuring independent assessment continues and that criteria are understood
 - Enhancing periodic performance review process
 - Providing support to projects when cost, schedule and/or technical performance in question
- NASA shifting its operational paradigm to balance technical accomplishments with establishment/execution of adequate cost, schedule and technical baselines along with addressing poor performance to avoid collateral impact to other missions

GEMS is a Category 3 project (less than \$250M) in Phase B, and was requesting transition from Formulation to Implementation (Phase C) where the official Agency baseline is established and external commitments are made



Policy and Process Applicable to GEMS

- NPR 7120.5, NASA Spaceflight Program and Project Management requirements establishes spaceflight project lifecycle, governance and decision making process, and requirements
 - Governing Body is the SMD Directorate Program Management Council (DPMC)
 - Decision Authority (DA) is the SMD Associate Administrator
 - The DA is decision maker at Key Decision Points and Termination/Cancellation Reviews
 - The NASA Associate Administrator adjudicates dissenting opinions
 - Termination/Continuation reviews may be requested for circumstances such as:
 - Anticipated inability of the program or project to meet its commitments
 - Unanticipated change in Agency strategic planning
 - Unanticipated change in the NASA budget
 - A requirement relevant to our process discrepancy finding: “Required ICAs/ICEs will be reconciled internally within the SRB and with the program/project prior to the PMC review” (NPR 7120.5D Paragraph 2.5.2.2); the ICE requirement was subsequently eliminated in NID 7120-97 which was applicable at KDP-C.

GEMS was under 7120.5D at award, but also determined it is compliant with the most current revision, NASA Interim Directive (NID) 7120-97, against which the Project was assessed at KDP-C

Policy and Process Applicable to GEMS



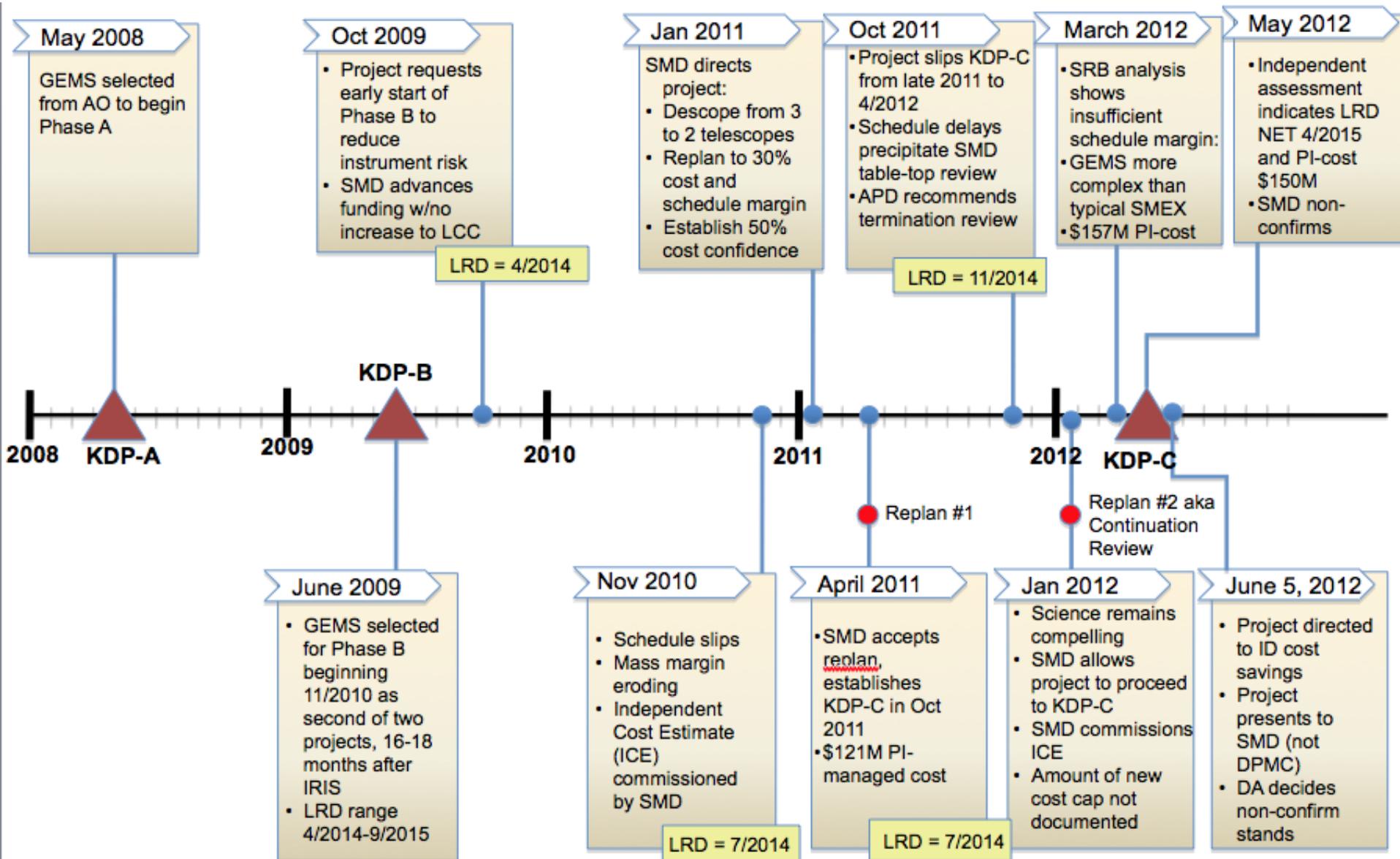
SMD Policy and Guidance

- GEMS competitively selected as part of an SMD Explorer Program Small Explorers and Missions of Opportunity (SMEX) AO, which:
 - Establishes cost cap
 - Establishes cancellation criteria including if at any time, cost, schedule, or scientific performance commitments appear to be in peril
- SMD Policy Document (SPD) 19 - Meeting the Cost and Schedule Cap for PI Led Missions
 - At KDP-B, PI commits to mission cost commitment at or below the AO-specified cost cap
 - Project budget and schedule are baselined at KDP-C; a joint cost and schedule estimate is developed by the project and assessed by the SRB prior to KDP-C (additional independent cost and schedule estimates may be conducted)
 - At KDP-C, the Management Baseline is the PI-managed cost as proposed in the proposal or CSR, as adjusted by SMD at, as minimum, the 50% confidence level established by the joint cost and schedule estimates (50% JCL)
 - One of the decisions associated with KDP-C approval is identification of sufficient cost reserves that can supplement the Management Baseline budget and satisfy the Agency JCL requirements; SMD generally sets the Commitment Baseline budget at or near the 70% joint confidence level
 - The Agency considers provision of additional funds to the project beyond the Commitment Baseline (established at KDP-C) to constitute a breach of the Agency's cost commitment
- SMD Handbook (provides guidance and describes SMD practice)
 - A “no confirmation” decision by the SMD AA at the confirmation review can direct the project back for further Formulation or it can terminate any further effort; changes in budget or strategic plan criteria used to assess the project, or changes within the program or project that violate the original approval criteria, could necessitate reformulation and reevaluation for re-baselining or cancellation
 - Special-purpose independent reviews (e.g. Cancellation Review) are conducted when directed by the Agency or Directorate PMC; elements such as the anticipated inability of a project to meet its commitments, an unanticipated change in Agency strategic planning, or an unanticipated change in the NASA budget may initiate such reviews
 - In preparation for KDP-C, ensure completion of detailed project cost estimate and independent cost estimate, and that estimates are reconciled to achieve a thorough understanding of expected costs, cost assumptions and risks



Timeline Describing Contributing Factors

GEMS Timeline



Summary of Changes to the Plan



	Date	PI-managed Cost	Expected KDP-C	Expected LRD	Conditions
Initial Selection	June 2009	\$119M	Sept 2011	April 2014	Project asked for early start of polarimeter
Replan #1	April 2011	\$121M	Oct 2011	July 2014	SMD directed \$12M in descopes and \$2M in approved new/restored scope (E/PO, PS, student)
Replan #2 (Continuation Review)	Jan 2012	\$135M	May 2012	Nov 2014	
KDP-C	May 2012	>= \$150M	May 2012	April 2015	SMD assessment at 50% Cost confidence



Assessment of the Non-Confirmation Decision

Assessment of the Non-Confirmation Decision



- Policies and procedures followed:
 - Project conducted reviews and completed required products
 - Independent Estimates and Joint Confidence Level analyses were conducted
 - Decision process included Project presentation of their baseline, recommendations from the Program, Center, and SMD Astrophysics Division
 - Decision was made by the Decision Authority after considering all information
 - If some instances, policies and procedures were not followed explicitly, however, their intent was met (e.g. termination criteria called out in memo from Astrophysics Division rather than in the PLRA per the SMD Handbook; PLRA was to be baselined at KDP-C)
- Policies and procedures not followed:
 - Three weeks post PDR, project delivered updated integrated master schedule to SRB for inclusion in the ICE, leaving only one week to review project data and hold schedule
 - Though discussion of estimate variances took place, reconciliation of the ICE was not performed prior to CM; however, no formal objections were raised with decision to proceed with KDP-C
 - All positions were made known to Astrophysics Division

Assessment of the Non-Confirmation Decision (continued)



- What occurs at KDP-C
 - At its heart, the KDP-C or Confirmation Review is the Decision Authority making a judgment as to whether there is a reasonable case that the project can be completed for the budget NASA has available and in the schedule allotted
 - Decision Authority assesses **the risk** of cost overrun and schedule slip using data presented by the Project, Program, Center, HQ staff, and independent review bodies, as well as information gleaned on project performance from normal HQ oversight in phases leading up to KDP-C
 - For GEMS project, Decision Authority is SMD AA with advice from SMD DPMC members
- A word (or two) on cost caps
 - Much debate regarding the value of the cost cap leading into KDP-C
 - Project believes that the cost cap was raised from \$121M to \$135M, based on communication from SMD in the weeks after the January 2012 Continuation Review, the Draft PLRA, and budget data in N2
 - SMD believes that the \$135M was a value for the Project to use in planning as they prepared for KDP-C
 - In the context of the KDP-C, whether the cost cap was \$121M or \$135M is less important than the risk that the project budget and schedule will grow beyond what NASA is willing to fund

Assessment of the Non-Confirmation Decision (continued)



- What transpired leading up to, and at, KDP-C (Confirmation Review)
 - SMD conducted a Continuation Review 3 months prior to KDP-C at which it was determined that the science is still compelling, that the amount of additional funds required for reserves didn't warrant cancellation and that the amount of additional funds needed to restore healthy cost reserves was not substantially large enough to warrant termination prior to Confirmation Review
 - Project believes they made a case at Confirmation Review that they could achieve the 11/2014 launch date with a budget of \$135M at 50% Confidence Level and \$156M at 70% Confidence Level
 - Independent cost and schedule estimates from Aerospace and SRB indicate a 50% Confidence Level budget in the range of \$150 to \$157M and a 70% Confidence Level of approximately \$167 to \$169M
 - Cost estimate prepared by GSFC RAO office was \$129M at 50% Confidence Level and \$165M at 70% Confidence Level
 - Goddard CMC, held prior to KDP-C, agreed with decision not to reconcile project JCL and the ICEs, based on their understanding that the 50% CL cost presented at KDP-C would be compared against an approved \$135M cost cap, and that other factors (existence of 4 estimates, credits for other support/risk reduction) would be taken into account
 - **This concurrence was inconsistent with the Continuation Review Decision Memo—a key misunderstanding**

Continuation Review Decision Memo states: "additional [cost] increases identified at Confirmation Review will be considered cumulative when considering whether to confirm"

Assessment of the Non-Confirmation Decision (continued)



- What was decided (and officially documented)
 - Decision Authority determined that cost estimates developed by Aerospace and SRB most appropriately reflected the potential future cost and schedule picture
 - This was determined based not only on information presented in the DPMC, but also on past project performance
 - GEMS science had already been descoped during replan conducted during Phase B; there were no practical descope options available to offset future cost and schedule growth



Additional Observations

Additional Observations



- Non-Confirmation Decision Documentation
 - The Decision Agreement coming out of the May 10, 2012 DPMC KDP-C Review presented a rationale for non-confirmation that, as noted by SMD in retrospect, could have been more clearly worded
 - Inconsistent with previous DPMC decision documentation, the Explorers Program Manager and GSFC Director were not given the opportunity to sign the KDP-C Review Decision Agreement
 - While SMD noted their reasoning was to reflect their ownership of the decision, the panel felt that all parties would have been better served by including the Program and Center in the decision documentation process
- Program Level Requirements Agreement (PLRA)
 - In late 2011, the project began circulating a draft PLRA—including reference to the \$135 million cost cap—through the appropriate signature cycle in preparation for KDP-C
 - By mid-April, 2012 all signatures had been acquired except that of the SMD Associate Administrator, who signs when the project is confirmed at KDP-C
 - While the document was still in draft form pending confirmation, it was not marked as such, and was widely distributed and subsequently assumed as the new project baseline, when in fact it was not



Closeout Cost Comparison

Closeout Cost Comparison



- Potential Termination Liability is the maximum cost that will be incurred if the government terminates. The Federal Acquisition Regulation (FAR) also refers to such costs as “termination costs.” Allowable contract termination costs are specified in the FAR and include:
 - Employee severance pay
 - Rental costs for unexpired leases and penalties for early termination of leases
 - Subcontractor claims
- **The total costs associated with terminating GEMS will be calculated at the time of termination**
 - NASA will propose a final operating plan adjustment reflecting these costs
- Preliminary termination costs provided by the GEMS project are:
 - \$13.0M estimated (June 5 KDP-C Follow-up package)
 - Minimal storage fees
- Estimated low to high range of costs to complete GEMS
 - \$135M (current project estimate) less \$43.5M (costs incurred through May 2012) = **\$91.5M (cost to complete) + launch vehicle costs***
 - \$169M (independent cost estimate at 70% CL) less \$43.5M (costs incurred through May 2012) = **\$125.5M + launch vehicle costs***

* Launch Vehicle costs estimated at not-to-exceed \$55M



Launch Services Impact

Launch Services Impact



Tasking:

- Assess potential impacts of cancelling GEMS on future launch vehicle costs for projected NASA missions
- Use the 2012 AMPM as guide for projected future NASA missions that would use a launch vehicle of the capability necessary to launch GEMS
- Provide any additional launch vehicle projected needs not covered in the 2012 AMPM that are relevant to non-confirmation of GEMS
- Provide any documented launch vehicle provider on and off ramp projections that could be impacted by non-confirmation of GEMS

Launch Services Impact



- Current NASA missions on contract or planning to require launch vehicle of the same capability necessary to launch GEMS:
 - IRIS launching in 2013
 - EV-2 launching in 2016/17
- Potential future NASA missions that might* use a launch vehicle of the capability necessary to launch GEMS:
 - Helio EX-1 in 2018
 - Helio SMEX in 2021
 - Astro SMEX in 2021
- There are no documented launch vehicle provider on/off ramp projections that could be impacted by a non-confirmation of GEMS
- However, a launch vehicle provider's viability in an already fragile small payload/small launch vehicle market could cause a rapid change to their business case
- Cancellation of a certified launch vehicle product line could drive additional costs or risk, by either using a launch vehicle with more performance than required, or one not yet certified
- Another concern with cancellation of a launch vehicle product line would be potential workforce dilution and the impact to launch services in process, such as IRIS

* projects not far enough along in solicitation of mission concepts to understand their launch service requirements



Assessment Summary

Summary: What We Did



- We conducted a review (July 10th-July 24th) of the process leading to the KDP-C non-confirmation decision
- We reviewed and assessed existing data for consistency and compliance to applicable government requirements for non-confirming the project
- We addressed the question: “were the data that would have been required to make the non-confirmation decision available to the decision makers at the time of the DPMC KDP-C”
- We reviewed and documented the Project-generated cost to finish GEMS vs. cost to terminate and store any residual hardware or prototypes (this is an incomplete answer based on June 2012 data)
- The Launch Services Program assessed and defined the impact of cancellation on future NASA launch costs



Summary: Findings

Our Assessment of the Justification and Process for Non-Confirming

- The process followed by SMD/Decision Authority was sound, although there were discrepancies
- The data required to make an informed decision by the Decision Authority was available at KDP-C
- Independent cost estimates were not reconciled with the project cost estimate as required by 7120.5D
- Our assessment is that this discrepancy does not invalidate the non-confirm decision, because the Continuation Review decision memo clearly states that additional project cost increases from the \$121M Cost Cap would be considered cumulative when considering whether to confirm
- It was within Agency and mission directorate established processes that the Decision Authority made his decision, using projected cost and schedule growth based on projected risks from past project performance and other project historical data
- Other discrepancies were not material to the non-confirm decision and should be taken as lessons-learned

Our assessment is that the process upon which the non-confirmation decision was made was appropriate



Appendix A: Policy and Process Details

7120.5D (Valid at Selection)



Termination:

- Section 2.4.5.C - **Disapproval for continuation to the next KDP**. In such cases, follow-up actions may include a request for more information and/or a delta independent review; a request for a Termination Review for the program or the project (Phases B, C, D, and E only); direction to continue in the current phase; or re-direction of the program/project.
- 2.5.5 **If the Decision Authority is considering the termination of a program or a project in Phases B, C, D, or E, then a special termination KDP may be initiated**. Circumstances such as the anticipated inability of the program or project to meet its commitments, an unanticipated change in Agency strategic planning, or an unanticipated change in the NASA budget may be instrumental in triggering a termination KDP. For Category 2 and 3 projects, the Decision Authority notifies the NASA Associate Administrator at least 45 days (Category 2 projects) or 21 days (Category 3 projects) in advance of a termination KDP; for programs and Category 1 projects, the MDAA provides recommendations to the Decision Authority on the need for a termination KDP. The Decision Authority commissions an independent assessment, and following its completion, the governing PMC holds a Termination Review. For operating missions, terminations are handled in accordance with NPD 8010.3, *Notification of Intent to Decommission or Terminate Operating Space Missions and Terminate Missions*.
- 2.5.6 **At the Termination Review, the program and the project teams present status**, including any material requested by the Decision Authority. A Center assessment is presented as the Technical Authority (see Section 3.4) at the program or project level, or an OCE assessment is presented as the Technical Authority for tightly coupled programs with multiple Centers implementing the projects. Appropriate support organizations are represented (e.g., procurement, external affairs, legislative affairs, and public affairs), as needed. The decision and basis of decision are fully documented and reviewed with the NASA Associate Administrator prior to final implementation.
- **Definition: Termination Review**. A review initiated by the Decision Authority for the purpose of securing a recommendation as to whether to continue or terminate a program or project. Failing to stay within the parameters or levels specified in controlling documents will result in consideration of a termination review.

7120.5D (Valid at Selection)



Program Plan Template:

- c. Program Requirements on Projects. -For each project, provide a top-level description, including the mission's science or exploration objectives. Document the project's category, governing PMC, and risk classification. Describe the project's mission, performance, and safety requirements. For science missions, include both baseline science requirements and threshold science requirements. (See Appendix A for definitions.) Identify the mission success criteria for each project based on the baseline science requirements. State each requirement in objective, quantifiable, and verifiable terms. Identify the project's principal schedule milestones, including PDR, CDR, launch, mission operational-critical milestones, and the planned decommissioning date. State the development and/or total life-cycle cost constraints on the project. Set forth any budget constraints by fiscal year. **State the specific conditions under which a project Termination Review** would be triggered. Describe any additional requirements on the project (e.g., international partners). If the mission characteristics indicate a greater emphasis is necessary on maintaining either technical, cost, or schedule, then identify which is most important (e.g., state if the mission is cost capped, or if schedule is paramount as for a planetary mission, or if it is critical to accomplish all of the technical objectives as for a technology demonstration mission).
- 3.1.b of the Program Plan Template – Control Plans - Describe the program's performance measures in objective, quantifiable, and measurable terms and document how the measures are traced from the program high-level requirements. Establish goal and threshold values for the performance metrics to be achieved at each KDP, as appropriate; **In addition, document the minimum mission success criteria associated with the high-level program requirements that, if not met, trigger consideration of a Termination Review.**
 - 3.7 Review Plans: Explain the reporting requirements for program reviews. **Provide the technical, scientific, schedule, cost, and other criteria that will be utilized in the consideration of a Termination Review.**
 - Project Plan Template Section 3.1 - b. Describe the project's performance measures in objective, quantifiable, and measurable terms and document how the measures are traced from the program requirements on the project. **In addition, document the minimum mission success criteria associated with the program requirements on the project that, if not met, trigger consideration of a Termination Review.**

Project Plan Template: Section 3.8 Review Plan -**Explain the reporting requirements for project reviews. Provide the technical, scientific, schedule, cost, and other criteria that will be utilized in the consideration of a Termination Review.**

7120.5D (Valid at Selection)



Independent Reviews:

- 2.5.2 At the completion of the internal technical and programmatic reviews described in paragraph 2.5.1, **an independent life-cycle review is conducted by a Standing Review Board (SRB).**¹¹ The independent life-cycle review is conducted under documented Agency and Center review processes. Programs and projects are required to document in their Program and Project Plans their approach to conducting program/project internal reviews and how they will support the independent life-cycle reviews. Consistent with these processes and plans, the Terms of Reference (ToR) for each independent life-cycle review are jointly developed and approved/concurred by the respective individuals in Table 2-3.
- 2.5.2.1 The independent life-cycle review is convened by the same individuals (see Table 2-3) who develop the ToR to objectively assess the program/project's progress against the Program/Project Plan; its readiness to proceed to the next phase; compliance with NPR 7120.5 requirements; and for projects, the adequacy and credibility of the Integrated Baseline (at PDR and later). For the program and project reviews leading to program and project approval- P/SRR (PPAR) and P/SDR (PAR) for programs, and SRR/SDR/MDR (PNAR) and PDR (NAR) for Projects - a more integrated technical and programmatic review and evaluation is conducted, using the following criteria:
 - a. Alignment with and c Adequacy of technical approach, as defined by NPR 7123.1 entrance and success criteria.
 - c. Adequacy of schedule.
 - d. **Adequacy of estimated costs (total and by fiscal year), including Independent Cost Analyses (ICAs) and Independent Cost Estimates (ICEs), against approved budget resources.**
 - e. Adequacy/availability of resources other than budget.
 - f. Adequacy of risk management approach and risk identification/mitigation.
 - g. Adequacy of management approach contributing to Agency needs, goals, and objectives, and the adequacy of requirements flow-down
- 2.5.2.2 The SRB's role¹³ is advisory to the program/project and the convening authorities and does not have authority over any program/project content. Its review provides expert assessment of the technical and programmatic approach, risk posture, and progress against the program/project baseline. When appropriate, it may offer recommendations to improve performance and/or reduce risk. Its outputs are briefed to the program/project under review prior to being reported to the next higher level of management. **Required ICAs/ICEs will be reconciled internally within the SRB and with the program/project prior to the PMCreview.**

7120.5D (Valid at Selection)



Independent Reviews:

- 2.5.2.1 The independent life-cycle review is convened by the same individuals (see Table 2-3) who develop the ToR to objectively assess the program/project's progress against the Program/Project Plan; its readiness to proceed to the next phase; compliance with NPR 7120.5 requirements; and for projects, the adequacy and credibility of the Integrated Baseline (at PDR and later). For the program and project reviews leading to program and project approval- P/SRR (PPAR) and P/SDR (PAR) for programs, and SRR/SDR/MDR (PNAR) and PDR (NAR) for Projects - a more integrated technical and programmatic review and evaluation is conducted, using the following criteria:
 - a. Alignment with and contributing to Agency needs, goals, and objectives, and the adequacy of requirements flow-down NPR 7120.5D -- Chapter2 Verify Current version before use at: <http://nodis3.gsfc.nasa.gov/> Page 18 of 97NPR 7120.5D -- Chapter2 Verify Current version before use at:<http://nodis3.gsfc.nasa.gov/Page 18 of 97>from those.
 - b. Adequacy of technical approach, as defined by NPR 7123.1 entrance and success criteria.
 - c. Adequacy of schedule.
 - d. Adequacy of estimated costs (total and by fiscal year), including Independent Cost Analyses (ICAs) and Independent Cost Estimates (ICEs), against approved budget resources.
 - e. Adequacy/availability of resources other than budget.
 - f. Adequacy of risk management approach and risk identification/mitigation.
 - g. Adequacy of management approach.



7120.5D (Valid at Selection)

AO:

- 2.3.2.2 Some Mission Directorates have chosen to establish several new space flight programs that use a one or two-step Announcement of Opportunity (AO) process to initiate projects. In a one-step AO process, projects are competed and selected for implementation in a single step. In two-step competitions, several projects may be selected in Step 1 and given time to mature their concepts in a funded Phase A before the Step 2 down-selection to one or more projects for further formulation. Program resources are invested (following Step 1 selections) to bring these projects to a state in which their science content, cost, schedule, technical performance, project implementation strategies, safety and mission assurance strategies, and management approach can be better judged. ⁹ These projects are often referred to as *competed* or "*AO-driven*."
- *Footnote 9* From the point of view of the selected AO-driven project, the proposing teams are clearly doing formal project formulation (e.g., putting together a detailed WBS, schedules, cost estimates, and implementation plan) during the funded Phase A concept study and the preparation of the Step 2 proposal. From the point of view of the program, no specific project has been chosen, a FAD is not written, the cost is unknown, and the project-level requirements are not yet identified, yet formulation has begun. The first KDP is the down selection process, and following selection, the process becomes conventional.

Requirements During Phase B (see section 4.5)

- ...⁽⁵⁾ Develop, document, and maintain a project Integrated Baseline for all work performed by the project noting the following:
 - (i) The project's Integrated Baseline is consistent with the NASA standard space flight project WBS (see Appendix G) and has an associated WBS dictionary.
 - (ii) The project's Integrated Baseline includes the integrated master schedule, baseline life-cycle cost estimate, workforce estimates, and the PDR-technical baseline, all consistent with the program requirements levied on the project.
 - (iii) The baseline life-cycle cost estimate is based on the PDR-technical baseline and integrated master schedule and is expected to include a review of the entire scope of work with a series of in-depth assessments of selected critical work elements of the WBS prior to and following the project's PDR/NAR preceding KDP C. (Note: The CADRe is updated to reflect changes.)
 - (iv) The baseline life-cycle cost estimate uses the latest available full-cost accounting initiative guidance and practices.
 - (v) The baseline life-cycle cost estimate includes reserves, along with the level of confidence estimate provided by the reserves based on a cost-risk analysis.
 - (vi) The baseline life-cycle cost estimate is time-phased by Government Fiscal Year (GFY) to WBS Level 2.
- (6) Reconcile (i.e., explain any significant differences) the project's baseline life-cycle cost estimate with the PDR/NAR Independent Cost Estimate.**

Nov 23, 2010 Scolese Letter



- At KDP-C
 1. Tightly coupled programs and projects must develop and provide the following:
 - a. **A program or project-generated cost-and/or resource-loaded development schedule and a probability calculation of meeting both the cost and development schedule targets, also called a Joint Cost and Schedule Confidence Level (JCL);**



SPD 19

June 18, 2010

Meeting the 70% JCL Requirement in PI-led Missions

Executive Summary:

- (a) In the proposal at KDP-A (selection for one step selections) and **in the Concept Study Report (CSR) at KDP-B (downselection for two step selections), the PI commits to a mission cost commitment** which is at or below the AO-specified cost cap. (Section 1(c))
- (b) **The budget and schedule for the project will be baselined at KDP-C.** The PI's cost commitment is still valid and does not go away at KDP-C even though the Commitment Baseline (at 70% joint confidence level) may be higher than the PI's cost commitment. (Section 3(b), Section 3(f))
- (c) SMD considers provision of UFE funds to the project beyond the Management Baseline to constitute an overrun of the PI's cost commitment. (Section 3(g))

Background:

1. Background

- (a) NASA requirements state that programs and projects must have sufficient cost and schedule reserves at Key Decision Point C (KDP-C) to ensure success. NM 7120-81 (NPR 7120.5D NID), Section 2.1.8.2, defines the project Management Baseline, Unallocated Future Expenses (UFE), and the project Commitment Baseline (which is the Management Baseline plus any Unallocated Future Expenses). NM 7120-81 requires programs to have a Commitment Baseline set at a 70% joint confidence level, and it requires projects to have a Commitment Baseline consistent with the program's joint confidence level.
- (b) SMD's competitively-selected, PI-led missions are generally projects in uncoupled programs (e.g. Explorer, Discovery, New Frontiers, etc.). For an uncoupled program to maintain a Commitment Baseline at the 70% joint confidence level, each of the projects must also maintain a joint confidence level at or near 70%.
- (c) SMD Announcements of Opportunity (AOs) set a cost cap for competitively-selected, PI-led mission proposals. The cost cap is restated, if necessary, in the Guidelines for Phase A Concept Study Reports. In the proposal at KDP-A (selection for one step selections) and in the Concept Study Report (CSR) at KDP-B (downselection for two step selections), **the PI commits to a mission cost commitment which is at or below the AO-specified cost cap.**



Meeting the 70% JCL Requirement in PI-led Missions

Background:

1. Background

- (d) After consultation with the PI, the cost commitment may be adjusted by SMD during development to accommodate changes.
- (e) It is generally the case that the project design maturity is insufficient to determine the 70% joint confidence level for cost and schedule at either KDP-A or KDP-B. The agreed-to PI-led mission cost commitment, which includes appropriate cost and schedule reserves for the planned mission, may or may not be at a 70% joint confidence level.

Policy:

- (a) The project (as referenced in NM 1720-81) is the PI-led mission. The program (as referenced in NM 1720-81) is the loosely coupled, multi-mission program, which includes PI-led missions, other projects, and a future mission budget.
- (b) The budget and schedule for the project will be baselined at KDP-C. A joint cost and schedule estimate will be developed by the project, and assessed by the Standing Review Board, prior to KDP-C. Additional independent cost and schedule estimates may be conducted.
- (c) At KDP-C, the Management Baseline will be the PI-led mission cost commitment as proposed in the proposal or CSR and as adjusted by SMD. The Management Baseline is the project budget that is provided to the PI-led project and the implementing Center. The PI and the implementing Center commit to SMD to execute the project within the approved Management Baseline, so the Management Baseline budget approved at KDP-C becomes the PI-led mission cost commitment.
- (d) One of the decisions associated with KDP-C approval is identification of sufficient cost reserves (UFE) that, if needed, can supplement the Management Baseline budget and satisfy the Agency JCL requirements. As discussed in Section 1, SMD generally sets the Commitment Baseline budget to be at or near the 70% joint confidence limit. SMD and the Agency commit to

Congress to execute the project within the approved Commitment Budget.

- (e) The identified UFE that constitute the difference between the mission cost cap and the 70% confidence limit will be held by SMD at Headquarters in the project's budget line. UFE will not be provided to the project, nor will they be used to increase the PI-led mission cost commitment beyond the project's Management Baseline budget, without approval by the SMD Directorate

Program Management Council.

- (f) The PI's cost commitment is still valid and does not go away at KDP-C even though the Commitment Baseline (at 70% joint confidence level) may be higher than the PI's cost commitment.
- (g) SMD considers provision of UFE funds to the project beyond the Management Baseline to constitute an overrun of the PI's cost commitment.
- (h) The Agency considers provision of additional funds to the project beyond the Commitment Baseline to constitute a breach of the Agency's cost commitment.

SMD Handbook



5.5.1: ...With this input, the SMD PMC assesses the mission’s prospect of being able to meet the science objectives on schedule and within budget and documents the results, actions and recommendations to the SMD AA in the Decision Memorandum. The SMD AA decides whether to authorize project transition to Implementation, if Category 2 or 3, or to allow the project to proceed to the Agency PMC for final approval, if Category 1. With the SMD AA’s “confirm” decision to proceed, the SMD AA signs the PLRA if there are no outstanding items in the PLRA and if the PLRA has not already been approved. The DPMC members sign the Decision Memorandum (before the meeting adjourns, if possible)

...A “no confirmation” decision by the SMD AA at the CR or a non-approval from the APMC can direct the project back to the Center for further Formulation, or it can terminate any further effort. This decision is documented in the Decision Memorandum or in a letter drafted by the PE for SMD AA signature. Changes in budget or in strategic plan criteria used to assess the project, or changes within the program or project that violate the original approval criteria, could necessitate reformulation and reevaluation for re-baselining or cancellation. The project returns to Formulation, addressing whatever deficiencies are identified as the rationale for not proceeding to Implementation. If cancellation is the chosen option, the PE should ensure that all appropriate stakeholders are notified and that the appropriate lessons learned are captured in an archive such as the on-line Lessons-Learned Information System.

5.4.3.2 NASA HQ Policy Decisions/Actions during Phase B

A project performs many activities during Phase B leading to a mission preliminary design. These activities are covered by Center processes, and include those required by NPR 7120.5. This handbook is HQ-oriented and describes HQ personnel responsibilities during Phase B. The PE, working in close coordination with the PS and the Program Manager, should verify that the following key decisions are made and actions completed:

- **Ensure completion of a detailed project cost estimate and an independent cost estimate and that those estimates are reconciled to achieve a thorough understanding of expected costs, cost assumptions and risks.**
- Decide what mission cancellation criteria are to be placed into the Program Plan.
- Determine, in consultation with the Program and Project Managers, what technology can be used for the project, based on critical need, risk, TRL, and mission criticality. Determine whether the technology is mission enabling or mission enhancing.

5.4.3.3 Preparation for Approval (NAR/KDP-C)

The PE works with the Program Office and the project to organize and conduct the Confirmation Process for KDP-C, which is the SMD process for Approval of science projects to transition from Formulation to Implementation. The PE verifies that the necessary tasks and proper documentation has been accomplished during Phase B. In addition, the PA&E office requires an update to the CADRe document for Category-1 and -2 projects at KDP-C. From project reviews, project documentation, and consultation with the Program Manager, the PE assesses whether or not the project has completed the Formulation objectives to the point of readiness to begin detailed design and that development within the anticipated cost and schedule continues to be viable. If, through this analysis, and after consultation with the cognizant DD, PS, and Program Manager, the PE determines the project is not ready, he/she will recommend the project continue further formulation. With a decision that the project is ready to transition, the PE initiates and coordinates the approval activity. Approval for Implementation is discussed in Section 5.5, “Approval Subprocess (Phase B to C Transition).”



5.4.2 PI Mission Cost

For a SMEX, the PI Mission Cost is limited to \$105 million in FY 2008 dollars, including funding for all phases and all elements (e.g., Phase A through Phase F, any GFE except standard launch services, implementation of the E/PO program, mission operations and data analysis, safety reliability and quality assurance activities, and reserves). The proposer may distribute the funds among these elements as best suits the investigation.

4.2 General Program Constraints and Guidelines

...

In accordance with NASA's policy of assigning program management responsibility to its Centers, NASA's Goddard Space Flight Center (GSFC) has been assigned program management responsibility for the Explorer Program. In this role, which is separate from its role as a possible partner in the investigation, GSFC is responsible for NASA's fiduciary responsibility to ensure that Explorer missions are achieved in compliance with the cost, schedule, performance, reliability, and safety requirements committed to by the PI.

...

Once an investigation has been selected for flight, failure to maintain reasonable progress on an agreed upon schedule, or failure to operate within the cost and other constraints outlined below, or failure to be able to meet the mission's technical objectives may be cause for its termination by NASA. Every aspect of a selected investigation must reflect a commitment to mission success while keeping total costs as low as possible. Consequently, investigations should be designed and planned to emphasize mission success within cost and schedule constraints by incorporating sufficient margins, reserves, and resiliency. Only those investigations whose proposed cost, schedule, and launch vehicle requirements do not exceed the constraints and guidelines identified in this AO will be considered as candidates for selection for flight.

7120 NID – 97 (Valid at KDP-C)



From the Definitions:

Decommissioning. The process of ending an operating mission and the attendant project as a result of a planned end of the mission or project termination. Decommissioning includes final delivery of any remaining project deliverables, disposal of the spacecraft and all its various supporting systems, closeout of contracts and financial obligations, and archiving of project/mission operational and scientific data and artifacts. Decommissioning does not mean that scientific data analysis ceases, only that the project will no longer provide the resources for continued research and analysis.

Termination Review. A review initiated by the Decision Authority for the purpose of securing a recommendation as to whether to continue or terminate a program or project. Failing to stay within the parameters or levels specified in controlling documents will result in consideration of a termination review.

From the Program Plan Template:

Program Requirements on Projects. For each project, provide a top-level description, requirements. For science missions, include both baseline science requirements and threshold science requirements. (See Appendix A for definitions.) Identify the mission success criteria for each project based on the threshold science requirements. State each requirement in objective, Preliminary Design Review (PDR), Critical Design Review (CDR), launch, mission operationalcritical milestones, and the planned decommissioning date. State the development and/or total life cycle cost constraints on the project. **Set forth any budget constraints by fiscal year. State the specific conditions under which a project Termination Review would be triggered.** Describe any additional requirements on the project (e.g., international partners). If the mission characteristics indicate a greater emphasis is necessary on maintaining technical, cost, or schedule, then identify which is most important (e.g., state if the mission is cost capped; or if schedule is paramount, as for a planetary mission; or if it is critical to accomplish all of the technical objectives, as for a technology demonstration mission).

7120 NID – 97 (Valid at KDP-C)



Program plan Template Section 3.1 Program Control Plans

(...my computer is doing weird things with cut and past)...and document how the measures are traced from the program high-level requirements. Establish baseline and threshold values for the performance metrics to be achieved at each Key Decision Point (KDP), as appropriate. In addition, document the mission success criteria associated with the program-level requirements that, **if not met, trigger consideration of a Termination Review**. Review Plan from the template Identify any deviations from these documents that the program is planning. Provide the technical, scientific, schedule, cost, and other criteria that will be utilized in the consideration of a Termination Review.

From the Project Plan Template

Project Plan section 3.1 Control Plans

Describe the projects performance measures in objective, quantifiable, and measurable terms and document how the measures are traced from the program requirements on the project. **In addition, document the minimum mission success criteria associated with the program requirements on the project, that if not met, trigger consideration of a termination review.**

Project Plan Template Section 3.10 Review Plan

Identify any deviations from these documents that the project is planning. Provide the technical, scientific, schedule, cost, and other criteria that will be utilized in the consideration of a Termination Review.

2.4.2 All programs and projects develop cost estimates and planned schedules for the work to be performed in the current and following life cycle phases (see Appendix C tables). As part of developing these estimates, the program or project shall document the basis of estimate.

NOTE: The requirement for ICE's and reconciliation of ICE's was intentionally removed from NID-97. Independent Cost Assessments of the project's estimate /JCL are required.

GEMS

Charter



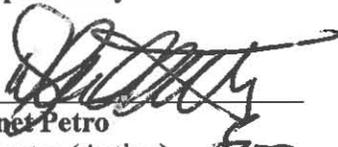
Office of Evaluation

Charter for the Assessment Panel

Gravity and Extreme Magnetism Small Explorer (GEMS) Non-Confirmation Analysis

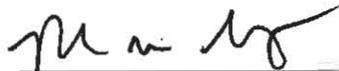
July 9, 2012

Approved by:



Janet Petro
Director (Acting)
Office of Evaluation
NASA Headquarters

Concurred by:



Robert Lightfoot
NASA Associate Administrator
NASA Headquarters



Mr. David Radzanowski
Chief of Staff for NASA Administrator
NASA Headquarters



Assessment Chair
Thomas Irvine
Deputy Associate Administrator, Aeronautics Research
NASA Headquarters

**Office of Evaluation
GEMS Non-Confirm Assessment**

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**Office of Evaluation
GEMS Non-Confirm Assessment**

Background

The Gravity and Extreme Magnetism Small Explorer (GEMS) was awarded as part of the Announcement of Opportunity for Small Explorers (SMEX) issued September 28, 2007 with two launch windows. Each proposer was to propose a Launch Readiness Date for the 1st and 2nd launch slots

- 1st launch No Earlier Than (NET) than Dec 2012
- 2nd launch NET April 2014 and No Later Than (NLT) Sept 30, 2015

GEMS was selected as the 2nd SMEX starting on November 2010 with a proposed Launch Readiness Date of April 3, 2014. The project was notified that they were in the 2nd launch slot during Step 2, after submitting the Concept Study Report (CSR) Proposal. The Science Mission Directorate (SMD) non-confirmed GEMS during the Directorate Program Management Council (DPMC) GEMS confirmation review (KDP-C) held in May 2012. Senator Mikulski requested a review of the GEMS non-confirmation decision in a letter dated June 19, 2012 to the NASA Administrator.

Purpose

The purpose of this review is to provide an assessment of the GEMS non-confirmation decision addressing items referenced in the June 19, 2012 letter to the NASA Administrator from Senator Mikulski. The assessment shall evaluate the justification and the process for the non-confirmation decision. The assessment will result in findings as to the validity of the process used to make the GEMS non-confirmation decision in terms of that processes consistency with applicable guiding/controlling documents. Based on those findings, a recommendation will be made as to whether or not the process upon which the non-confirmation decision was made was appropriate.

Scope of Work

The assessment shall be focused in the following three areas:

1. The justification and process for cancelling GEMS
2. The cost to finish GEMS versus cost to terminate GEMS and store any incomplete or prototype hardware
3. The impact of cancellation on future NASA launch costs

This assessment is not intended to reproduce the technical/cost/schedule/risk analysis already performed by the Mission Directorate, Astrophysics Division, Explorers Program Office at GSFC, GEMS project, or independent assessment panels i.e. SRB and Aerospace Corp. Rather, it is to review and assess the existing data for consistency and compliance to applicable Government requirements for non-confirming the project. In essence, this assessment will attempt to answer the question, “were the data that would have been required to make the non-confirmation decision available to the decision makers at the time of the Science Mission Directorate’s Program Management Council.” The assessment will consider the cost to finish GEMS versus the cost to terminate the project and to subsequently store incomplete hardware, prototypes, and other related equipment. This will include reviewing the impacts and plans for

Office of Evaluation
GEMS Non-Confirm Assessment

storage and/or reuse of residual hardware, to the extent that such hardware exists, as a result of non-confirmation:

Approach

The assessment panel will review SMD's non-confirmation justification and supporting documentation to determine the level of consistency between the stated non-confirmation rationale and supporting detail. The assessment panel will also review the process for non-confirming an Explorer SMEX program taking into account the Announcement of Opportunity for Small Explorers (SMEX) issued September 28, 2007, SMD processes, and Government requirements.

The assessment panel will document the estimated costs to complete GEMS using the independent review team results (SRB) and compare the difference between continuation costs versus estimated termination liability costs. Termination liability costs include cost for terminating contracts and storing residual hardware as a result of non-confirming GEMS. The assessment panel will also review plans for reuse of the GEMS hardware to the maximum extent practical.

The assessment panel will work with the NASA Launch Services Program (LSP) to assess potential impacts of cancelling GEMS on future launch vehicle needs and costs for projected NASA missions, especially in the small payloads class. The LSP and the assessment panel will use the 2012 Agency Mission Planning Model (AMPM) as a guide for projected future NASA missions that would use a launch vehicle of the capability necessary to launch GEMS. LSP will be tasked to provide any additional launch vehicle projected needs not covered in the 2012 AMPM that are relevant due to the non-confirmation of GEMS. LSP will also be tasked to provide any documented launch vehicle provider on and off ramp projections that could be impacted by a non-confirmation of GEMS.

The mechanics of conducting the evaluation will be conducted as follows:

- Collect and organize all applicable existing program/project data; may be done with the assistance of the IPAO/CAD
- The assessment panel will review and evaluate the existing program/project data
- The Assessment panel will hold face-to-face meetings with the Science Mission Directorate, the Explorer Program, the GEMS project, and the SRB, as necessary. These meetings are for the purpose of ensuring that all pertinent existing data is available to the review team and for getting answers to clarifying questions. [NOTE: only existing GEMS data should be used for the GEMS specific portion of the review since this is a process-centered assessment.]

**Office of Evaluation
GEMS Non-Confirm Assessment**

- The assessment panel team develops a summary package to include as a minimum a presentation of their findings, recommendations and open questions with a corresponding white paper, if necessary, for explanatory/clarification purposes
- Hold a face-to-face debriefing meeting with SMD, the Explorer Program, and the GEMS project and its SRB. Attendance will be limited to those organizations that provided data to the assessment panel. The assessment panel will caucus afterwards to discuss and to amend their findings and recommendations, if necessary, based on these debriefs
- The assessment panel presents their findings and recommendations to the Associate Administrator and to the Chief of Staff

Resources Required (personnel, contractors, funds, material)

Panel Members:

OoE:	Helen Grant (assessment oversight)
Chair:	Thomas Irvine
OCE:	Sandra Smalley
HEOMD Budget Office:	Nancy Hammell
LaRC:	Frank Peri
OSMA:	Deirdre Healey
OCS:	Gale Allen

Supporting members:

- IPAO/CAD: Rick Greathouse (initial data collection and independent process assessment monitoring)
- LSP: Jim Nelson, Anne Sweet, Amanda Mitskevich (for assessment of the impact of cancellation on future NASA launch costs)

No contractor personnel are required to support the panel; no funds or materials will be required

Other Factors to consider

GEMS launch vehicle procurement was active at the time of the SMD non-confirmation decision. This procurement activity is on hold, but not cancelled. Accordingly, all launch vehicle related discussions and documentation pertaining specifically to a potential GEMS launch vehicle will be treated as procurement sensitive.

Final Report

PPT presentation with supporting white paper for clarification purposes, if needed

**Office of Evaluation
GEMS Non-Confirm Assessment**

Report Out

Panel reports to the NASA AA and the Agency Chief of Staff

Timeline of activities

- | | |
|--|--------------------|
| 1. Panel notification and commitment | 7/05/12 |
| 2. Data gathering /analysis | 7/9/12 to 7/13/12 |
| 3. Kick-off meeting - Assessment panel | 7/10/2012 |
| 4. SMD, Explorer, GEMS face-to-face mtgs | 7/18/12 – 7/20/12 |
| 5. Brief out to SMD/GEMS/SRB | 7/23/12 |
| 6. Report out to AA/CoS | 7/24/12 or 7/25/12 |

NASA Administrator Bolden

Letter



National Aeronautics and Space Administration
Office of the Administrator
Washington, DC 20546-0001



June 28, 2012

The Honorable Barbara A. Mikulski
Chairwoman
Subcommittee on Commerce, Justice,
Science, and Related Agencies
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Chairwoman:

In response to your letter of June 19, 2012, regarding NASA's decision to not confirm the Gravity and Extreme Magnetism Small Explorer (GEMS) mission to proceed to development, I am writing to inform you that NASA will undertake an independent assessment of the decision regarding GEMS. This independent assessment will be targeted for completion no later than July 27 and will report to Associate Administrator Robert Lightfoot. The independent assessment will evaluate the items outlined in your letter.

I expect the formal charter for the assessment to be finalized in the near future, and the chair and team that will support the assessment to be designated in the near future as well. I will ensure that this information is provided to you as soon as possible.

I look forward to working with you on this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "C. Bolden, Jr.", with a long horizontal flourish extending to the right.

Charles F. Bolden, Jr.
Administrator

Chairwoman Mikulski

Letter



DANIEL K. INOUE, HAWAII, CHAIRMAN
THAD COCHRAN, MISSISSIPPI, VICE CHAIRMAN

PATRICK J. LEAHY, VERMONT
TOM HARKIN, IOWA
BARBARA A. MIKULSKI, MARYLAND
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JOHN HOEVEN, NORTH DAKOTA
RON JOHNSON, WISCONSIN

CHARLES J. HOUY, STAFF DIRECTOR
BRUCE EVANS, MINORITY STAFF DIRECTOR

United States Senate

COMMITTEE ON APPROPRIATIONS

WASHINGTON, DC 20510-6025

<http://appropriations.senate.gov>

June 19, 2012

The Honorable Charles F. Bolden, Jr.
Administrator
National Aeronautics and Space Administration
300 E Street, SW
Washington, DC 20546

Dear Administrator Bolden:

I understand that NASA intends to cancel the Gravity and Extreme Magnetism Small Explorer (GEMS). Such a cancellation is subject to the notification requirements of section 505 of Public Law 112-55. This letter is to request an independent analysis of NASA's proposal to cancel GEMS. I request you submit this analysis, which should be conducted independent of the Science Mission Directorate, along with any request under section 505 to cancel GEMS.

The analysis, at a minimum, should evaluate: (1) the justification and process for cancelling GEMS; (2) the cost to finish GEMS versus cost to terminate and store any incomplete hardware or prototypes; and (3) the impact of cancellation on future NASA launch costs.

Thank you in advance for your prompt response to this request. If you have any questions about this request, please contact Jean Toal Eisen of my staff at (202) 228-3449.

Sincerely,



Barbara A. Mikulski
Chairwoman
Subcommittee on Commerce, Justice,
Science and Related Agencies